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UNIVERSITY OF SOUTHAMPTON

FACULTY OF HUMANITIES

School of Modern Languages

**Second Language Acquisition of Pronominal Binding
by Learners of Korean and English**

by

Hee-Jeong Song

Thesis for the degree of Doctor of Philosophy

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UNIVERSITY OF SOUTHAMPTON

ABSTRACT

FACULTY OF HUMANITIES

School of Modern Languages

Doctor of Philosophy

SECOND LANGUAGE ACQUISITION OF PRONOMINAL BINDING

BY LEARNERS OF KOREAN AND ENGLISH

by Hee-Jeong Song

This thesis presents a new study on the L2 acquisition of pronominal binding in Korean and English in order to examine accessibility to Universal Grammar (UG) (Chomsky 1981, 1986, 2000, 2001) in adult L2 acquisition. Specifically, the study examines the L2 acquisition of grammatical knowledge of the Overt Pronoun Constraint (OPC) (Montalbetti 1984) by English learners of Korean and the L2 acquisition of anaphoric binding by Korean learners of English.

The first study investigates L2 speakers' knowledge of the OPC, typically regarded as a universal constraint and a poverty-of-the-stimulus phenomenon. Previous L2 acquisition studies have only explored OPC effects when the pronoun is in subject position but not in object position. The current study aims to address this gap by investigating whether English learners of Korean can obtain nativelike knowledge of the OPC in subject and object positions. 41 English learners of Korean (intermediate and advanced) completed a co-reference comprehension task and a story-based translation task. Results from the experiment show that L2 speakers can successfully achieve nativelike knowledge of the OPC regardless of pronoun position and the study confirms the prediction that universal constraints need not be learnt.

The second study focuses on L2 speakers' knowledge of feature-based language-specific constraints of anaphoric binding, following Hicks (2009), to examine the L2 acquisition of locality and orientation. 70 Korean learners of English (low-intermediate, intermediate, and advanced) completed a picture verification task and the results show that neither locality nor orientation constraints are properly acquired by most learners. This finding reveals that L2 speakers have difficulty in acquiring new feature

configurations of the target grammar. This study also provides new evidence to support the view that cross-linguistic differences in this domain are derived from the interaction between language-specific feature specifications and universal reflexivisation mechanisms.

In accordance with the results from the two studies, this thesis argues that while UG plays a significant role in explaining L2 speakers' convergence to the L2 grammar, consistent with Full Access to UG (Schwartz & Sprouse 1994, 1996), divergence in L2 acquisition is caused by a failure to reconfigure new feature specifications. This is a result which supports the relevant role that Feature Assembly plays in second language acquisition (Lardiere 2008, 2009).

LIST OF CONTENTS

ABSTRACT	i
LIST OF CONTENTS	iii
LIST OF FIGURES	vii
LIST OF TABLES	viii
DECLARATION OF AUTHORSHIP	xi
ACKNOWLEDGEMENTS	xii
LIST OF ABBREVIATIONS	xiv
 Chapter 1: Introduction	 1
1.1 Theoretical background of the study	2
1.2 The empirical studies	7
1.2.1 The study of the Overt Pronoun Constraint in L2 acquisition	7
1.2.2 The study of the L2 acquisition of anaphoric binding	10
1.3 Rationale of the study and research questions	11
1.4 The findings	14
1.5 Significance of the study	15
1.6 Organisation	16
 Chapter 2: Linguistic theory and second language acquisition	 18
2.1 Development of the theory of Principles and Parameters of Universal Grammar	18
2.1.1 The theory of Principles and Parameters in the GB framework	18
2.1.2 The theory of Principles and Parameters in the Minimalist Program	21
2.1.3 The role of formal features	24
2.1.4 The process of language acquisition in the Minimalist Program	25
2.1.5 Section summary	27
2.2 L2 acquisition in the generative tradition	28
2.2.1 Understanding a poverty-of-the-stimulus in L2 acquisition	28
2.2.2 Development of L2 acquisition within the generative linguistics	30
2.2.3 Recent approaches to L2 acquisition research	34
2.2.3.1 The Failed Functional Features Hypothesis	34
2.2.3.2 The Full Transfer/Full Access Hypothesis	39
2.2.3.3 The Feature Assembly Hypothesis	42

2.2.4	Section summary.....	45
2.3	Summary of Chapter 2.....	45
Chapter 3:	The Overt Pronoun Constraint in L2 acquisition	47
3.1	The distribution of overt and null pronouns	47
3.2	The Overt Pronoun Constraint.....	51
3.3	The Overt Pronoun Constraint in Korean.....	54
3.3.1	The Overt Pronoun Constraint in subject position.....	54
3.3.2	The Overt Pronoun Constraint in object position	57
3.4	Previous L2 acquisition studies of the Overt Pronoun Constraint	66
3.4.1	Kanno (1997)	66
3.4.2	Pérez-Leroux & Glass (1999)	70
3.4.3	Rothman & Iverson (2007a, b) and Rothman (2009)	72
3.4.4	Gürel (2003, 2006).....	75
3.4.5	Summary of the L2 acquisition studies of the OPC: Universal property of the OPC	78
3.5	Summary of Chapter 3.....	80
Chapter 4:	Anaphoric binding in L2 acquisition	82
4.1	Binding Theory in the GB framework.....	83
4.2	Morphological characteristics of Korean reflexives.....	87
4.3	Binding differences between English and Korean	89
4.4	Nonlocal binding in the GB framework	92
4.4.1	The parameterised binding theory	93
4.4.2	The movement at LF approach	96
4.4.3	The relativized SUBJECT approach.....	98
4.4.4	The non-syntactic approaches.....	100
4.4.5	Section summary.....	101
4.5	Binding in Minimalism.....	102
4.6	Defining the featural composition of Korean reflexives	105
4.6.1	Korean nonlocally bound reflexive <i>caki</i>	106
4.6.2	Korean locally bound reflexive <i>caki-casin</i>	112
4.6.3	Section summary.....	115
4.7	Previous L2 acquisition studies of reflexive binding	117
4.7.1	Overview	117
4.7.2	L2 acquisition studies under the parameterised binding approach	121

4.7.3	L2 acquisition studies under the LF movement approach	126
4.7.4	L2 acquisition studies under the relativized SUBJECT approach	130
4.7.5	Other L2 acquisition studies of reflexive binding	132
4.8	Summary of Chapter 4	135
Chapter 5: A study of the Overt Pronoun Constraint in L2 acquisition		138
5.1	Research questions	138
5.2	Hypotheses	140
5.3	Participants	140
5.4	Methodology	142
5.4.1	Task 1: The co-reference comprehension task	142
5.4.2	Task 2: The story-based translation task	146
5.5	Procedures	151
5.6	Results of the co-reference comprehension task	152
5.6.1	Group results	152
5.6.1.1	Group results of Type 1 to Type 4	152
5.6.1.2	Group results of Type 5 to Type 8	159
5.6.2	Individual results	165
5.6.3	Summary of the comprehension task data	169
5.7	Results of the story-based translation task	170
5.7.1	Group results	170
5.7.1.1	Results of Type 1 and Type 2	172
5.7.1.2	Results of Type 3 and Type 4	175
5.7.2	Individual results	178
5.7.3	Summary of the translation task data	181
5.8	Summary and discussion	182
Chapter 6: A study of the L2 acquisition of anaphoric binding		189
6.1	Research questions	190
6.2	Hypotheses and predictions	192
6.3	Participants	195
6.4	Methodology	196
6.4.1	Task: The picture verification task	196
6.4.2	Constructing test sentences	199
6.5	Procedures	203
6.6	Results	204

6.6.1	Group results in locality	204
6.6.2	Group results in orientation	210
6.6.3	Summary of the group results in locality and orientation	213
6.6.4	Individual results	215
6.7	Summary and discussion	219
Chapter 7: Summary, Implications, and Conclusion		225
7.1	The study of the Overt Pronoun Constraint in L2 acquisition	226
7.1.1	Summary of findings	226
7.1.2	Implications and limitations of the OPC study	227
7.2	The study of the L2 acquisition of anaphoric binding	229
7.2.1	Summary of findings	229
7.2.2	Implications and limitations of the study of anaphoric binding	231
7.3	Implications for current L2 acquisition theory	233
7.4	Conclusion	236
Appendices		238
Appendix 1: Language background information for the task of the OPC		238
Appendix 2: The co-reference comprehension task for the study of the OPC		239
Appendix 3: The story-based translation task for the study of the OPC		247
Appendix 4: Language background information for the study of anaphoric binding ..		252
Appendix 5: The picture verification task for the study of anaphoric binding		253
Appendix 6: Individual results of the co-reference comprehension task for the OPC		264
Appendix 7: Individual results of the story-based translation task for the OPC		270
Appendix 8: Individual results of the picture verification task for anaphoric binding		273
Appendix 9: Percentage of target responses for locality and orientation for each low-intermediate learner		277
Appendix 10: Percentage of target responses for locality and orientation for each intermediate learner		278
Appendix 11: Percentage of target responses for locality and orientation for each advanced learner		279
Bibliography		280

LIST OF FIGURES

Figure 1: The architecture of grammar in the Minimalist Program	25
Figure 2: The process of language acquisition in the Minimalist Program	26
Figure 3: The results of Type 1 to Type 4 in the comprehension task.....	154
Figure 4: The results of Type 1 (QDP/overt subject) in the comprehension task.....	154
Figure 5: The results of Type 5 to Type 8 in the comprehension task.....	161
Figure 6: The results of Type 5 (QDP/over object) in the comprehension task	161
Figure 7: The rates for the use of null/ <i>caki</i> across sentence types in the translation task	172
Figure 8: The rates for the use of overt and null/ <i>caki</i> in Type 1 (bound reading for a subject pronoun with a QDP matrix subject) in the translation task.....	173
Figure 9: The rates for the use of overt and null/ <i>caki</i> in Type 3 (bound reading for an object pronoun with a QDP matrix subject) in the translation task	175
Figure 10: Across-group comparisons for percentages of local binding in locality	205
Figure 11: The percentage of responses of Type 1 sentences by all groups	205
Figure 12: The percentage of responses of Type 2 sentences by all groups	205
Figure 13: Across-group comparisons for percentages of target responses in orientation	210

LIST OF TABLES

Table 1: Acceptance rates of overt and null selected in Kanno (1997)	67
Table 2: Percentages of overt, null, and other responses produced in Pérez-Leroux & Glass (1999).....	71
Table 3: The results of the written interpretation task in Gürel (2006)	76
Table 4: Different morphological forms of reflexives in Korean	87
Table 5: Morphological distinction between simplex and complex reflexives in Korean...	88
Table 6: Locality and orientation constraints.....	92
Table 7: Syntactic and semantic properties of Korean and English reflexives.....	117
Table 8: Percentages of responses by English controls and East-Asian L2 speakers regarding orientation in previous studies.....	119
Table 9: Percentages of responses by Chinese or Japanese controls and English L2 speakers regarding locality in finite clauses in previous studies	119
Table 10: Previous L2 acquisition studies of reflexive binding.....	134
Table 11: The participants' language background information	141
Table 12: Different quantifiers used in the comprehension task	144
Table 13: Type of sentences used in the comprehension task	144
Table 14: Sentence types and possible translation in the translation task	149
Table 15: Acceptance rates of overt and null forms in embedded subject position with QDP and RDP contexts (Type 1 to Type 4)	153
Table 16: The results of <i>t</i> -test on the selection for bound/both readings within each group in the comprehension task (Type 1 vs. Type 2, Type 1 vs. Type 3).....	157
Table 17: The comparisons of acceptance rates of bound or both readings across different sentence types by native controls in previous OPC studies	159
Table 18: Acceptance rates of overt and null forms in embedded object position with QDP and RDP contexts (Type 5 to Type 8)	160
Table 19: The results of <i>t</i> -test on the selection for bound/both readings within each group in the comprehension task (Type 5 vs. Type 6, Type 5 vs. Type 7).....	162
Table 20: OPC violations in three different QDPs/ <i>wh</i> -words.....	165
Table 21: Consistency rates with which a disjoint reading only was selected at least five out of six tokens in Type 1 and Type 5 sentences	166

Table 22: The number of times that a bound reading was selected in Type 1 and Type 5 by native speakers of Korean (n=20).....	167
Table 23: The number of times that a bound reading was selected in Type 1 and Type 5 by intermediate learners (n=19).....	168
Table 24: The number of times that a bound reading was selected in Type 1 and Type 5 by advanced learners (n=22).....	168
Table 25: Percentages of responses across sentence types by experimental groups in the translation task	170
Table 26: Percentages of the correct responses (null pronoun or <i>caki</i>) by experimental groups in Type 1 and Type 3 in the translation task	171
Table 27: The within-group comparisons for production of the overt subject pronoun between Type 1 and Type 2 sentences in the translation task	174
Table 28: The within-group comparisons for production of the overt pronoun between Type 1 and Type 3 sentences in the translation task.....	177
Table 29: The within-group comparisons for production of the overt object pronoun between Type 3 and Type 4 sentences in the translation task	177
Table 30: Percentages with which a target pronoun was elicited at least three out of the four items in Type 1 and Type 3 sentences.....	178
Table 31: The number of times that native speakers of Korean (n=20) produced an overt pronoun in Type 1 and Type 3 sentences	179
Table 32: The number of times that intermediate learners (n=19) produced an overt pronoun in Type 1 and Type 3 sentences.....	180
Table 33: The number of times that advanced learners (n=22) produced an overt pronoun in Type 1 and Type 3 sentences.....	180
Table 34: Summary of background information of L2 learners	196
Table 35: Sentence types and possible antecedents in the picture verification task	201
Table 36: The details of sentence types used in the picture verification task	203
Table 37: Percentages of responses by three Korean L2 groups and an English control group in the reflexive binding task	204
Table 38: The comparisons between Type 1 and Type 2 sentences within groups.....	208
Table 39: Consistency rates with which a local antecedent was selected at least four out of five test items in Type 1 and Type 2 sentences.....	209

Table 40: The comparisons between subject antecedents and object/both (subject/object) antecedents in Type 3 sentences within groups 211

Table 41: Percentages of responses for the five test items in Type 3 sentences 212

Table 42: Frequency and percentages of appropriate locality and orientation responses in six different acquisition contexts 216

DECLARATION OF AUTHORSHIP

I, HEE-JEONG SONG,

declare that the thesis entitled

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and the work presented in the thesis are both my own, and have been generated by me
as the result of my own original research. I confirm that:

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Domínguez, Laura, Hicks, Glyn & Song, Hee-Jeong (2012). Untangling locality and orientation constraints in the L2 acquisition of anaphoric binding: A feature-based approach. *Language Acquisition*, 19(4), 266-300.

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LIST OF ABBREVIATIONS

ACC	accusative case
AGR	Agreement
CAUS	causative
COMP	complementizer
C(omp)	the functional category Complementizer
CP	complementizer phrase
D	the functional category Determiner
DAT	dative
DECL	declarative
GEN	genitive
I(nfl)	the functional category Inflection
IMPERF	imperfect
IP	inflection phrase
LOC	locative
N	noun
NEG	negation
NOM	nominative
NP	noun phrase
PAST	past tense
PL	plural
PNE	prenominal ending
POSS	possessive
PP	prepositional phrase
PRES	present tense
PROG	progressive
Q	question particle
SG	singular
Spec	specifier
T	the functional category Tense
TOP	topic

TP	tense phrase
V	verb
vP	light verb phrase
VP	verb phrase
V2	verb second
V3	verb third

CHAPTER 1

INTRODUCTION

This thesis investigates the question of whether Universal Grammar (UG) plays a role in acquiring linguistic knowledge of a second language. In order to examine this issue, I provide an analysis of pronominal binding in adult second language acquisition within the framework of generative grammar, as developed from the Principles and Parameters (P&P) approach in the Government and Binding (GB) theory (Chomsky 1981, 1986) to the recent version of the Minimalist Program (MP) (Chomsky 2000, 2001). Specifically, this study examines the L2 acquisition of grammatical knowledge of the Overt Pronoun Constraint (OPC) (Montalbetti 1984) by English learners of Korean and reflexive binding by Korean learners of English.

A great deal of research on UG access in L2 acquisition has been conducted mainly within the traditional GB framework. The notion of UG access, however, is treated differently under the view of current developments of the MP. In the Minimalist assumptions, the language faculty contains the features and a universal computational system that manipulates features to construct linguistic expressions, which constitutes Universal Grammar (Chomsky 2000). Consequently, the discussion of the possibility of access to UG in L2 acquisition has moved towards ‘access to features’ available in UG. Aware of the shift that generative linguistic theory has developed, the main goal of the study is to investigate whether adult L2 speakers can ultimately reach nativelike competence pertaining to the OPC and reflexive binding in order to advance our understanding of the status of UG in L2 acquisition.

The remainder of this chapter presents a theoretical background of the study, the empirical studies including the OPC and anaphoric binding, rationale of the study and research questions, findings, significance of the study, and the organisation of the thesis.

1.1 Theoretical background of the study

The theoretical framework adopted in this thesis is Chomsky's UG-based approach. This view proposes that language acquisition is determined by a biologically endowed innate faculty of language. The innate UG is assumed to consist of a universal set of principles and language-specific parameters common to all languages (Chomsky 1981, 1986). Acquiring language in this traditional sense of the GB framework means assigning values to on/off open parameters on the basis of the specific linguistic experience (e.g. Primary Linguistic Data) that the child is exposed to. Therefore, UG allows first language acquirers to have a complete native grammar on the basis of exposure to Primary Linguistic Data (PLD). The current Minimalist account has reanalysed the concept of parameters, and now assumes that cross-linguistic variation arises from differences between formal features of functional categories across languages (e.g. Borer 1984; Chomsky 1995). Functional categories are syntactic units that have a grammatical function such as complementizer (C), inflection (I) and determiner (D). They contain a bundle of formal features associated, for example, with tense, number, person, gender and case, and these feature bundles constitute part of the lexicon of a particular language. Hence, in light of the MP, language is regarded as consisting of a lexicon and a computational system; parametric variation is represented in the lexicon and the computational system which selects from the lexicon is invariant. In this Minimalist approach, the task of language acquisition is reduced to learning formal features associated with lexical items in the grammar. I will come back to the detailed discussion of the role and function of parameters during the theoretical change in Section 2.1. The move from the P&P approach to the MP in generative linguistic theory has led L2 researchers to reassess the concept of parameters and the nature of formal features. Given that parameters are encoded in features in the current generative models of grammar, L2 learning is largely seen as lexical learning of target language, as in native language acquisition.

In generative L2 acquisition (SLA) research, the traditional P&P approach has been widely adopted by existing research in order to examine L2 speakers' mental architecture of grammar. If we assume that the P&P of UG constrain L2 acquisition, potential learnability problems or poverty-of-the-stimulus (POS) phenomena arise. The

arguments of the POS originally stem from the assumption that children's linguistic experience is not sufficient to master a complex system of linguistic knowledge. Generative analyses of language acquisition provide a possible explanation for the fact that children are able to acquire adultlike grammatical competence. It is also well-documented that adult L2 speakers can successfully acquire a particular aspect of a linguistic property (e.g. principles of UG such as the Overt Pronoun Constraint) which is typically regarded as a POS phenomenon.

One of the crucial differences between L1 and L2 acquisition relates to the outcome in the end-state of grammar. Adult L2 speakers often do not appear to reach nativelike levels of attainment where a child acquiring a first language is typically successful. L1-L2 parametric differences thus have been conceived as a primary source of difficulty in L2 acquisition, and learners' divergent outcome from the target grammar is attributed to a failure in resetting parameters of the target grammar (cf. White 2003). If L2 speakers can successfully reset a parameter value of the target language, then this can constitute evidence that UG constrains interlanguage grammars. However, it has also been suggested that failure to acquire L2 parameter setting does not essentially imply that UG is not available (e.g. Hawkins & Chan 1997; Hawkins & Hattori 2006 among others) (see Section 2.2.2 for further discussion).

Under the current linguistic proposal, parametric differences across languages are assumed to be linked to a set of formal features which are assembled within functional categories. In consequence, the important debate in L2 acquisition has revolved around the issue of the source of difficulty for L2 speakers' non-targetlike outcome. The cause of the observed divergence in L2 acquisition has been explained by two different accounts to date. One is a view that argues for a syntactic deficit in L2 grammars due to the failure to acquire new L2 functional features after the critical period (e.g. Hawkins & Chan 1997; Tsimpli 2003; Hawkins & Liszka 2003; Hawkins & Hattori 2006; Tsimpli & Dimitrakopoulou 2007; Tsimpli & Mastropavlou 2008). The other is a view that argues for a deficit in mapping abstract syntactic knowledge across different grammatical modules such as morphology and phonology (e.g. Prévost & White 2000; Lardiere 1998a, b, 2000; Goad & White 2004).

The syntactic deficit approach has suggested that persistent problems are caused by a lack of appropriate functional features in which the syntactic computational system is impaired in adult L2 speakers. For instance, the Failed Functional Features Hypothesis (FFFH) proposed by Hawkins & Chan (1997) has argued that even though grammatical knowledge of L2 is UG-constrained, the acquisition of new functional features of the target grammar is subject to a critical period. This indicates that if target features are not present in the learner's L1, they will not be fully acquired after a certain age. The Representational Deficit Hypothesis (Hawkins & Hattori 2006) and the Interpretability Hypothesis (Tsimplici 2003; Tsimplici & Dimitrakopoulou 2007; Tsimplici & Mastropavlou 2008) are also compatible with the FFFH.

The morphophonological deficit approach is claimed to be a result of the dissociation between surface forms and abstract syntactic features, which is an alternative account to the FFFH. The Missing Surface Inflection Hypothesis (MSIH) (Haznedar & Schwartz 1997; Lardiere 1998a, b, 2000; Prévost & White 1999, 2000) and the Prosodic Transfer Hypothesis (PTH) (Goad, White & Steele 2003; Goad & White 2004, 2006) share the assumption that there is no impairment in the computational system but the problem resides outside the domain of syntax. These hypotheses build on the Full Transfer/Full Access hypothesis (FT/FA) (Schwartz & Sprouse 1994, 1996), according to which L2 speakers' native language is initially carried over to the target language but full access to UG eventually permits them to have nativelike grammar in response to the appropriate input. Crucially, the FT/FA model presupposes that even though L2 speakers' performance is not completely nativelike, this does not mean that their grammar is not UG-constrained.

The two contrasting SLA accounts presented above have equally been discussed substantially in order to provide an explanation of non-targetlike L2 ultimate attainment. In recent years, another proposal suggesting L2 speakers' difficulties with morphosyntax is formalised based on the work of Lardiere (1998a, b, 2000). Lardiere has further proposed the Feature Assembly Hypothesis (FAH) (Choi & Lardiere 2006; Lardiere 2005, 2008, 2009), claiming that the traditional notion of parameters is not sufficient to explain learners' persistent problems in achieving the target grammar. This new approach has been argued for in recent L2 acquisition theory (e.g. Lardiere 2009;

Domínguez, Arche & Myles 2011), and postulates that successful L2 acquisition requires figuring out “*how to reconfigure or remap features into new or different formal configurations in the L2*” (Lardiere 2008: 107). The FAH also assumes the FT/FA (Schwartz & Sprouse 1994, 1996), but this approach is different from the MSIH in that non-convergence in L2 grammars is due to learners’ failure to (re)assemble formal features into the featural composition of functional categories and lexical items. Crucially, Lardiere contends that learners encounter considerable learning difficulties in reconfiguring relevant feature values of the L2. I will present a detailed review of the main generative SLA theories in Section 2.2.3.

As briefly discussed above, L2 acquisition has some areas of similarity and difference with L1 acquisition. Taking these facts into account, this thesis empirically examines the extent to which acquisition of an L2 is similar to (or different from) acquisition of an L1. The focus of the investigation is properties of pronominals– the Overt Pronoun Constraint (OPC) and anaphoric binding– in the two different contexts of L2 acquisition. The pronoun systems of Korean and English radically differ in that Korean extensively allows arguments such as subject and object to remain phonetically unexpressed (i.e. null arguments are occupied by ‘*pro*’), known as a null-subject or a pro-drop language. This syntactic fact has triggered a substantial L2 literature in terms of the null-subject parameter as well as relevant discussions on different types of pronouns which exhibit different referential properties (e.g. Kanno 1997, 1998; Pérez-Leroux & Glass 1999; Marsden 2002a; Lozano 2002; Rothman & Iverson 2007a, b; Rothman 2009). For instance, the use of null and overt pronouns in Korean is determined by a grammatical constraint, namely the OPC (Montalbetti 1984), in quantifier-binding environments. The OPC is claimed to be a linguistic universal that in null-subject languages does not allow a bound variable interpretation in quantified contexts (i.e. the OPC blocks co-reference interpretations between overt embedded pronouns and matrix clausal subjects that are quantified DPs or *wh*-phrases).

Previous L2 studies (e.g. Kanno 1997, 1998; Schwartz 1998; Pérez-Leroux & Glass 1999; Schwartz & Sprouse 2000; Dekydtspotter & Sprouse 2001; Slabakova & Montrul 2003; Slabakova 2006a, b; Rothman & Iverson 2008) strongly argue in favour of the necessity of innate linguistic knowledge which shows the POS phenomenon in L2

acquisition. Investigating POS properties can have an important role in the understanding of accessibility of UG in adult L2 acquisition. Since the OPC is treated as a principle of UG, this is one of the POS phenomena. Much of the L2 work on the OPC has been conducted within the GB framework (e.g. Kanno 1997, 1998; Pérez-Leroux & Glass 1999; Marsden 1998, 2002a; Lozano 2002; Gürel 2003, 2006) and I am not aware of any recent Minimalist treatment of the OPC in L2 acquisition.¹ Therefore, this study will follow a GB analysis of the OPC, which assumes that it is a principle of UG and thus acquisition of the OPC is expected to require access to UG.

In contrast, Minimalist accounts of reflexive binding exist (e.g. Reuland 2001; Heinat 2008; Hicks 2009) as alternative explanations to the classical GB binding theory (Chomsky 1981, 1986). The Minimalist Program (Chomsky 2000, 2001) reanalyses the binding theory in a derivational approach to syntax. In the study of anaphoric binding, I will adopt the current feature-based approach to binding which assumes that binding relations in English are achieved from independent language-specific constraints established by the syntactic operations between anaphors and their antecedents (see Hicks 2009). According to Hicks (2009), anaphoric binding in English can be determined in the computational system through the Agree operation. This author proposes a new feature-based analysis of the binding theory from a Minimalist perspective, arguing that English reflexives possess an unvalued feature which has to be valued via Agree. Previous studies on L2 acquisition of reflexive binding have made use of Condition A based on the binding conditions of Chomsky (1981, 1986) as they were framed in the GB framework, which is regarded to be universally available for all languages (as a universal principle of UG). This assumption, however, cannot be accommodated in the current feature-based account, since the core notions employed in the binding theory (BT) such as governing category and binding domain have been removed in the current Minimalist syntax. Moreover, the binding conditions subsumed under BT have not adequately explained cross-linguistic differences regarding the behaviour of reflexives. One of the benefits of the Minimalist approach to binding is that the canonical binding theory can be completely eliminated as a grammatical module

¹ Rothman & Iverson (2007a, b) and Rothman (2009) have investigated the OPC as one of the cluster of properties in a null-subject parameter. They strongly argue that learners do not ‘acquire’ the OPC but do acquire relevant features that license and identify *pro* in null-subject languages. The authors consequently follow a minimalist analysis of the null-subject parameter but not a minimalist treatment of the OPC itself.

of UG. That is to say, the BT in the grammar disappears under a Minimalist approach since the MP dispenses with a modular organisation of UG. More importantly, under this view, cross-linguistic variation is appropriately explained as arising from different configurations of formal features between languages without resorting to a highly structured and rich UG. This new analysis of anaphoric binding will provide accounts of not only how formal features on reflexive pronouns are structured in the native language and the target grammar, but also why learners show the observed acquisition pattern concerning binding properties.

1.2 The empirical studies

1.2.1 The study of the Overt Pronoun Constraint in L2 acquisition

This thesis will examine learners' grammatical competence of the Overt Pronoun Constraint (OPC), one of the principles of UG and a typical POS phenomenon. In languages like Korean known as null-subject or pro-drop languages, an overt subject pronoun can be either overtly expressed as shown in (1a) or optionally omitted in (1b). However, non-null-subject or non-pro-drop languages like English only allow overt pronouns in sentences such as (2a).

- (1) a. Ku-ka piano-lul yencwuhayssta. (Korean)
 he-NOM piano-ACC played
 ‘He played the piano.’
 b. piano-lul yencwuhayssta.
 piano-ACC played
 ‘(He) played the piano.’
- (2) a. He played the piano. (English)
 b. *Played the piano.

I am interested in the fact that languages such as English and Korean also differ with respect to the interpretation of sentences such as (3) and (4).

- (3) Everyone_i said that he_{i/j} played the piano.
- (4) a. *Motwu_i -nun **ku**_i -ka piano-lul yencwuhayssta-ko malhayssta.
 Everyone_i-TOP he_{*i}-NOM piano-ACC played-COMP said
 ‘Everyone said that he played the piano.’
- b. Motwu_i -nun **ku**_j -ka piano-lul yencwuhayssta-ko malhayssta .
 Everyone_i-TOP he_j-NOM piano-ACC played-COMP said
 ‘Everyone said that he played the piano.’

In pro-drop languages like Korean, an overt pronoun in an embedded clause cannot take a quantified noun phrase (e.g. ‘everyone’, ‘someone’, ‘no one’) or a *wh*-word (e.g. ‘who’, ‘which’) as its antecedent (Hong 1985, 1986; Choe 1988). By contrast, in non-pro-drop languages like English, there is no such restriction as there is no overt vs. *pro* distinction in the grammar. In (3), the pronoun ‘he’ in the embedded clause can be bound to the quantifier ‘everyone’ in the matrix clause. Furthermore, ‘he’ can refer to another person (index ‘j’) outside the sentence. The former is called a *bound variable reading* and the latter is referred to as a *disjoint reading*. However, Korean only permits a disjoint reading for the overt pronoun, as shown in (4b).

The OPC is a principle of grammar that is instantiated in null-subject languages only such as Korean, since its relevance only obtains when the particular grammar instantiates an alternation between null and overt pronominals. In such languages, the OPC blocks a co-referential interpretation between a quantified or *wh*-word matrix subject (i.e. variables) and an embedded overt pronoun. Previous L2 acquisition studies have shown that the OPC is successfully achieved by L2 speakers of Spanish (Pérez-Leroux & Glass 1999; Lozano 2002; Rothman & Iverson 2007a, b; Rothman 2009) and Japanese (Kanno 1997, 1998; Marsden 2002a); however, a similar result was not obtained in the study of L2 speakers of Turkish (Gürel 2003, 2006). What all these studies have in common is that they have concentrated on examining the OPC when the pronoun is in subject position.

By contrast, there are hardly any studies examining the OPC when the pronoun is in object position, as shown in (5).² Interestingly, the OPC can also be applied in object pronoun position in Korean since there is an alternation between overt and null object pronouns.

- (5) Nwukwuna_i-ka Mary-ka **ku***_{i/j}-lul coahayssta-ko malhayssta. (Korean)
 Everyone_i-NOM Mary-NOM him*_{i/j}-ACC love-COMP said
 ‘Everyone said that Mary loved him.’

In the case of the OPC in object position, it is presupposed that the syntactic status of null objects in Korean is analysed as occurrences of *pro* (e.g. Yang 1985, 1988; Cole 1987). If a null object were not a *pro* but a variable bound by a null topic operator like Chinese (e.g. Huang 1984, 1989), then the OPC would not be operative in object position, thereby resulting in a subject-object asymmetry in the acquisition of the OPC. The results of the experimental study of the OPC will be able to provide an appropriate generalisation with respect to the grammatical status of null objects in Korean. Given that a null object is a *pro* in Korean, the investigation of the OPC in object position in this study intends to offer a new piece of evidence of how non-native speakers come to acquire this grammatical domain. By analysing and comparing results from these two structures in the OPC, this study attempts to identify whether L2 speakers obtain knowledge of the OPC, when the pronoun is in subject position as well as in object position.

The main objective of this empirical study is to examine whether the OPC is obtained without problems, as well as the role that UG-based constraints play in L2 acquisition. If we assume that Full Access to UG in second language acquisition is possible (Schwartz & Sprouse 1994, 1996), L2 speakers should be capable of acquiring

² Yamada (2003) has reported a pilot study of the Japanese OPC in object position as well as in subject position, using a comprehension task of Kanno (1997). The participants were 5 native speakers of English, 1 native speaker of Spanish, and 5 Japanese native controls. Although different L1 backgrounds were involved in L2 participants, the author treated them as one L2 group. Since English and Spanish have a different syntactic status regarding overt and null pronouns, it seems that her analysis may have been compromised by this fact. Furthermore, the author’s argument that the OPC in Japanese may not be operative in both subject and object positions is not completely straightforward. In the experiment, the results clearly showed that all Japanese native speakers selected a disjoint reading only in the quantified contexts with an embedded overt subject or object, conforming to the OPC.

nativelike syntactic representations of the target language in this domain. This is because the OPC is a principle of UG and it need not be learnt if access to UG is indeed possible. Full details of this study will be presented in Chapter 5.

1.2.2 The study of the L2 acquisition of anaphoric binding

The second study of this thesis will investigate the acquisition of language-particular restrictions of anaphoric binding in English by a group of Korean speakers. Of particular interest in anaphoric binding is that English and Korean differ with respect to locality and orientation constraints. Unlike English, Korean has reflexives that are nonlocally bound. Thus, in the following Korean example (6a), the reflexive pronoun *caki* can be bound by a long-distance (LD) antecedent ‘Mary’ or by the local antecedent ‘Jane’, whereas in English the reflexive can be bound only by the local antecedent ‘Jane’ as in (6b):

- (6) a. Mary_i -nun Jane_j -i **caki**_{i/j} -lul miwehanta-ko malhayssta. (Korean)
 Mary_i-TOP Jane_j-NOM self_{i/j}-ACC hate-COMP said
 ‘Mary said that Jane hates herself.’ or ‘Mary said that Jane hates her.’
 b. Mary_i said that Jane_j hates herself_{*i/j} (English)

The specific distribution of anaphors in Korean is also determined by orientation constraints, that is, whether its antecedent is required to be a subject or not. The Korean reflexive *caki* appears to be subject-oriented as in (7a)³, whereas reflexives in English have no particular orientation restriction and so can be either subject-oriented or non-subject-oriented as in (7b):

- (7) a. John_i -un Peter_j -eykey **caki**_{i/*j} -ey tayhayse malhayssta. (Korean)
 John_i-TOP Peter_j-DAT self_{i/*j} -about told
 ‘John told Peter about himself.’
 b. John_i told Peter_j about himself_{i/j} (English)

³ The requirement for subject-orientation of *caki* does not appear to be entirely strict (Cho 1994; Gil 1998, 2000); this is accounted for in Section 4.6.1.

The binding properties specific to Korean and English can then be characterised through the interaction of locality and orientation constraints. In particular, the important differences in anaphoric binding between Korean and English are the fact that they have separate binding mechanisms concerning features. Under the Minimalist feature-based approach, reflexive binding is not part of UG (Heinats 2008; Hicks 2009); each language may use different feature compositions associated with particular mechanisms in order to express interpretations of anaphoric binding. For instance, for Hicks (2009), reflexive binding in English is derived from the mechanism of feature valuation under the Agree relation that is independently necessary in the grammar. This kind of analysis is able to explain language-specific constraints of anaphoric binding without the need to invoke principles of UG. It should be noted that properties of reflexive binding in the GB framework do not have to be learnt as this is a principle of UG. In contrast, since feature configurations of reflexive binding between Korean and English are not identical under the Minimalist account, it is not guaranteed that L2 learners can achieve nativelike attainment in this area. Following Lardiere's Feature Assembly Hypothesis in which L2 speakers' divergent outcome is considered as problems in determining the featural composition of target properties, this study predicts that learners may fail to reconfigure the new feature specifications of anaphoric binding. This is in stark contrast to the predictions made for the acquisition of properties of the OPC (see Section 1.2.1).

The overall aim of this experimental study is to investigate whether the acquisition of anaphoric binding involves persistent difficulty for Korean speakers of English in this grammatical structure, and the role that feature-based constraints regarding binding properties play in L2 acquisition. Full details of the empirical study will be presented in Chapter 6.

1.3 Rationale of the study and research questions

The main theoretical supposition of this thesis holds that UG guides and constrains language acquisition in adult L2 speakers. As theoretical conceptions of UG have developed, UG-based approaches to adult L2 acquisition have also progressed in tandem with the understanding of the nature of interlanguage grammars, the influence of the L1, and the role of UG. In other words, within a theoretical shift in generative

syntax, the ‘access to UG’ question in SLA research has inevitably changed to the question of the source of L2 speakers’ grammatical properties in representing the interlanguage grammar. The typical ‘accessibility to UG’ approach has contributed to an account of how L2 speakers come to acquire subtle and complex grammatical restrictions that go far beyond the available input, namely POS problems. This approach has been necessary in developing our understanding of the specific role played by UG in the acquisition of non-native grammars. Although a POS phenomenon offers evidence about the nature of representations in adult L2 grammars which are UG-derived, this does not provide the most convincing reason why adult L2 speakers often show divergent behaviour from native speakers. In consequence, current SLA research intensely debates on the cause of persistent variability observed in L2 speakers. One of the most studied topics among the variety of theories in SLA is the role played by formal features in explaining L2 variability (see White 2009 for an overview). However, it should be pointed out that the traditional ‘UG access’ approach is still fundamental since this account provides essential evidence for the success in overcoming the POS cases. Therefore, the first section of this research focuses on constructions that are claimed to be one of the innate principles of UG, which represents a POS phenomenon. At the same time, the second part of the thesis is concerned with a more updated issue that the nature of L2 interlanguage grammars, which are UG-constrained, often diverges from native-speaker grammars. Unlike first language acquisition, a divergent performance in adult L2 speakers persists in even advanced stages of development. In order to capture the nature of L2 speakers’ learning difficulties, this study particularly takes into account the configuration of formal features which are assembled differently between the L1 and the L2 (see Lardiere 2008, 2009) following a Minimalist view of grammar. The second study of this thesis will provide important perspectives on the role of formal features in the acquisition of a second language.

While a considerable number of studies in L2 acquisition have examined whether the grammar of an adult L2 speaker converges on the grammar of a native speaker of the target language, little research has been conducted on the investigation of learners’ syntactic properties which have a different perspective on UG in the grammar. Therefore, this study aims to offer empirical evidence concerning convergence and divergence on the grammars of L2 speakers, focusing on the status of UG and its

relationship to interlanguage grammars. More significantly, the different conceptions of UG during the theoretical shift from the GB to the MP have made it possible to predict opposing assumptions for the nature of the learning tasks confronting L2 speakers acquiring a new grammar. This section presents two main research questions which are largely general. These will be refined later for working hypotheses in each experimental section.

1. Do adult L2 speakers have full access to UG in acquiring abstract syntactic knowledge of the target grammar (e.g. the Overt Pronoun Constraint)?
2. Do adult L2 speakers successfully acquire relevant feature configurations of the target grammar (e.g. anaphoric binding)?

The first question will examine accessibility to UG by providing evidence from the L2 acquisition of the interpretive constraint on overt pronouns, the OPC. This question will be investigated by assuming Full Access to UG (Schwartz & Sprouse 1994, 1996). If L2 speakers have full access to UG, this study predicts that nativelike convergence of the OPC in L2 is indeed possible. L2 speakers would obtain targetlike behaviour of the OPC without difficulty since the OPC involves innate UG access.

The second question will examine the role of formal features in the L2 acquisition of anaphoric binding. In order to address this question, the Feature Assembly Hypothesis (FAH) (Lardiere 2008, 2009) will be adopted to evaluate data of reflexive binding. The main assumption of this hypothesis is that L2 speakers who already possess a set of formal features of the native language face a complex learning task which involves reconfiguring existing features into a new L2 configuration. Based on these assumptions, this study predicts that L2 learners would experience problems in acquiring both locality and orientation constraints because the learning task involves acquiring new feature reconfiguration in both cases.

1.4 The findings

This thesis presents a comprehensive analysis on the L2 acquisition of pronominal binding with the aim of developing our understanding of whether L2 speakers have access to UG during the SLA process.

First of all, I will provide evidence for the accessibility of UG, and the fact that L2 grammars seem to be constrained by the universal constraint, such as the OPC. The study of the acquisition of the OPC in L2 Korean will demonstrate that UG plays a central part in explaining the nature of adult L2 speakers' linguistic competence. Consequently, English speakers of Korean in this study will acquire the OPC-related properties, irrespective of pronoun position. Crucially, this study will support the view that L2 speakers can have access to the universal restriction of the OPC which is available via UG.

The next issue in this thesis concerns the possibility of the divergent outcome in the L2 acquisition of English reflexives by Korean speakers. A central claim in the study of anaphor binding under the feature-based approach is that L2 speakers fail to acquire new feature specifications that correspond to L2 grammars. As previous research has shown (e.g. Choi & Lardiere 2006; Lardiere 2007a, b, 2008, 2009; Domínguez, Arche & Myles 2011), this study will also demonstrate that problems in the correct feature reconfiguration of the target grammar are persistent, even for L2 speakers at advanced levels of proficiency, as revealed by the picture verification task. Consequently, this result will support a crucial argument of Lardiere's FAH that the process of reassembly of formal features is highly problematic.

In accordance with the results from these two studies, this thesis will conclude that while universal constraints are available in L2 acquisition as native language acquisition, divergence in L2 acquisition can be caused by a failure to reconfigure new feature specifications which are specific to the target grammar.

1.5 Significance of the study

A significant dimension of this investigation is the fact that learners face specific learning tasks in two empirical studies. In one case (e.g. the OPC study), properties of the target grammar which do not exist or are different from the native grammar do not have to be learnt as they are part of UG; in the other case (e.g. the reflexive binding study), new properties of the target grammar will have to be learnt since these are not part of UG. The latter instance makes L2 speakers confront great challenges as their learning process involves remapping or reconfiguring a set of features for the L2 (see Lardiere 2008, 2009). By analysing these two distinct studies, this thesis will attempt to provide a contribution to L2 acquisition research which seeks to advance our understanding on the nature of L2 mental representations and the role that UG plays in the process of L2 acquisition.

Since OPC restrictions are not observed in English, it is unlikely that L1 transfer helps L2 speakers acquire target properties. Furthermore, there is no negative evidence from the L2 target grammar (Korean input) or instructions that can assist L2 speakers to acquire this syntactic constraint of pronominal binding. Therefore, investigating the acquisition of the OPC by English speakers provides an excellent opportunity to examine the availability of UG in L2 acquisition.

The study of L2 acquisition of anaphoric binding focuses on locality and orientation constraints constructed by language-particular feature specifications. A large number of previous studies on L2 reflexive binding have predominantly examined the issue of UG availability within the traditional generative framework of Chomsky (1981, 1986) (e.g. Finer & Broselow 1986; Cook 1990; Hirakawa 1990; Finer 1991; Christie 1992; Bennett 1994; Thomas 1989, 1991, 1995; Eckman 1994; Lakshmanan & Teranishi 1994; White 1995; Wakabayashi 1996; White et al. 1997; Bennett & Progovac 1998; Christie & Landolf 1998; MacLaughlin 1998; Wells 1998; Yip & Tang 1998; Yuan 1998; Ying 1999; Akiyama 2002; Jiang 2009). However, none has investigated L2 reflexive binding within the current Minimalist view of grammar (e.g. Chomsky 2000, 2001).⁴ Therefore,

⁴ It should be noted that an article regarding the L2 acquisition of anaphoric binding presented here has been published in *Language Acquisition* (2012) co-authored with Domínguez and Hicks.

it is timely to examine L2 reflexive binding under the new feature-based approach. This anaphoric binding study will establish accounts of how binding-related features are organised in each language, how they constrain the interpretation of anaphoric binding, and what conditions are required in order for L2 speakers' nativelike outcomes.

1.6 Organisation

This introductory chapter has introduced the aims and brief theoretical background for the two main research questions in the current study. The following six chapters of this thesis are structured as follows:

Chapter 2 provides an introduction to generative perspectives on L2 acquisition and a review of relevant L2 acquisition theories. In this chapter, I provide an overview of the notion of parameters from the GB era to more recent Minimalist conceptions. Then this chapter moves onto the development of generative L2 acquisition research and reviews current L2 acquisition theories.

Chapter 3 gives a descriptive overview of the interpretive differences between overt and null pronouns in quantifier-binding constructions, namely the OPC. In this chapter, I discuss the main syntactic properties of the OPC, as formulated by Montalbetti (1984) and how they apply in Korean. This chapter ends with a review of previous L2 studies on the acquisition of the OPC by native English speakers learning Japanese, Spanish, and Turkish.

Chapter 4 addresses a development of different theoretical analyses of reflexive binding. In particular, this chapter focuses on the theoretical reanalysis of anaphoric binding in English regarding locality and orientation constraints under the Minimalist feature-based account proposed by Hicks (2009). In addition, Korean reflexives are defined as a featural composition, presenting existing analyses within the theoretical framework adopted in this thesis. Lastly, a review of previous L2 studies on the acquisition of reflexive binding is provided.

Chapter 5 and Chapter 6 present two experimental studies on the OPC and anaphoric binding, respectively. Chapter 5 presents two tasks (a co-reference comprehension task and a story-based translation task) on knowledge of the OPC by English speakers of

Korean, and reports a result of the study. Chapter 6 presents a picture verification task on the L2 acquisition of anaphoric binding by Korean speakers of English, and provides a result of the study. These two chapters finish with a discussion of each area of research.

Chapter 7 summarises the findings of the experimental studies, evaluates the predictions, provides possible answers to the research questions as well as pointing out limitations. Then this chapter discusses implications for current L2 acquisition theory and suggests new directions for future L2 acquisition research.

CHAPTER 2

LINGUISTIC THEORY AND SECOND LANGUAGE ACQUISITION

2.1 Development of the theory of ‘Principles and Parameters’ of Universal Grammar

This chapter presents an overview of the Principles and Parameters (P&P) theory of Universal Grammar (UG) from the traditional Government and Binding (GB) approach (Chomsky 1981, 1986) to the current Minimalist account (Chomsky 2000, 2001). I am primarily interested in ‘parameters’ and how the notion of parameters has changed during this theoretical shift and, more importantly, its consequences for L2 acquisition. After presenting some basic concepts and sketching some major claims of language acquisition in generative linguistic theory, this chapter moves on to the review of generative L2 acquisition theories.

2.1.1 The theory of ‘Principles and Parameters’ in the GB framework

It is commonly observed that children acquire their native languages quickly and effortlessly. What is more, they create a mental representation (e.g. syntax, phonology, morphology, and semantics) that goes beyond the input they are exposed to. So the question is: how do they succeed in acquiring their native language with relative ease? They may have received some positive input (e.g. grammatical sentences) in their process of acquiring their native grammar. However, how do they know certain sentences that are ungrammatical without receiving negative input (e.g. feedback such as rephrase ungrammatical sentences given to children in response to their utterances)?⁵ How do children create or produce sentences that they have never heard before? Such claims pose potential learnability problems. That is, for children’s language acquisition, there is an obvious discrepancy between the input that the child is exposed to and the

⁵ Chomsky (1986: 55) notes that “*there is good reason to believe that children learn language from positive evidence only.*”

output in the unconscious grammatical knowledge that the child acquires. This fact is known as the 'poverty-of-the-stimulus' (POS) problem (Chomsky 1980) or 'Plato's problem' (Chomsky 1986). Chomsky (1981, 1986) maintains that the most plausible explanation for this remarkable linguistic capacity is to propose that children are born with an innate language faculty. The biologically endowed innate faculty of language (FL) is Universal Grammar (UG). UG is a theory of the initial state of the innate FL that makes first language acquisition possible by constraining natural human grammars. It is assumed that UG contains a set of principles and parameters. The principles of UG are invariant constraints that are operative in all natural language grammars, whereas parameters allow restricted variation across languages. While the universal principles explain similarities shared by all languages, the language-particular parameters account for language variation. Chomsky notes that the unvarying principles and variable parameters whose values are determined on the basis of the linguistic input (e.g. Primary Linguistic Data) are taken to form a possible grammar.

In the generative model of the GB period (Chomsky 1981, 1986), a range of modular principles of UG were proposed such as the X-bar theory and the Binding theory. They are universal principles which represent abstract properties of language common to all languages and so do not have to be learnt by children. This provides the important benefit that it reduces the load of learning tasks that children face (in the sense that they need not be learnt by children). However, it is clear that there are language-particular parameters which children have to learn as their learning tasks in acquiring a native grammar. Within the module of the GB, parameters are associated with each module of the grammar that exhibit different values or settings across languages. For example, the *wh*-movement parameter is related to the Subjacency principle (Bounding theory) and the head-direction parameter is associated with the X-bar (phrase-structure) principle. The parameters are restricted to a set of structural values available to languages in various domains, thereby ensuring that each language chooses an appropriate value about the same set of on/off (+/-) choices (Berwick 1982; Chomsky 1986). These parameters typically used as a metaphor of a switch box with on/off for particular linguistic properties. The switch is turned to either one or the other position according to the input that is heard in children's linguistic environments. For example, the head-direction parameter involves whether heads, such as Verb, Noun and Preposition,

precede their complements or not; the null-subject (or pro-drop) parameter considers whether tensed clauses can have empty subjects or not; the *wh*-movement parameter concerns whether *wh*-words move or not. Consequently, language acquisition essentially involves the setting of the relevant parameters to the appropriate values in response to the available linguistic input so-called the ‘Primary Linguistic Data’ (PLD). In the sense of Chomsky (1986), the P&P approach interprets the course of language acquisition as “*the process of fixing parameters of the initial state in one of the permissible ways*” (Chomsky 1995: 6).

Since universal principles need not be learnt, the learning task for children is limited to the setting of parameters. Children have to learn or acquire language-specific parameters which are subject to variation across languages. Chomsky (1981: 6) also characterises a parameter as “*in a tightly integrated theory with fairly rich internal structure, change in a single parameter may have complex effects, with proliferating consequences in various parts of the grammar.*” Accordingly, a deductive consequence of a particular parameter has frequently been discussed in language acquisition, which means that a single parameter induces superficially unrelated clustering effects. Indeed, the issue of the co-occurrences of phenomena associated with a given parameter (parametric clustering) leads researchers to expect an account of how it could be possible for children to acquire complex syntactic properties (cf. Biberauer 2008).

The theory of the Principles and Parameters provides an explanation for the possibility of the successful children’s first language acquisition on the basis of the PLD. More specifically, the parametric values (on/off) are assumed to be determined via the PLD, thereby fixing the unvalued parameters of UG. Therefore, each language shows a different choice in each parameter, resulting in cross-linguistic variation. However, it is argued that the simple notion of on/off binary options is not sufficient to explain linguistic variation since empirical evidence clearly shows much more complex situations.⁶ Furthermore, as the linguistic theory develops from the P&P theory to the Minimalist assumptions, the modules of UG do not fit well within the current generative

⁶ Consider the head-direction parameter which determines word-order variation. Although the head-direction parameter has shown a binary behaviour with respect to word-order variation, this is obviously too simple to assume that each language is set only two options. There are different types of word-order variation which does not fit into these binary options. For instance, German shows mixed headness with CP and DP being head-first, whereas VP and TP appear to be head-last (cf. Biberauer 2008).

theory. The P&P approach has often received severe critiques from researchers who also work within the generative theory. For instance, Newmeyer (2004, 2005, 2008) rejects the parameter-based approach concerning linguistic variation and points out that “*the term ‘parameter’ would end up being nothing but jargon for ‘language-particular rule’*” (Newmeyer 2005: 53). Newmeyer argues that linguistic variation is captured by language-particular rules which are independently learnt and are not determined by UG.⁷ This author has drawn a conclusion that the parameter-based approach needs to characterise the properties of rule-based approach that may well be applied to many other languages. Nevertheless, it is not deniable that the binary parametric variation across languages has been a productive testing ground for researchers observing different phenomena in language acquisition, and this topic is still one of heated debate.

2.1.2 The theory of ‘Principles and Parameters’ in the Minimalist Program

Chomsky’s linguistic theories over the past decade or so have been developed from the GB theory (Chomsky 1981, 1986) to the recent version of the theory, the Minimalist account (Chomsky 1995, 2000, 2001). At the same time, the P&P of UG have been modified during this theoretical change.

The Minimalist Program (Chomsky 2000, 2001) explores the optimal design for the Faculty of Language (FL) through bare output conditions (conditions that involve legibility effects of the interfaces) and economy conditions (conditions that involve derivational features of the grammar). On the Minimalist terms, the FL comprises a computational system (Computation for Human Languages) connecting a lexicon and the two interfaces of Logical Form (LF) for interpretation and Phonetic Form (PF) for phonetic Spell-Out. These interface representations interact with the conceptual-intentional (CI) system and the sensori-motor (SM) system, respectively. The lexicon stores lexical items which consist of phonological, morphosyntactic, and semantic features and they are legible to the computational system. The Minimalist analysis concentrates on the properties of morphosyntactic features, also called formal features,

⁷ Newmeyer (2004) has made counterarguments against the P&P theory, dividing into several sections: simplicity, binarity, smallness of number, hierarchical/implicational organisation, clustering, innateness/universality, learnability, and parametric change. However, Roberts & Holmberg (2005) defend the GB parameters, contrary to the idea of Newmeyer’s rule-based approach.

which enter the syntactic computation and has taken a methodological economy to derive grammatical relations. With the advent of the MP, the modules of principles in the GB period have disappeared; recall that each parameter associates with each principle in the module of the GB. Parameters cannot be separated from Principles in Chomsky (1981). The question arising is where the parameters should be placed under the Minimalist approach. As the concept of parameter has changed from the P&P model to the MP, we should seek to characterise what may constitute a possible parameter (cf. Biberauer 2008). It seems unlikely that parameters are conceived the same way in the Minimalist terms. Indeed, researchers have reached a consensus that there are two sources of parametric variation in the MP: i) within the lexicon and ii) at the PF-interface (the mapping to PF) (Biberauer 2008; Gallego 2011).⁸ The latter concerns the way where the syntactic objects are Spelled-Out at the PF interface. The former view is not a new concept in Minimalism. The view that the nature of parametric variation is restricted to the lexicon was first proposed during the GB time as the ‘Lexical Parameterization Hypothesis’ (Borer 1984; Manzini & Wexler 1987). Baker (2008: 353) formulates the Borer-Chomsky Conjecture (BCC) as follows:

The Borer-Chomsky Conjecture (BCC)

All parameters of variation are attributable to differences in the features of particular items (e.g. the functional heads) in the lexicon.

According to Gallego (2011), the BCC signalled observing two directions of consideration where parameters are concerned: micro-parameters and macro-parameters. The BCC favours micro-parameters in which syntactic parameters are reducible to the lexical specification. Therefore, the micro-parametric view falls under the MP parameters since the locus of parameterisation is assumed to locate in the formal features of functional heads. Kayne (2005) takes up this notion and claims that micro-parameters examine a very small range of differences between closely related languages.

⁸ The Strong Minimalist Thesis (SMT) researchers adopt a recent Chomsky’s view (2005, 2007) in that Faculty of Language is optimally designed for the mapping to LF interface but not for the mapping to PF interface, since the mapping to the PF interface is an “*externalization that is a secondary process*” (Chomsky 2005: 4). In consequence, parametric variation is expected with the PF interface level, as part of the imperfect satisfaction of interface conditions in the PF component, of which the syntax is not optimally designed (Richards 2008). I will not look at linguistic variation pertaining to the PF interface since this is not my primary concern.

Kayne (2005) and Rizzi (1997) have examined morphosyntactic variation across Romance dialects. However, this micro-parametric approach creates too many distinctions between languages and consequently it often loses explanatory adequacy. Newmeyer (2005: 68) argues that “*comparing the grammars of individuals could easily lead to the estimate that there are five billion or so distinct grammars differing by one or more parameter setting.*”

As opposed to micro-parameters, Baker (1996, 2001, 2008) has proposed macro-parameters, comparing languages from different language families (e.g. Mohawk and Mayali with Spanish and Swahili, Bantu languages with Indo-European languages). In the words of Baker (2008: 5), “*there are at most a few simple (not composite) parameters that define typologically distinct sorts of languages.*” Baker emphasises that comparing unrelated languages may unpack the effects of a parameter difference that have a large impact on the shape of a language. For instance, he has differentiated distinct language groups dividing into polysynthetic languages (e.g. Mohawk) and non-polysynthetic languages (e.g. English). The classical GB parameters are equated with macro-parameters; the head-direction parameter (Chomsky 1981) and Baker’s (1996) polysynthetic parameter which determines the morphological structures of the language have often been typified as macro-parameters. There seems to be no consensus on what constitutes a ‘true’ parameter; it is not at all clear to me that the two opposite notions of parametric size are essential to characterise the system of parameters. According to Baker (2008: 371), “*the extent-of-variation question is not well defined or theoretically very interesting.*” In this respect, Smith & Law (2009) point out that the parametric/non-parametric distinction but not macro/micro contrast has a role to play in accounting for cross-linguistic variation. Yet it seems that the position of GB parameters within the P&P approach is less clear under the current framework.

Taken together, cross-linguistic parametric variation within the Minimalist analysis relates to properties of the formal features of the functional categories, but not to specification on principles of UG as hypothesised in the GB version of the parameter. This shift from the ‘GB parameters’ (resetting parameters) to the ‘MP parameters’ (lexical specification of parameters) allows us to maintain a much more narrow perspective of parameters since the latter is restricted to a limited number of functional

features. Let us now examine the role of features which are responsible for parametric variation across languages.

2.1.3 The role of formal features

Features carry grammatical information that is encoded in each lexical item and functional head in the lexicon. They can be classified into phi-features (e.g. person, number, and gender), case feature (e.g. nominative and accusative), and categorial features (e.g. N and V). According to Chomsky (1995 et seq.), the distinction between interpretable and uninterpretable features plays a crucial role in the computational system. Interpretable features, such as person and number on nominals, have semantic content and play a role in semantic interpretation at LF, whereas uninterpretable features, such as person and number on verb, do not have meaning and consequently they are not usable (Pesetsky & Torrego 2001). Uninterpretable features derive the derivational process which must be eliminated upon checking for convergence before Spell-Out, where the derivations of LF and PF split. If any uninterpretable features remain in the relevant interface representation, the derivation will crash resulting in ungrammaticality by virtue of the legibility requirement (e.g. the Full Interpretation principle). For a linguistic expression to be grammatical, it must converge at both LF and PF levels.

In the earlier version of the MP (Chomsky 1995), parametric variation was restricted to the feature strength of functional heads like T(ense), Agr(eement), C(omplementizer), and D(eterminer). A formal feature associated with a particular functional category could be strong or weak across languages, thereby resulting in movement prior to or after Spell-Out. If the relevant feature of the head is strong, this strong feature triggers overt movement since the feature must be checked or deleted by a categorial feature. If the feature is weak, a weak feature results in covert movement in LF. A well-known example of this may be overt *wh*-movement in languages like English versus covert *wh*-movement in languages like Chinese (e.g. Huang 1982). English-type languages are conceived to have a strong C feature (or Q feature), so a *wh*-word undergoes movement to check the strong feature in C. Since languages like Chinese and Korean have a weak feature in C, which is invisible at the PF level, there is no movement triggered. A strong

feature is required to be erased before Spell-Out (mapping to PF), deriving overt movement of inflected lexical items. If any strong feature is left unchecked before Spell-Out, the derivation crashes at PF. Contrary to this, a weak feature is invisible at PF and thus does not need to be deleted before Spell-Out. Although the inventory of functional categories is encoded uniformly by UG, languages differ cross-linguistically in terms of this strong/weak feature specification of functional heads.

The parametric differences in the MP in terms of the strength of a functional head have recently been retained on lexical items in functional categories that have uninterpretable features which need to be checked before Spell-Out. In the later Minimalism (Chomsky 1998 et seq.), ‘Agree’ checks or values features of functional heads and lexically marked categories that have been operated by ‘Merge’ or ‘Move’.⁹ That is, an unvalued feature must get a value via the operation ‘Agree’. Once the uninterpretable features have been valued and deleted by the syntactic operations, the derivation is complete. Figure 1 below illustrates the architecture of grammar in the Minimalist framework.

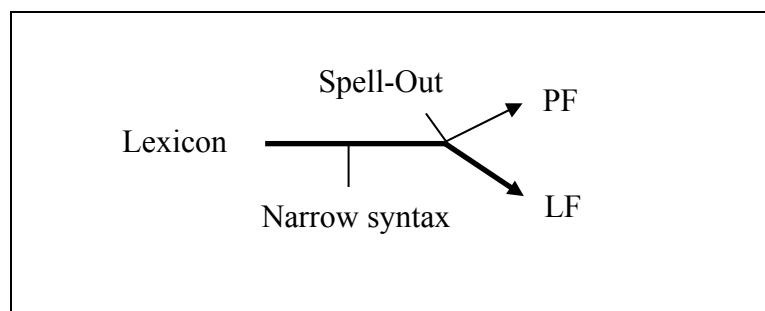


Figure 1: The architecture of grammar in the Minimalist Program
(based on Chomsky 2000)

2.1.4 The process of language acquisition in the Minimalist Program

I have briefly considered the role of formal features in the lexicon, which motivate syntactic operations. One may well ask how grammar is composed by these formal features in the current generative framework. According to Chomsky (1998 et seq.), the Faculty of Language (FL) makes use of a collection of formal features in the lexicon in

⁹ With a recent development of generative framework, Gallego (2011: 541-542) claims that UG should only consist of features and the operation ‘Merge’ (see Chomsky 2007). I will not concern with the latest Chomsky’s works since they are out of the focus in the current study.

the following way (Chomsky 2004: 107) (note that ‘S₀’ means the ‘initial state’ and ‘L’ means ‘language’):

[S₀] determines the set {F} of properties (“features”) available for languages. Each L makes a one-time selection of a subset [F] of {F} and a one-time assembly of elements of [F] as its lexicon LEX [...]. More controversially, for each derivation D, L makes a one-time selection of elements of LEX that will be accessed in D: a lexical array LA (a numeration if elements of LEX are accessed more than once).

As Chomsky describes above, fixing a lexicon of a language can be completed through two processes. One is a selection of the set of features [F] from the universal features {F}, and the other is an assembly from these selected features [F] into the lexical items. The set of lexical items comprises the lexicon of a language. Thus, the selection of [F] from {F} in fixing a language consists of a subset [F] of {F}.

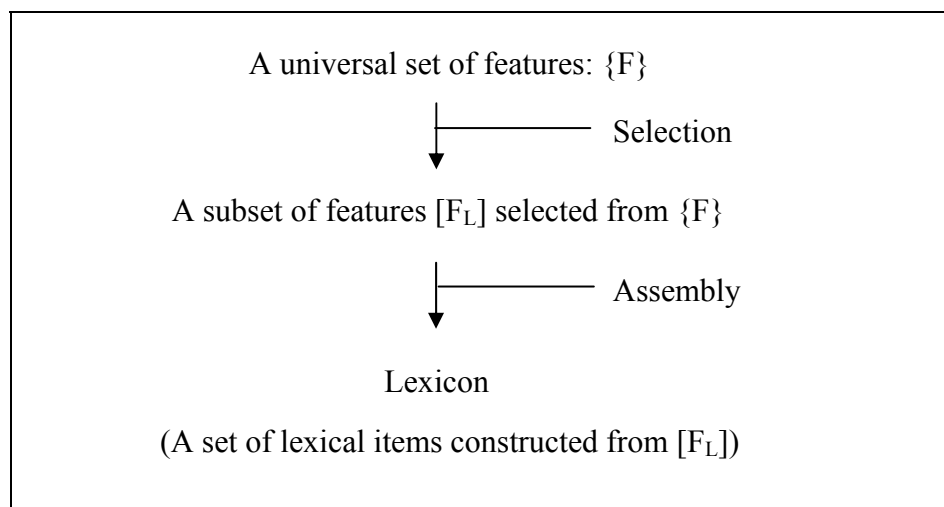


Figure 2: The process of language acquisition in the Minimalist Program
(based on Chomsky 2004)

While the inventory of formal features is universal, different languages select different features from this universal set of features. Languages thus vary as to which features they select. Furthermore, languages differ depending on the way these selected features are assembled, even though they choose identical features in each language. Therefore,

differences in the selection and assembly of formal features between languages can lead to variation in the feature combinations of relevant functional items.

In short, Minimalism takes language to be consisted of a lexicon and a computational system. The computational system contains invariant universal principles and syntactic operations. That is, it is assumed that the computational system is innate, which selects lexical items from the lexicon and constructs derivations. The lexicon is located in functional heads and this is responsible for cross-linguistic variation. Thus, grammar develops in child language acquisition by the interaction of a computational system and a set of universal features {F} in the lexicon on the basis of the PLD.

2.1.5 Section summary

In summarising, I have considered the question of how parameters in the GB framework may be seen in the current Minimalism. Parametric variation within the GB period is considered to be in a set of options (or values) associated with particular grammars of languages. However, it is proposed that parameters are restricted to the lexicon in the Minimalist analysis, as in Borer (1984), called the ‘Borer-Chomsky Conjecture’ by Baker (2008). Claiming the needs of in existence of innate properties of languages, language acquisition can be viewed as a process of selecting formal features made available by UG in response to the PLD, in addition to mapping these features into the lexicon. Under the Minimalism, cross-linguistic variation arises in the morphosyntactic level, thus the task of language acquisition reduces to the setting or learning of formal features associated with the lexical items. Based on the morphosyntactic features, parameterisation is assumed to be restricted to the feature selection from the universal inventory of features, and assembly of these features into the lexicon or combinations of these two processes. In other words, setting a parameter is now considered as an issue of lexical learning of the corresponding functional elements. In the next section, I will look at the development of generative L2 acquisition research; in particular, how different accounts regarding the parameter resetting are put forward in the L2 acquisition theory.

2.2 L2 acquisition in the generative tradition

This section presents poverty-of-the-stimulus (POS) phenomena in L2 acquisition and observes a brief history of generative L2 acquisition studies. Then I intend to introduce and review current L2 acquisition theories. The examination of L2 acquisition theories (in particular the Full Transfer/Full Access hypothesis and the Feature Assembly hypothesis) will become essential in the subsequent chapters of the two experimental studies as they will be parts of working hypotheses in the current study.

2.2.1 Understanding a poverty-of-the-stimulus in L2 acquisition¹⁰

One of the fundamental questions in generative L2 acquisition research is whether L2 speakers successfully acquire a second language and whether this can be achieved by access to UG. Schwartz & Sprouse (2000) have pointed out that L2 acquisition research in the generative framework should emphasise the importance of the POS arguments in order to maintain the claim that UG is accessible for adult L2 acquisition. Furthermore, Schwartz (1998) asserts that if L2 learners show a targetlike performance on the POS phenomenon, UG must be involved in the course of L2 acquisition because there could be nothing to explain such performance in the linguistic environment. It is reasonable to presume that the POS effects arise in L2 acquisition if L2 learners demonstrate subtle and complex grammatical constraints that are not instantiated in their L1 and are not deducible from L2 input or instruction. That is, if L2 speakers have knowledge of the grammatical properties which are not induced from their L1, L2 input or a combination of the two, this would seem clear evidence for the claim that the involvement of innate capacities, UG, is implicated. Thus, L2 knowledge of POS properties can potentially provide a significant role about the accessibility of UG in L2 acquisition.

A large number of studies have examined the POS phenomena in adult L2 acquisition (cf. Schwartz & Sprouse 2000; White 2003). For example, adult L2 speakers

¹⁰ The term of the ‘poverty-of-the-stimulus (POS)’ was first initiated by Chomsky (1980), but a similar concept began to come across before Chomsky (1980). The concept of the POS has been continued to appear as ‘the projection problem’ (Peters 1972), ‘the logical problem of language acquisition’ (Hornstein & Lightfoot 1981), ‘the learnability problem’ (Pinker 1984), ‘Plato’s problem’ (Chomsky 1986), and ‘the underdetermination problem’ (O’Grady 1991) (For a historical overview, see Thomas 2002).

consistently display underdetermined knowledge on constraints of quantifier binding in L2 Japanese (e.g. Kanno 1997, 1998; Marsden 2002a) and L2 Spanish (e.g. Pérez-Leroux & Glass 1999; Lozano 2002; Rothman & Iverson 2007a, b; Rothman 2009) and reflexive binding in L2 English (e.g. Finer & Broselow 1986; Finer 1991; Bennett 1994; Bennett & Progovac 1998; Hamilton 1998; MacLaughlin 1998). In addition, adult L2 learners of French demonstrate a subtle knowledge on interpretation of quantifiers in adverbial position (Dekydtspotter, Sprouse & Thyre 1999/2000), interpretation of restrictions on cardinality interrogative quantifiers (Dekydtspotter, Sprouse & Swanson 2001), and adjectival restrictions of quantifiers (Dekydtspotter & Sprouse 2001) (for an overview, see Slabakova 2006a). These studies have shown strong empirical evidence of access to UG in adult L2 acquisition; and, at the same time, they have offered concrete motivation for invoking UG in L2 acquisition research. More importantly, POS studies build on the Full Transfer/Full Access (FT/FA) hypothesis (Schwartz & Sprouse 1994, 1996) by assuming that all L1 properties transfer and constitute the initial point for L2, then positive evidence guide L2 learners to restructure their L2 interlanguage grammar (we will look at the FT/FA account in further details in Section 2.2.3.2). In contrast to the position of access to UG in L2 acquisition, there are some proponents who debate discontinuity in the accessibility of UG for adult L2 acquisition (e.g. Clahsen & Muysken 1986; Bley-Vroman 1989, 1990; Meisel 1997; Neeleman & Weerman 1997). For instance, according to Bley-Vroman (1989), the logical problem in L2 acquisition is fundamentally different from that of L1 acquisition (i.e. the Fundamental Difference Hypothesis), arguing that UG access is only available in the process of L1 acquisition, and L2 acquisition can be explained by the learner's general problem-solving strategy and L1 transfer. The present study will not consider this position any further.

Since POS studies effectively argue for UG access to L2 speakers, the topic of UG access (or parameter resetting) has been one of the main issues in early generative L2 acquisition research. A considerable amount of work has attempted to identify evidence as to whether UG is available or the parameter (re)setting is possible in L2 learners. However, White (2000) points out that L2 studies in this period have demonstrated too much focus on the source of UG or the source of L1, rather than focusing on the nature of the L2 representations. Accordingly, much of the SLA research has evolved the

investigation of particular grammatical properties in conjunction with the L2 initial state of whether L2 learners transfer all or parts of the L1 grammar (see White 2000). They have attempted to characterise L2 learners' interlanguage grammar and how L1 affects the initial state of L2 and beyond. The development pattern of L2 acquisition appears to go hand in hand with the particular interaction between L1 transfer and UG access. The claims about L1 transfer range from 'No Transfer' to 'Full Transfer'; similarly, the claims about the extent of UG access in L2 range from 'No Access' to 'Full Access'. Some researchers have different positions on UG access, but there seems to be a consensus on the L1 transfer which plays a significant role in a wide range of L2 development (e.g. the initial, subsequent, and final state of L2 grammar). Although earlier generative L2 studies centred upon the role of UG have progressed towards the cognitive interlanguage representations of L2 grammars, the specific details about the nature, extent of L1 transfer, and involvement of UG have still remained and been discussed greatly in the current theory.

In summary, the argument for access to UG is supported by a number of studies in L2 acquisition, thus the POS effects robustly provide evidence in support of UG involvement in adult L2 acquisition.

2.2.2 Development of L2 acquisition within the generative linguistics

The Principles and Parameters (P&P) model has established an account for convergence and divergence among languages as well as providing an explanation of different stages of language acquisition. Following the P&P of the GB framework, language acquisition is considered to involve the setting of binary values of each parameter upon exposure to the available linguistic input that the child encounters. Similarly, the acquisition of an L2 has also been formalised as a process of parameter-(re)setting. There are, however, obvious different acquisition behaviours between adult L2 learners and child L1 grammars. Adult L2 speakers initially start out with a completely developed L1 grammar, they already have a steady state of linguistic system with a fully developed cognitive maturity, and success in L2 acquisition is not uniform or is not guaranteed across learners. At the same time, there are apparent similarities between child L1 and

adult L2 acquisition in that they both come across the logical problem of language acquisition and the learning task that motivate a role of UG.

The early P&P model enabled L2 researchers to describe cross-linguistic variation as different instances of the same principles, but this was not restrictive enough in that it employs further grained criteria for different parameter settings. In this sense, the inventory of functional categories has become important in L2 acquisition research throughout the 1990s. For example, Radford (1990) adopts a maturational explanation for the acquisition of functional categories in L1 children. He proposes that children first acquire lexical categories, and then functional categories emerge later in the course of linguistic development. Furthermore, their acquisition pattern of the functional categories develops gradually from the VP to the IP to the CP.¹¹ Vainikka & Young-Scholten (1994, 1996) propose the Minimal Tree Hypothesis, which is in line with Radford's (1990) structure-building view for L2 acquisition. They point out that L2 learners transfer L1 lexical categories only such as N, V and A. Functional categories are then gradually added from the bottom up on the basis of L2 input and the CP appears at a later stage of the acquisition. In terms of this view, the full inventory of functional categories in adult L2 grammars is absent as in early child L1 grammars. In contrast with the Minimal Tree hypothesis, there are different hypotheses with respect to the availability of functional categories. First, the Full Transfer/Full Access Hypothesis (FT/FA) (Schwartz & Sprouse 1994, 1996) supports that the final state of L1 grammar is the starting point of the L2, and then this is followed by restructuring on the basis of the L2 input in association with UG. Secondly, Eubank's (1994, 1996) Valueless Features Hypothesis proposes that the initial state of L2 is an L1 grammar containing lexical and functional categories, but feature strength is valueless. Lastly, following the same argumentation developed by Tsimpli & Roussou (1991), Hawkins & Chan (1997) and Hawkins (2000) propose an account of a partial availability of UG, which is known as the 'Failed Functional Features Hypothesis' (FFFH). The FFFH assumes that even though UG is fully available in interlanguage grammars, adult L2

¹¹ This structure-building model reflects the 'Weak Continuity Hypothesis' (e.g. Radford 1986, 1990; Platzack 1990) in L1 acquisition. The other opposite approach regarding the L1 initial state is the 'Strong Continuity Hypothesis' (e.g. Hyams 1992; Poeppel & Wexler 1993), according to which children's grammars are almost identical to adults' grammars. Thus, the complete functional categories from the earliest stage of development are available and conform to the principles of UG. For L2 acquisition, the theory of L1 acquisition has provided some idea of particular accounts for the L2 initial state.

speakers are unable to acquire features of functional categories, if they are not activated in speakers' L1 grammar during a critical period. In other words, only features that were set in children's language acquisition will become available for later language acquisition. Much literature within the generative framework debates or supports these different positions regarding the presence/absence of functional categories in special relation with the L2 initial state. The characterisation of cognitive states for target grammars such as the initial state, the subsequent state and the final state has been focused along with parameter resetting issues throughout development, irrespective of their divergence or convergence with native grammars.

More recently, there has been a great deal of research claiming that adult advanced L2 learners on ultimate attainment stages show persistent variability and their grammars diverge from that of native speakers'. Two different positions have proposed to account for the observed non-target divergent L2 grammars: representational deficits (Hawkins & Chan 1997; Hawkins 2000; Franceschina 2001, 2005; Tsimpli 2003; Hawkins & Hattori 2006; Tsimpli & Dimitrakopoulou 2007; Tsimpli & Mastropavlou 2008) and deficits in the surface morphology (Lardiere 1998a, b, 2000; Prévost & White 2000; Goad & White 2004). The former has been extended from the FFFH (Hawkins & Chan 1997), which is the position of no parameter resetting. This approach claims that adult L2 speakers demonstrate constant difficulty with L2 properties that are not instantiated in their L1. In this instance, L1 is claimed to be transferred into L2 grammar, causing L2 learners to show a defective target grammar from native speakers. More specifically, this adopts a view that UG has changed or disappeared during the course of adult L2 acquisition because critical period effects may be found in the interface between UG-derived grammars and relevant components of UG (e.g. uninterpretable features). This paradigm postulates an Interpretability Hypothesis (Tsimpli & Roussou 1991; Tsimpli 1997; Tsimpli & Dimitrakopoulou 2007; Tsimpli & Mastopavlou 2008), according to which uninterpretable features not selected in learners' L1 are not acquirable in L2 acquisition due to the impairment of computational system. For example, Hawkins & Chan (1997) and Hawkins & Hattori (2006) illustrate that Chinese and Japanese speakers learning English show representational deficits with an operator [wh] feature, despite long periods of exposure to the L2, as this feature is absent in L1 Chinese and Japanese (for further discussion, see Section 2.2.3.1).

The other extreme of proposals is the alternative position of parameter resetting along with the FT/FA hypothesis, which is attributable to adult learners' inability to map abstract syntactic features onto the corresponding surface morphology. Non-targetlike acquisition of inflectional morphology does not reflect incomplete acquisition of syntactic structures (e.g. Haznedar & Schwartz 1997; Lardiere 1998a, b, 2000; Prévost & White 2000). Prévost & White (2000) argue that deficient morphology is caused from surface problems between morphological realisation and syntactic representations of tense and verbal agreement, which is termed the 'Missing Surface Inflection Hypothesis' (MSIH). This hypothesis dissociates knowledge of syntactic features from their overt morphological form. Lardiere (1998a, b, 2000) specifies this dissociation between targetlike acquisition of abstract syntactic features of finiteness and agreement and non-targetlike morphology as a "*mapping problem*" (Lardiere 2000: 121). Consequently, L2 variability can be found in the morphological domain, not in narrow syntax. Lardiere (2005, 2008, 2009) and Choi & Lardiere (2006) further elaborate this account as the 'Feature Assembly Hypothesis' (FAH), which is proposed that L2 speakers' divergent performance takes place when they encounter difficulties in identifying formal features which are assembled differently between the L1 and the L2 and remapping primitive feature matrices into the L2 configurations. According to Lardiere (2009), each language makes a selection from the set of features, and the different mixture of features results in language variation. Therefore, parameterisation has become refined as a feature-selection from a finite universal inventory (Lardiere 2009). In essence, Lardiere (2009) has defined L2 acquisition as a process of "*selection and assembly formal features*" (p.175). This may imply that the classical notion of 'parameter-resetting' is not designated terminology anymore, since the process of parameter resetting involves only selection of features. Lardiere's Feature Assembly Hypothesis is a step forward from the parameter resetting approach since all different parameter values are not correlated to one simple notion of the presence or absence of the feature within functional categories. I will come back to these contrasting positions with respect to the L2 theory in greater detail at a later point.

To summarise, earlier studies of L2 acquisition within the GB framework have concerned with the question of whether UG is available or not and mostly focuses on issues of grammatical development associated with parameter resetting. As linguistic

theory develops, the emphasis has gradually shifted from the grammatical characterisation of each language to functional categories, features, and feature values; thus parameter resetting involves acquiring these aspects of the language. However, Lardiere challenges the parameter resetting model and concurrently implements the Feature Assembly Hypothesis, which appears to be an appropriate account for L2 variability.

2.2.3 Recent approaches to L2 acquisition research

As we have briefly discussed, the current trend of L2 acquisition research is to seek whether nativelike attainment is possible in non-native speakers' ultimate attainment. The present section focuses on the core L2 acquisition theories, regarding a state of ultimate attainment, which are currently discussed intensively. This section first reviews two competing hypotheses, the Failed Functional Features Hypothesis (FFFH) and the Full Transfer/Full Access (FT/FA) hypothesis, and then moves towards a very recent direction, namely the Feature Assembly Hypothesis (FAH).

2.2.3.1 The Failed Functional Features Hypothesis

The proponents of the representational impairment in syntax contend that the absence of functional features in L1 causes non-targetlike attainment in L2 acquisition. Unlike the FT/FA approach, UG is only available through learners' L1 in respect to functional features. The Failed Functional Features Hypothesis (FFFH), the Representational Deficit Hypothesis (RDH), and the Interpretability Hypothesis (IH) argue for impairment in the L2 formal features made available by UG, which are limited to the L1 as a result of a critical period.

Adopting the P&P of the GB framework, Hawkins & Chan (1997) have investigated Chinese (Cantonese)-speaking learners of English at three proficiency levels (elementary, intermediate, and advanced) and they have been compared with French-speaking learners of English and native controls in the acquisition of English restrictive relative clauses (RRCs), which involve *wh*-operator movement. The task they employed was a grammaticality judgment task involving 20 grammatical RRCs (e.g. fronted *wh*-

pronouns and a gap within the relative clause) and 30 ungrammatical RRCs (e.g. *wh*-island violations, complex NP violations, resumptive pronouns, and doubly-filled Cs). The Chinese learners showed an apparent targetlike performance in RRCs (such as fronting of *wh*-words and the impossibility of resumptive pronouns) as their proficiency level increases. In contrast, the learners gradually accepted subjacency violations (e.g. *wh*-island and complex NP violations) with their proficiency level. That is, the advanced learners did not exhibit sensitivity to violations of subjacency. As for the results of the advanced learners' low accuracy in rejecting subjacency violations, Hawkins & Chan claim that the learners employ L1-based topic constructions involving a null *pro*, which is a topic base-generated in [Spec CP], but they do not employ operator movement.¹² Contrary to the results of the Chinese speakers, the French-speaking learners of English performed significantly better than the Chinese speakers, since French has a *wh*-feature in C. Based on these findings, Hawkins & Chan conclude that the Chinese-speaking learners of English were incapable of acquiring operator movement because Chinese lacks the *wh*-feature being responsible for operator raising to C. This suggests that their interlanguage grammar is permanently defective, since the formal features that are required by L2 are absent in L1.

A critique of Hawkins & Chan's study has been received from the fact that they did not provide an appropriate explanation for the Chinese-speaking learners' nativelike performance in judging English RRCs (for the relevant critiques, see White 2003; Lardiere 2005). Aware of weakness, in the study of Hawkins & Chan (1997) regarding parametric differences between languages, Hawkins & Hattori (2006) have extended a new version of the FFFH, namely the Representational Deficit Hypothesis (RDH), under the Minimalist account. The fundamental claim of the FFFH is that parameter values associated with functional features that have not been instantiated in learners' L1 grammar will not be acquired in the post-puberty L2 acquisition. The prediction of the FFFH is thus ultimate 'failure' of functional properties throughout the course of L2 acquisition. This can be seen as a 'no parameter resetting' in line with the 'full transfer partial access' instance (White 2000). Earlier similar proposals made by Tsimpli & Roussou (1991) and Smith & Tsimpli (1995) put forward that categorial features of

¹² In the example from Hawkins & Chan (1997) like 'The girl [who I like *e*] is here', a null pronoun (*e*) in Chinese is assumed to be a based-generated null topic, not a trace created by *wh*-operator movement.

functional categories are locus of parameterisation and the parameterisation is subject to maturational constraints. Along the lines of the FFFH, the RDH and the IH are developed within the Minimalist account of feature interpretability; the range of representational impairment in the formal features is reduced to the uninterpretable features. The L2 researchers following this approach (e.g. Hawkins & Hattori 2006; Tsimpli 2003; Tsimpli & Dimitrakopoulou 2007) consider only uninterpretable features such as phi-features on verbs and case features cause learnability problem in adult L2 acquisition. If those L1 uninterpretable features are not selected from the universal inventory of formal features during the critical period, they become no longer accessible in the L2, resulting in a permanent locus of L2 divergence (i.e. fossilisation). In contrast, LF-interpretable features, such as definiteness, phi-features on nouns and *wh*-features in interrogatives, are UG-accessible to L2 learners.

Hawkins & Hattori (2006) examined L2 acquisition of English *wh*-interrogatives by native Japanese speakers. The authors tested whether highly proficient adult Japanese learners can select an uninterpretable *wh*-feature in the post-critical period, following Tsimpli's (2003) Interpretability Hypothesis. Their assumption was that *wh*-movement in English is motivated by an uninterpretable *wh*-feature, but *wh*-in-situ languages like Japanese lack this property. The prediction of the RDH is that uninterpretable features disappear in their L2 grammar if they are not selected from the universal feature inventory by their native language; consequently, L2 speakers' mental representations of the target grammar will permanently differ from those of native speakers. In their study, a truth-value judgment task was used to examine locality constraints on *wh*-movement in bi-clausal multiple *wh*-questions like 'Who did Sophie's brother warn Sophie would phone when?' The results demonstrated that both Japanese L2 speakers and native English speakers performed identically in grammatical constructions. However, their performance was different in ungrammatical constructions; Japanese speakers did not significantly differentiate between grammatical and ungrammatical sentences. They incorrectly accepted ungrammatical constructions in multiple *wh*-questions. Hawkins & Hattori interpret these results as evidence in favour of a critical period, arguing that adult Japanese speakers cannot acquire an uninterpretable *wh*-feature motivating *wh*-movement in English interrogatives due to the failure in the selection of the *wh*-feature. The authors also provided an account for the Japanese

speakers' correct acceptance on the grammatical constructions; L2 speakers use their L1 Japanese *wh*-scrambling in interpreting English interrogatives. Scrambling in Japanese involves an uninterpretable focus feature, which obligatorily moves a *wh*-word. Importantly, their finding suggests that learners' targetlike behaviour may not imply nativelike representations of L2 grammar. Hawkins & Hattori conclude that, in cases where an uninterpretable feature is not selected during the critical period, L2 speakers develop a permanent "*loss of capacity to acquire*" (p. 273) in this domain of syntax and they construct mental representations "*for the L2 structures with alternative resources made available by UG*" (p. 295). However, their argument for the L1-based focus feature with 'alternative resources' does not seem convincing, since they also acknowledge it as "*extremely tentative*" (Hawkins & Hattori 2006: 297).

Tsimpli (2003), Tsimpli & Dimitrakopoulou (2007), and Tsimpli & Mastropavlou (2008) elaborate the Interpretability Hypothesis which maintains that uninterpretable features are subject to maturation constraints of language acquisition; in consequence, L2 speakers resist resetting L1 parametric values associated with these features in L2 acquisition. Tsimpli & Dimitrakopoulou (2007) investigated the use of the resumptive strategy in *wh*-subject and object extraction by intermediate and advanced Greek-speaking learners of English. They tested L2 speakers' degree of acceptability of subject vs. object resumptive pronouns in embedded interrogatives. In L1 Greek, the resumptive pronouns are realised as a cluster of uninterpretable features related to agreement and case, but L2 English does not permit the use of resumptive pronouns in subject or object *wh*-questions. In addition to resumptive pronouns, they also examined possible effects of the interpretable features of animacy and discourse-linking in the resumptive pronouns of L2 English *wh*-interrogatives. The results indicate that the interpretable features of animacy and discourse-linking in L2 English pronouns can be acquired by the native Greek learners, but uninterpretable features associated with L1 resumptive pronouns cannot be attainable. These results lead to conclusion that L2 learners involve "*compensatory use of interpretable features*" (p. 237) in the analysis of L2 properties, but uninterpretable features cause constant learnability problems in L2 grammars.

To sum up, the theory of computational (representational) impairment in L2 grammars is developed from the FFFH to the RDH or IH with theoretical change of the Minimalist Program. The main assumption is that parametric variation is associated with a selection of formal features and this is subject to maturation constraints. The formal features responsible for parametric variation have been narrowed down to a subset of uninterpretable features from the L1 feature inventory of UG. If the uninterpretable features are not selected by their native language throughout the primary language acquisition period, acquisition of those features in L2 is impossible. Therefore, L2 speakers' successful acquisition of target properties can be seen as a presence of relevant uninterpretable features in the L1. The question, however, arises as to whether only selected uninterpretable features by the L1 are attainable in L2 acquisition. There are ample empirical data for L2 speakers' successful acquisition with respect to new L2 uninterpretable features such as verb raising (e.g. Herschensohn 2000; Myles 2005; Conradie 2006; Rule & Marsden 2006; Herschensohn & Arteaga 2009). Another question arises with regard to interpretable features, which carry a semantic interpretation such as agreement features on a pronoun. The proponents of deficit in the computational system in L2 syntax do not discuss the properties of interpretable features in much detail, but they have shown an awareness of interpretable features in the later works as opposed to uninterpretable features.¹³ Under these hypotheses, it seems likely that L2 learners do not pose any difficulty in dealing with interpretable features. However, learnability problem in L2 acquisition can also arise from a failure in reassembling interpretable or uninterpretable features into lexical items (e.g. Lardiere 2008, 2009), which will be the topic of the section 2.2.3.3. The debate can also come from the unclear distinction between interpretable and uninterpretable features within one language. This is because certain features in the same language have different positions on whether those features are interpretable or not. In Hawkins et al. (2008) tense is classified as an interpretable feature, whereas in Leung's (2008) study it is regarded as uninterpretable (cited in Liceras, Zobl & Goodluck 2008). Uninterpretable features in L2 acquisition have known to be problematic for L2 learners; consequently,

¹³ As for interpretable features, Hawkins & Hattori (2006) claim that interpretable features are available throughout life; Tsimpli & Dimitrakopoulou (2007) argue that L2 speakers may use interpretable features for the compensatory purpose in analysing L2 data, even when the interpretable features are not selected in the L1.

Chomsky's interpretability contrast has become a focus in L2 acquisition studies. This unclear distinction of the interpretability may draw on different explanations of language variation within the same language.

2.2.3.2 The Full Transfer/Full Access Hypothesis

Originally formulated under the Principles and Parameters of the GB theory, the Full Transfer/Full Access (FT/FA) hypothesis (Schwartz & Sprouse 1994, 1996) maintains that entire abstract syntactic properties including a range of functional categories and associated features of L1 transfer and constitute the initial point for L2 ('Full Transfer' part of the FT/FA). Accordingly, learners initially produce L2 utterances based on the L1 grammar due to recourse to L1 properties. However, positive evidence in the target input guide L2 learners to restructure their interlanguage grammar and eventually they attain nativelike L2 competence as children acquiring the L1, which supports 'Full Access' to UG of the FT/FA. In other words, when L2 speakers assign sufficient L2 input, they revise the L1-based grammar with recourse to UG in order to accommodate the L2 input. In this case, all abstract syntactic features of functional categories in the target grammar are assumed to be available to L2 speakers; consequently, parameter resetting is possible. Since the FT/FA approach presupposes that there is no specific age effect (i.e. critical period) between child L1 and adult L2 learners, the course of acquisition may be identical between these two different learner groups, thereby arriving at the similar end-state grammar.

Evidence of the FT/FA model comes from Schwartz & Sprouse's (1994) longitudinal case study (26-months period), which examined the development of subject-verb word order and nominative case assignment in an adult Turkish-speaking learners of German, named Cevdet, whose first contact with German was at the age of sixteen. They analysed Cevdet's longitudinal spontaneous oral production data and identified three developmental stages of his L2 German. Both L2 German and L1 Turkish exhibit SOV (subject-object-verb) word-order in embedded clauses, known as head-final VP; but only German exhibits the verb-second (V2) phenomenon in matrix clauses, which requires V-to-C movement (i.e. movement of the finite verb to the second position, the head of CP). Schwartz & Sprouse demonstrate that Cevdet's L2 interlanguage grammar

is consistent with L1 Turkish at the first stage. Cevdet initially transfers their L1 to the initial state of L2 in which only spec-head agreement is used for nominative case assignment like the [-V2] value of L1 Turkish. As his stage develops, he resorts to UG operations for nominative case assignment such as incorporations and government in which L2 German employs. Therefore, the second stage conforms to Full Access to UG in response to L2 German input, thereby acquiring the new [+V2] setting. Yet he has only achieved inversion of the subject and the verb when the subject is pronominal; adverbial and prepositional phrases in clause-initial position are followed by the finite verb. Schwartz & Sprouse point out that the asymmetry between pronominal and non-pronominal subjects can be found in some other natural languages such as French, which is not an option in L2 German or L1 Turkish. At the third stage, Cevdet has begun to produce targetlike German word order, where inversion is not restricted to pronominal subjects. However, non-targetlike word order (e.g. V3) has still persisted throughout all three stages.

Schwartz & Sprouse claim that Cevdet's grammar turns out to be distinct from that of L2 German, thereby showing the [-V2] setting, due to negative input. They argue that Cevdet is exposed in the [+V2] language environment, but he does not receive any utterances indicating that V3 is ungrammatical, which is analogous to the [-V2] value. Consequently, Cevdet has both [+V2] as well as [-V2] constructions in his interlanguage grammar, which is not found neither in Turkish nor in German. Although the L1 effect was observed in later stages of Cevdet's grammar, Schwartz & Sprouse take this as evidence for Full Access to UG that gradual restructure from the L1-based representation to the L2-based representation takes place. Based on the study, the results showed that the participant's L2 interlanguage grammar is neither the L1 nor L2, which demonstrates a poverty-of-the-stimulus effect. This proposal has put emphasis on the 'absolute role of L1 transfer' (the authors' term) and has led to the FT/FA hypothesis (Schwartz & Sprouse 1996). An interesting possibility allowed by the FT/FA theory is that the final outcome of L2 speakers may not be identical to that of a native speaker, despite learners' Full Access to UG. Schwartz & Sprouse (1996) argue that non-targetlike L2 grammar may occur if the target input that need to restructure the L1 grammar is absent, obscure, very complex, or rare (i.e. role of negative evidence, see Schwartz 1993). Based on this view, a lack of positive evidence in the L2 causes non-

convergence on the target language. In other words, L2 restructuring can be interrupted in cases where there is no L2 input that disconfirms inappropriate L1-based representations. In those cases, the relevant properties are considered to be fossilised, but this does not mean that UG is not available. A number of L2 research have followed the FT/FA approach in order to characterise adult L2 speakers' performance regarding convergence on target languages. Particularly, there are studies on the acquisition of semantics with respect to scope phenomena whose semantics is straightforwardly read off the syntax, once a correct syntactic representation is established (e.g. Dekydtspotter, Sprouse & Anderson 1997; Dekydtspotter, Sprouse & Thyre 1999/2000; Dekydtspotter & Sprouse 2001) (see Slabakova 2006a). According to Slabakova (2006a), there is no apparent critical period in acquiring semantic interpretation consistent with the FT/FA model.

To sum up, the FT/FA proposal offers a robust account for UG-based restructuring in L2 development, addressing the cognitive status of interlanguage systems. However, one might ask how much input is required to restructure their L1 grammar, how restructuring takes place, and when Full Access occurs. Note that the illicit [-V2] setting co-occurred with a targetlike [+V2] pattern in Cevdet; it is still unclear how L1-based and L2-based representations emerge simultaneously in his interlanguage grammar. In addition, this model does not provide clear evidence on why L2 speakers do not reach targetlike competence even though their grammar is UG-constrained (but note the authors assert that non-targetlike grammar is attributed to the lack of relevant L2 input). Indeed, the FT/FA approach does not much discuss the stage of ultimate attainment; however, it has been advanced to make testable predictions on the final outcomes of target grammars within the current Minimalist assumptions. In order to account for the observed divergent outcomes, L2 research supporting the FT/FA puts forward one of the most prominent accounts, namely the Feature Assembly Hypothesis (FAH) (Lardiere 2008, 2009), following the same line of the Missing Surface Inflection Hypothesis (MSIH) (Haznedar & Schwartz 1997; Lardiere 1998a, b, 2000; Prévost & White 2000). These proposals are initially derived from the view that mapping problems between surface forms and abstract features are responsible for grammatical errors made by L2 speakers. I will look at the most recent proposal, the FAH, in the next section.

2.2.3.3 The Feature Assembly Hypothesis

The Feature Assembly Hypothesis (FAH) has been developed from the mapping problems between syntax and morphology in L2 acquisition (e.g. Lardiere 1998a, b, 2000). Lardiere speculates that L2 acquisition involves not only a selection of relevant features from a universal feature inventory but also their reassembly of those selected feature bundles from the L1 to the target language settings. According to Lardiere, L2 speakers pose a serious challenge in the learning task when reassembling new feature matrices in the L2 since this process involves a complex mapping relations.

Lardiere (1998a, b, 2000, 2005, 2007a, b, 2008, 2009) examined oral and written production data of an adult Chinese-speaking learner of English, Patty, who was recorded ten years after she had arrived at the US and again eight and half years later. In Lardiere's (2005, 2007a, b, 2008) studies, Patty, who was acquiring English plural marking, rarely produced a plural suffix (*-men*) in obligatory contexts during the first recording, which suggests that her interlanguage grammar had fossilised. However, after 8.5-year gap between the first and the second recordings, her plural marking rates subsequently increased, even though the accuracy rates were not very high (58.33%). These results provide that Patty demonstrates target deviant behaviour in regard to plural marking even after extensive exposure to the target language environment. Following Aoun & Li's (2003) analysis with respect to plural marking in Chinese, Lardiere claims that both Chinese and English share a [+plural] feature; however, the [+plural] feature of Chinese is differently configured in comparison to that of English. For example, Chinese nouns cannot be pluralised when the quantifier or classifier is accompanied. The plural marker *-men* is limited to [+human] nouns, which is obligatory with personal pronouns like *wo-men* 'we/us', but is optional with other kinds of human nouns like *xuesheng* 'student(s)'. In addition, these plural nouns require a definite reading. Conversely, in English, nouns with overt plural marking can be either definite or indefinite and the plural marker *-s* is used obligatorily. According to Lardiere (2005, 2007a, b, 2008), the learning task confronting a Chinese speaker of English plural marking involves discovering how formal features of plurality and definiteness are assembled in the L1, and reassembling them as manifested by the L2. Patty's non-targetlike behaviour does not stem from the unavailability of the plural features in the

L1 since both L1 and L2 share plural features. Instead, her performance has been attributed to differently assembled features of plural marking in the L1 and the L2.

Choi & Lardiere (2006) and Choi (2009) examined two different interpretations of *wh*-expressions in L2 Korean by native speakers of English. The authors assume that both Korean and English select a *wh*-operator [OP] ([Q] and [wh] features) and a variable [VAR] feature for *wh*-words, but the way in which the features are assembled into lexical items differs between languages. Accordingly, the authors claim that the parameter-resetting approach is not an appropriate account for the acquisition of *wh*-in-situ languages such as Korean by speakers of overt movement languages like English, because a parameterised strong *wh*-feature is not involved. According to Choi & Lardiere (2006) and Choi (2009), Korean *wh*-words are variables which lack an inherent *wh*-operator, and they have two distinct interpretations: one is a question reading and the other is an existential/universal reading. For example, a Korean *wh*-word *mwues* can be interpreted as an interrogative in (1a) or as an indefinite in (1b):

- (1) a. con-un meyli-ka *mwues*-ul sa-ss-*nunci* alko-iss-ta.
 John-TOP Mary-NOM THING-ACC buy-PAST-Q know-be-DECL
 ‘John knows *what* Mary bought.’
- b. con-un meyli-ka *mwues*-ul sa-ss-*ta*-ko alko-iss-ta.
 John-TOP Mary-NOM THING-ACC buy-PAST-DECL-C know-be-DECL
 ‘John knows (that) Mary bought *something*.’
- (Choi 2009: 354)

Each reading is morphologically licensed by sentential particles [\pm Q] features. The [+Q] feature is morphologically licensed as a sentential question particle *-ci* that affixes to the verb, as shown in (1a). The [–Q] feature, on the other hand, is licensed as a declarative particle *-ta*, and this induces an indefinite reading such as ‘something’ in a declarative clause, as in (1b). Given this different set of feature composition in each language, only question reading is allowed in English, whereas question and existential/universal readings are possible in Korean.

The intermediate and the advanced adult L2 speakers participated in the translation and the truth-value judgment tasks in order to find out whether they are able to differentiate two different readings between a question and an indefinite reading. Their results showed that the L2 speakers failed to distinguish between these two readings since they misanalysed an indefinite reading as a question reading. The L2 speakers' correct performance in interpreting *wh*-expressions improves as their proficiency level rises, but non-targetlike outcomes persist with some of the advanced learners. Choi & Lardiere (2006) and Choi (2009) conclude that English native speakers' difficulties in acquiring Korean *wh*-elements reside in reassembling relevant features into an L2 in which *wh*-words are variables and its licensors are morphologically expressed by sentential particles in lexical items.

In summing up, the underlying assumption of the Feature Assembly approach is that the parameter resetting model may not provide a full explanation for L2 speakers' observed morphological variability, because learning issues posed by L2 speakers may not be fully explained by the simple notion of a \pm metaphor. Therefore, learners' learning process involves remapping relevant features into L2 lexical items. This model offers not only a critical view on the parameter resetting model but also a new perspective on the language-specifically clustered formal features in L2 acquisition. Although this approach highlights a concrete account for L2 speakers' incomplete attainment, some researchers have shown doubts about this new approach. For instance, Montrul & Yoon (2009) argue that they agree with Lardiere's proposal of how features are assembled into lexical items when (re)structuring learners' grammars; but they disagree with a removal of the traditional notion of 'parameters' in L2 acquisition. Instead of the dismissal of parameters, Montrul & Yoon emphasise the integration between specific features and parameters between languages. Further Montrul & Yoon have raised some questions that need to be addressed such as what kinds of features can be selected, what are the constraints on feature assembly, whether the selection of a feature entail that of another feature, and whether setting the value of a certain parameter of lexical item leads to the setting a value of another parameter. Despite these remaining issues, it seems undeniable that this new perspective enables us to understand more complex acquisition tasks with a finer-grained analysis.

2.2.4 Section summary

The fundamental question in generative L2 acquisition studies is to examine whether L2 learners can achieve nativelike syntactic representations. SLA studies under the Principles and Parameters of UG framework have broadly provided two different paradigms in relation to an age effect (i.e. critical period): SLA studies generally point to no age effects on the acquisition of principles of UG, whereas they are still under debate whether UG-based parameters are influenced by a critical period. A great deal of SLA literature has demonstrated that adult L2 learners still have access to UG principles (e.g. the Overt Pronoun Constraint) (e.g. Kanno 1997, 1998; Pérez-Leroux & Glass 1999; Marsden 2002a; Lozano 2002; Rothman & Iverson 2007a, b; Rothman 2009). However, as for the UG-based parameters, there are two opposing positions in the current SLA literature. One position is represented by the FFFH (e.g. Hawkins & Chan 1997; Hawkins & Hattori 2006), which implies that maturation effects affect nativelike ultimate attainment. The other position is represented by the FT/FA (Schwartz & Sprouse 1994, 1996), arguing that nativelike ultimate attainment is indeed possible. Building on the FT/FA hypothesis, Lardiere (2008, 2009) has developed the FAH which moves away from parameters to features.

2.3 Summary of Chapter 2

This chapter has first presented an overview of the generative linguistic theory that provides the theoretical background of the current study. In particular, I have looked at the gradual shift from ‘parameters’ to ‘features’ that has affected the view of parameters. Cross-linguistic variation has now been accounted for by taking into consideration the properties of individual features in the Minimalist framework. Along with the generative syntactic change, the focus of generative L2 acquisition studies has also moved away from ‘parameter resetting’ towards ‘selecting and assembly of features’. Learning a target grammar is thus viewed as acquisition of lexical items of the functional categories with their associated parameter settings.

Second, this chapter has sketched the necessity of research regarding innate linguistic knowledge in L2 acquisition which displays POS phenomena where L2 learners’

outcomes cannot logically be induced from L1 or L2 target input. A great deal of research has examined targetlike UG-based constraints on L2 grammatical knowledge. These studies have provided convincing evidence against the critical period that imposes discontinuity in the availability of UG for adult L2 acquisition. One instance of the POS properties in L2 acquisition is the Overt Pronoun Constraint (OPC), which is innate linguistic knowledge. The first part of the current study will thus investigate whether English-speaking learners' interlanguage grammar is constrained by the OPC.

Third, this chapter has particularly concentrated on the critical review of parameters of UG in L2 acquisition, namely the Failed Functional Features Hypothesis (FFFH), the Full Transfer/Full Access Hypothesis (FT/FA), and the Feature Assembly Hypothesis (FAH). The FFFH (Hawkins & Chan 1997), which is refined as the Representational Deficit Hypothesis (Hawkins & Hattori 2006; Tsimpli 2003), argues for permanently impaired representations of abstract features due to a maturational constraint. It maintains that an apparent targetlike performance in L2 learners is ascribed to the properties of compensatory L1-based syntactic representations. In contrast, the FT/FA account (Schwartz & Sprouse 1994, 1996) assumes that learners' default hypotheses for the L2 initial state draw from the L1 parameter values, but the parameter resetting to the L2 (i.e. L2 restructuring) can be attained through Full Access to UG. L2 restructure, however, does not necessarily lead to convergence upon the target grammar due to the lack of negative L2 input. The parameter-based accounts such as the FFFH and the FT/FA have resulted in opposing outcomes (i.e. convergent versus divergent) of adult L2 acquisition which have largely been inconclusive to date. In addition, they appear to be theoretically unsatisfactory, since neither can identify sources of non-targetlike performance at ultimate attainment. In order to uncover the observed possible reasons for the divergent outcomes of the FT/FA, the alternative account, the FAH (Lardiere 2008, 2009), is eventually proposed. The FAH argues that learners' non-targetlike grammars are attributed to not only the selection of features but also the reassembly of the corresponding features into new configurations. In the second part of the present study, I will test the validity of the very recent feature-based account for the investigation of L2 anaphor binding by Korean-speaking learners of English.

CHAPTER 3

THE OVERT PRONOUN CONSTRAINT IN L2 ACQUISITION

This chapter explores the distribution of overt/null pronominals by focusing on one of the principles of UG, the Overt Pronoun Constraint (OPC), in L2 Korean. The OPC is only satisfied by pro-drop languages like Korean, and not by non-pro-drop languages like English. I first provide an analysis of interpretive restrictions regarding overt and null pronouns in Korean and present a subtle restriction on their distribution, the OPC proposed by Montalbetti (1984). Next, a detailed syntactic analysis of the OPC in Korean is presented. The final section reviews some relevant previous L2 research and examines whether such knowledge is achieved by native speakers of English learning Spanish, Japanese, and Turkish.

3.1 The distribution of overt and null pronouns

As I briefly mentioned in Chapter 1, English always requires an overt pronoun in subject position whereas subject pronouns in East Asian languages such as Korean, Chinese and Japanese or in Romance languages like Spanish and Italian may either be overt (phonetically realised) or null (phonetically absent). The null pronouns of tensed clauses are known as '*pro*', so languages such as Korean and Spanish are referred to as pro-drop or null-subject languages and languages like English as non-pro-drop or non-null-subject languages. The presence of null elements *pro* has been motivated by the Extended Projection Principle (EPP) (Chomsky 1981, 1982) in which states that the subject position of the sentence must be filled. That is, every sentence has a subject whether it is overt or null. English always needs to be overtly realised either by filling a subject or an expletive. In Korean-type languages and Spanish-type languages, the EPP need not always be overtly occupied but could be covertly occupied by filling a phonologically null element, *pro*.¹⁴ While the EPP has been assumed to be one of the

¹⁴ Within the Minimalist Program (Chomsky 1995), the concept of the EPP has been changed based on the feature-checking mechanism; for example, T triggers a strong D-feature which attracts a nominal

principles of UG, and as such, supposedly holds universally, the availability of *pro* is subject to parametric variation. Accordingly, a language-specific parametric setting has arisen from the difference [\pm pro-drop] (or [\pm null-subject]) between the L1 and the L2, which is known as a pro-drop parameter (or null-subject parameter) (Chomsky 1981; Jaeggli 1982; Rizzi 1982).¹⁵ Korean, a pro-drop language, allows extensive use of null arguments in both subject and object positions; these invisible arguments are believed to be an alternative for overt pronouns. Let us examine the following structures which illustrate the interpretations of pronominals in subject position in English.

- (1) a. John_i believes that he_{i/j} is intelligent. (English)
 b. *John believes that (*pro*) is intelligent.

In (1a), the overt pronoun ‘he’ in the embedded clause can be co-referential with ‘John’ who is the subject of the main clause, or it can refer to someone not mentioned in the sentence, as shown by the index ‘j’. However, the sentence in (1b) is not grammatical as English does not allow null pronouns. Now consider the equivalent constructions in Korean.

- (2) a. John_i -un [**ku**_{i/j} -ka ttokttokhata]-ko mitnunta. (Korean)
 John_i-TOP he_{i/j}-NOM intelligent-COMP believe
 ‘John believes that he is intelligent.’
 b. John_i -un [**pro**_{i/j} ttokttokhata]-ko mitnunta.
 John_i-TOP (he_{i/j}) intelligent-COMP believe
 ‘John believes that (he) is intelligent.’

category to [Spec TP]. In more recent views (Chomsky 2000), it is suggested that the EPP is associated with an EPP feature on D which triggers the subject DP movement to the specifier position through a long-distance Agree, rather than [\pm strong] features. This view is somewhat conformed to the earliest view, which is that certain functional heads must have a specifier (see Lasnik 2001).

¹⁵ The null-subject parameter is one of the most discussed parameters in L2 acquisition research (e.g. White 1986; Phinney 1987; Liceras 1989; Al-kasey & Pérez-Leroux 1998). In accordance with the theoretical development of the EPP, the pro-drop parameter (or null-subject parameter) can be explained in terms of the requirement of the specifier on certain functional heads (Chomsky 1981), the feature strength (Chomsky 1995), or presence/absence of EPP features (Chomsky 2000). I will not deal with the details of the pro-drop parameter as this is not a topic of the study.

In (2a), the overt subject pronoun *ku* can refer either to ‘John’ or someone else in the discourse. Like the overt pronoun *ku*, the null pronoun *pro* can be co-referential with the matrix subject or can also have a sentence-external referent, as in (2b). Therefore, *pro* can be seen as a counterpart of the overt pronoun *ku* since *pro* appears in the same position as the overt pronoun. That is, the overt and null pronouns occur in identical contexts, thereby showing free variation of overt and null pronouns in this particular context. This phenomenon can be observed in other null subject languages such as Spanish and Japanese as follows (examples from Montalbetti 1984; Kanno 1997).

- (3) a. Juan_i cree que [**pro**_{i/j}/él_{i/j} es inteligente] (Spanish)
 John_i believes that *pro*_{i/j}/he_{i/j} is intelligent
 ‘John believes that (he)/he is intelligent.’
- b. John_i -wa [**pro**_{i/j}/**kare**_{i/j} -ga atama-ga ii to] omotte-iru. (Japanese)
 John_i-TOP *pro*_{i/j}/he_{i/j}-NOM intelligent-COMP believe
 ‘John believes that (he)/he is intelligent.’

Although English does not allow null arguments, the distribution of the subject pronoun in English (1a) is very similar to that of the Korean overt subject pronoun in (2a). The null-subject languages permit overt/null pronouns to have referring DPs as its antecedents as in (2) and (3). However, this does not entail that their distributions are always in free variation. Consider the following examples in Korean based on Hong (1985, 1986).

- (4) a. *Motun haksayng_i -un [**ku**_i -ka ttokttokhata]-ko sayngkakhanta.
 every student_i-TOP he_i-NOM smart-COMP think
 ‘Every student thinks that he is smart.’
- b. *Nwu(kwu)_i -ka [**ku**_i -ka ttokttokhata]-ko sayngkakha-ni?
 Who_i-NOM he_i-NOM smart-COMP think-Q
 ‘Who thinks that he is smart?’

As shown in (4a) and (4b), there is a restriction on what the overt pronoun may refer to in pro-drop languages like Korean. In particular, when the matrix subject contains a

quantified expression such as ‘everyone’, ‘someone’ and ‘no one’ or a *wh*-phrase such as ‘who’ and ‘which’, the overt pronoun cannot take these quantified expressions or *wh*-words as its antecedent. Therefore, the overt subject pronouns *ku* ‘he’ in (4a) and (4b) cannot be interpreted as co-referential with *motun haksayng* ‘every student’ and *nwukwu* ‘who’, respectively. In contrast, in English, a subject pronoun in an embedded clause can have a quantified phrase or a *wh*-phrase in the main clause as its antecedent, as shown in (5a) and (5b).

- (5) a. Every student_i thinks that he_{i/j} is smart.
 b. Who_i thinks that he_{i/j} is smart?

Before examining the restriction on the overt pronoun in Korean in greater detail, it is necessary to consider the interpretive differences regarding the use of overt pronouns and how they are defined as a relevant semantic representation.¹⁶ Let us consider the sentence (5a). The pronoun ‘he’ in the embedded clause can be interpreted in at least two different ways. First, ‘he’ can be interpreted as some other individual (referring to ‘Peter’ for example in the discourse) who is a male referent outside the sentence. In this case, the pronoun ‘he’ takes so-called a *disjoint* (or *free*) interpretation. Second, ‘he’ can be interpreted as a variable bound by the quantifier DP ‘every student’. In this case, the pronoun ‘he’ can receive a *bound variable* interpretation via the formal variable resulting from a Quantifier Raising (QR)-trace.¹⁷ These different interpretations can be given the following semantic representations:

¹⁶ Evans (1980) has classified the use of the pronouns into the following categories: a. Free pronouns b. Coreferential pronouns c. Bound pronouns d. E-type pronouns. First, free pronouns indicate someone outside the sentence but may refer to a particular referent within the discourse. Second, coreferential pronouns are a referring expression occurring elsewhere in the sentence. Third, bound pronouns are related quantified noun phrases in certain structures. When a pronoun functions as a bound variable, the intended interpretation is determined by the quantifier it is related to. Finally, E-type pronouns have quantifier expressions as antecedents but are not bound by those quantifiers. The last type of pronouns does not concern us here.

¹⁷ Binding and coreference are not assigned by the same constraints (Reinhart 1983; Grodzinsky & Reinhart 1993). Reinhart (1983) has pointed out that a bound variable interpretation of pronominals is not restricted to a quantified DP, but they can also have a bound variable interpretation with a definite DP. The difference is that sentences with quantified antecedents allow only a bound variable interpretation, while sentences with referential DPs can allow both a bound variable interpretation and a coreference interpretation. In the following example (1) from Grodzinsky & Reinhart (1993: 74), the coindexation is taken to be ambiguous between the bound variable reading (1a) and the coreference reading (1b).

(1) Alfred_i thinks he_i is a great cook.

- (6) a. disjoint reading: $\forall x[(\text{student}(x) \rightarrow \text{think}(x, \text{smart}(\text{Peter})))]$
 (Every x : x is a student) x thinks that Peter is smart
- b. bound variable reading: $\forall x[(\text{student}(x) \rightarrow \text{think}(x, \text{smart}(x)))]$
 (Every x : x is a student) x thinks that x is smart

In order to illustrate the bound variable and disjoint interpretations, let us suppose that there is a group of male students, such as ‘John’, ‘Paul’ and ‘Tom’, in the classroom. In the LF representation (6b), each student of the group in the classroom thinks of himself as smart. For example, John thinks himself smart, Paul thinks himself smart, and Tom thinks himself smart. This gives us a bound variable reading. However, in the LF reading (6a), the pronoun refers to a particular individual in the discourse, as shown in (7) below, which has to be interpreted as ‘*Every student thinks he (= Peter) is smart*’.

- (7) Peter_j scored the highest mark in the exam. [Every student_i thinks [that he_j is smart]]

To summarise so far, English sentence (1a) is ambiguous with ‘he’ referring to ‘John’ or to some other discourse referent. Similarly, English sentences (5) are ambiguous since the subject pronoun in the embedded clauses can be interpreted as a variable bound to the quantifier/*wh*-word or as a disjoint reading referring to a particular individual outside the sentence. However, in Korean, the overt pronoun cannot take the quantified antecedent (Hong 1985, 1986; Choe 1988). This phenomenon regarding the restriction on the bound variable interpretation in quantified expressions is proposed by Montalbetti (1984) as the Overt Pronoun Constraint (OPC). The next section provides a more detailed description of the OPC.

3.2 The Overt Pronoun Constraint

Montalbetti (1984) proposed the Overt Pronoun Constraint (OPC) in part to explain the interpretive contrast between overt and null pronouns, in pro-drop languages that

-
- a. Alfred ($\lambda x(x \text{ thinks } x \text{ is a great cook})$)
 b. Alfred_i ($\lambda x(x \text{ thinks he}_i \text{ is a great cook})$)

involved binding phenomena and this has been postulated as a property of UG. Based on Montalbetti (1984), the OPC can be defined that an overt pronoun cannot have a bound variable interpretation (i.e. cannot take quantified or *wh*-words as an antecedent) when a corresponding a null pronoun is available. In other words, an overt pronoun can be interpreted as a bound variable if the context where null pronouns are not permitted. This restriction is originally given in (8):

- (8) Overt Pronoun Constraint: Overt pronouns cannot link to formal variables iff the alternation overt/empty obtains (Montalbetti 1984: 94).^{18, 19}

As pointed out by the definition of the OPC, two conditions are required for the OPC effects. On the one hand, languages should be pro-drop languages; on the other hand, within pro-drop languages, relevant contexts should hold an alternation between overt and null pronouns. Let us now look at some Spanish examples (Montalbetti 1984: 90-100).

- (9) a. Nadie_i cree [que él_{*i/j} es inteligente]
 ‘Nobody believes that he is intelligent.’
 b. Nadie_i cree [que **pro**_{i/j} es inteligente]
 ‘Nobody believes that (he) is intelligent.’

The overt pronoun *él* ‘he’ in (9a) cannot take a bound variable reading, but the null pronoun *pro* in the embedded clause is ambiguous between a bound variable reading and a disjoint reading, as shown in (9b). A *wh*-trace is also a formal variable and thus an overt pronoun cannot be interpreted as a bound pronoun, as shown in (10a). The empty

¹⁸ Montalbetti (1984) adopts Higginbotham’s (1983) linking theory alternative to coindexing of binding theory and extends linking to deal with a distinction between binding and coreferential relations, which argues that coreference and binding are not governed by the same mechanism.

¹⁹ The definition of a formal variable is as follows:

Formal variable: *v* is a formal variable iff (i) *v* is an empty category in an argument position; and (ii) *v* is linked to a lexical operator in a non-argument position (Higginbotham 1983, cited in Montalbetti 1984: 48).

Montalbetti (1984: 49) establishes the relation between formal variables and pronouns as follows:

A pronoun *P* is a bound pronoun iff (i) *P* is in the scope of (=c-commanded by) a formal variable *v*; and (ii) *P* is linked to *v*.

pronoun *pro* in (10b), in contrast, can serve as a bound variable reading.

- (10) a. Quién_i cree [que él_{*i/j} es inteligente]
 ‘Who believes that he is intelligent’
 b. Quién_i cree [que **pro**_{i/j} es inteligente]
 ‘Who believes that (he) is intelligent’

Consider the more complex structure (11) below:

- (11) [Quién_i cree [que **pro**_i di jo [que él_i es inteligente]]]
 ‘Who believes that (he) said that he is intelligent’

In (11), the null pronoun *pro* which is the subject of the intermediate clause can be bound by *quién* ‘who’. In the case of the overt pronoun *él* ‘he’, it is linked to the null pronoun *pro* by binding, so that the overt pronoun is interpreted as a bound variable reading. That is, the intermediate bound pronoun *pro* is involved in the binding of the overt pronoun. This suggests that the bound variable reading of the overt pronoun is possible when it is linked to a bound *pro* (not to a formal variable). The important point is that the syntactic distribution in which the contrastive interpretations between overt and null pronouns described above cannot be predicted by the OPC when the antecedent of an overt pronoun is a referential DP; then the restriction disappears (Montalbetti 1984: 85). This was shown in (3a), repeated below:

- (12) a. Juan_i cree [que él_{i/j} es inteligente]
 ‘John believes that he is intelligent.’
 b. Juan_i cree [que **pro**_{i/j} es inteligente]
 ‘John believes that (he) is intelligent.’

Crucially, Montalbetti (1984: 87) has observed cases of bound variable readings when overt pronouns occur in a position where null pronouns cannot appear such as inside PPs, as illustrated in (13). In this case, the OPC cannot apply since there is no alternation between overt and null pronouns.

- (13) Algunos pescadores_i temen que el barco parta sin **ellos_i**/ ***pro**
 ‘Some fishermen are afraid that the boat will sail without them.’

To summarise thus far, this section has observed the original formation of the OPC proposed by Montalbetti (1984), which is exemplified in Spanish. The OPC regulates the distribution of overt and null pronouns in null-subject languages with respect to a bound variable interpretation between overt or null pronouns in quantified DPs or *wh*-phrases of the matrix clause. In the following section, I will turn my attention to Korean. Since Korean allows a null pronoun not only in subject position but also in object position, the OPC will be examined in both positions and see whether the OPC in Korean has a similar distribution across other pro-drop languages such as Spanish.²⁰

3.3 The Overt Pronoun Constraint in Korean

3.3.1 The Overt Pronoun Constraint in subject position

I have briefly identified the OPC in Korean in part to account for the interpretive differences noted in Section 3.1. In this section, I will provide further evidence to examine whether the OPC operates in subject and object positions and discuss whether the OPC has similar patterns across pro-drop languages. Let us consider the following examples with overt subject pronouns:

- (14) a. Amwuto_i [kunya_{*i/j} -ka pwuyuhay-ss-ta]-ko malhaci anh-ass-ta.
 nobody_i-NOM she_{*i/j}-NOM rich-PAST-DECL-COMP say NEG-PAST-DECL
 ‘Nobody said that she was rich.’
 b. Nwu(kwu)_i -ka [kunya_{*i/j} -ka pwuyuhay-ss-ta]-ko malhayss-ni?
 Who_i-NOM she_{*i/j}-NOM rich-PAST-DECL-COMP said-Q
 ‘Who said that she was rich?’

In (14a), the embedded overt pronoun *kunya* ‘she’ cannot take the quantified matrix

²⁰ Montalbetti (1984) and Noguchi (1997) argue that OPC effects may occur in object position when overt object pronouns can alternate with null objects in pro-drop languages.

subject (QDP) *amwuto* ‘nobody’ as its antecedent. That is, as predicted by the OPC, an overt pronoun *kunye* cannot be bound by a quantifier, *amwuto* ‘nobody’. Therefore, the subject of the embedded clause cannot have the quantifier *amwuto* as its antecedent, but rather it refers back to some other person from the discourse. The overt pronoun *kunye* in (14a) thus has only a disjoint reading, but not a bound variable reading. Consider the example (14b), where the overt subject pronoun *kunye* ‘she’ in the embedded clause cannot take a *wh*-word, *nwukwu* ‘who’, as an antecedent. Since a *wh*-trace is a formal variable, the overt subject pronoun cannot be bound to the *wh*-word. More cross-linguistic examples in terms of the distinction between a bound interpretation and a disjoint interpretation can be observed in pro-drop languages as below²¹:

- (15) a. Dare_i -ga [**kare**_{*i/j} -ga atama-gaii to] omotte iru no. (Japanese)
 who_i-NOM he_{*i/j}-NOM smart-COMP think
 ‘Who thinks that he is smart?’
- b. Daremo_i -ga [**kare**_{*i/j} -ga atama-gaii to] omotte iru.
 everyone_i-NOM he_{*i/j}-NOM smart-COMP think
 ‘Everyone thinks that he is smart.’
- c. Shuei_i renwei [**ta**_{*i/j} congming] (Chinese)
 who_i thinks he_{*i/j} smart
 ‘Who thinks he is smart?’

Although the OPC does not allow a bound variable reading for the overt pronoun *ku* ‘he’ or *kunye* ‘she’, these examples become grammatical when the overt pronoun is replaced by an empty category, *pro*, as in (16).

- (16) a. Amwuto_i [**pro**_{i/j} pwuyuhay-ss-ta]-ko malhaci anh-ass-ta.
 nobody_i-NOM (she_{i/j}) rich-PAST-DECL-COMP say NEG-PAST-DECL
 ‘Nobody said that (she) was rich.’

²¹ These examples of Japanese, Chinese, and Spanish come from Kanno (1997) and Montalbetti (1984). Hoji (1985), Saito & Hoji (1983), and among others have also observed Japanese personal pronoun such as *kare* ‘he’ cannot function as a bound variable.

- b. Nwu(kwu)_i -ka [**pro**_{i/j} pwuyuhay-ss-ta]-ko malhayss-ni?
 Who_i-NOM (she_{i/j}) rich-PAST-DECL-COMP said-Q
 ‘Who said that (she) was rich?’

Furthermore, if the matrix subject is not a QDP/*wh*-word but a referential DP (RDP) and the embedded subject is overt (or null), there is no restriction on the co-referential interpretation. This was illustrated in (2a) and (2b), repeated with different examples below:

- (17) a. Peter_i -nun [**ku**_{i/j} -ka pan-eyse ceyil ttokttokhata]-ko mitnunta.
 Peter_i-TOP he_{i/j}-NOM class in best smartest-COMP believes
 ‘Peter believes that he is the smartest in the class.’
 b. Peter_i -nun [**pro**_{i/j} pan-eyse ceyil ttokttokhata]-ko mitnunta.
 Peter_i-TOP (he_{i/j}) class in best smartest-COMP believes
 ‘Peter believes that (he) is the smartest in the class.’

In non-*pro*-drop languages such as English, the OPC does not apply as there is no overt vs. *pro* distinction in the grammar. The interpretation of null embedded clause subjects in Korean shares the same interpretation as overt embedded clause subjects in English. It needs to be pointed out that the application of the OPC in Korean differs from that of Spanish in the case where overt pronouns in East Asian languages cannot be bound, even though an intermediate bound *pro* appears in the sentence (Montalbetti 1984; Hong 1986), as in (18).

- (18) a. Nwukwuna_i -ka [**ku***_i -ka ttokttokhay-ss-ta -ko [**pro**_i malhayssta-ko]]
 everyone_i-NOM he*_i-NOM smart-PAST-DECL-COMP (he_i) said-COMP
 sayngkakhayssta.
 thought
 ‘Everyone thought that (he) said that he was smart.’

- b. Nwu(kwu)_i -ka [ku*_i -ka ttokttokhay-ss-ta-ko [pro_i malhayssta-ko]]
 who_i-NOM he*_i-NOM smart-PAST-DECL-COMP (he_i) said-COMP
 sayngkakhayss-ni?
 thought-Q
 ‘Who thought that (he) said that he was smart?’

Montalbetti also proposed the version of the OPC in East-Asian languages (initially Japanese and Chinese) as “*overt pronouns cannot have formal variables as antecedents*” (Montalbetti 1984: 187). In the Spanish equivalents of the above examples, the overt pronoun can be bound by the quantified or *wh*-word expressions (see example 11). Unlike Spanish, overt pronouns in Korean must not have quantified or *wh*-phrase DPs as antecedents, despite the presence of the intermediate bound *pro*. This means that no matter how many null pronouns occur in the construction, the OPC prohibits the bound interpretation from the overt pronouns.

Additionally, Korean and Spanish are similar in that they permit null subjects; however, the former also allows null objects while the latter does not. That is, Spanish only allows *pro* in subject position.²² The OPC is operative in null-subject languages such as Korean and Spanish since its relevance only obtains when the particular grammar instantiates an alternation between null and over pronominals. Yet there seems to have some differences in its application between these two types of languages; the restrictions on overt pronouns seem to be stronger in Korean than in Spanish. Since the overt/null pronoun alternation is also occurred in object position in Korean, the same OPC restriction may be observed when the object is a pronoun (e.g. Hong 1985, 1986), which is the topic of the next section.

3.3.2 The Overt Pronoun Constraint in object position

The examples in (19) show the distributional properties of the OPC with the overt object pronoun in Korean followed by the quantified or *wh*-phrase contexts.

²² Spanish allows phonetically null objects in very restricted contexts (see Campos 1986) but these are not instance of *pro*, but rather a variable via a topic-operator movement, as pointed out by Jason Rothman (personal communication).

- (19) a. Motun haksayng_i -un [Peter-ka **ku**_{*i/j} -lul ttaylyessta]-ko malhayssta.
 Every student_i-TOP Peter-NOM him_{*i/j}-ACC hit-COMP said
 ‘Every student said that Peter hit him.’
- b. Nwu(kwu)_i -ka [Peter-ka **ku**_{*i/j} -lul ttaylyessta]-ko malhayss-ni?
 who_i-NOM Peter-NOM him_{*i/j}-ACC hit-COMP said-Q
 ‘Who said that Peter hit him?’

In (19a) and (19b), the overt object pronoun *ku* ‘him’ in the embedded clause cannot take the quantified matrix subject *motun haksayng* ‘every student’ or the *wh*-word *nwukwu* ‘who’, as its antecedent. As predicted by the OPC, the overt object pronoun of the embedded clause cannot be bound to the quantifier or the *wh*-word of the matrix clause, but has to refer back a referent outside the sentence. Thus, the overt pronoun *ku* in (19a) and (19b) can only have a referential disjoint reading. Conversely, there is no restriction on the bound variable interpretation in English, as seen in (20a) and (20b).

- (20) a. Who_i said that Peter hit him_{i/j}?
 b. Every student_i said that Peter hit him_{i/j}

The following LF-representations distinguish between a bound variable reading and a disjoint reading. The two readings (21a) and (21b) below correspond to two interpretations for sentence (20b). The semantic representation in (21a) provides a bound interpretation where a pronoun is bound by a quantifier and the LF-representation in (21b) shows a disjoint reading, referring to ‘Bill’ (or some other person) in the discourse.

- (21) a. bound variable reading: $\forall x[(\text{student}(x) \rightarrow \text{said}(x, \text{hit}(\text{Peter}, x))]$
 b. disjoint reading: $\forall x[(\text{student}(x) \rightarrow \text{said}(x, \text{hit}(\text{Peter}, \text{Bill}))]$

Like the overt subject pronoun binding in the QDP/*wh*-phrase contexts, the OPC blocks a bound interpretation between a quantified or *wh*-word matrix subject and an

embedded overt object pronoun. Alternatively, sentences of the same type with null embedded objects can have bound variable interpretations, as in (22a) and (22b).

- (22) a. Motun haksayng_i -un [Peter-ka **pro**_{i/j} ttaylyessta]-ko malhayssta.
 every student_i-TOP Peter-NOM (him_{i/j}) hit-COMP said
 ‘Every student said that Peter hit (him).’
- b. Nwu(kwu)_i -ka [Peter-ka **pro**_{i/j} ttaylyessta]-ko malhayss-ni?
 who_i-NOM Peter-NOM (him_{i/j}) hit-COMP said-Q
 ‘Who said that Peter hit (him)?’

If the matrix subject is not a quantifier but a referential DP, the embedded object pronoun (whether this is overt or null) can take a bound variable interpretation or a referential disjoint interpretation, as illustrated in (23a) and (23b). There is no interpretive difference in this type of sentence between Korean and English.

- (23) a. Peter_i -nun [John-i **ku**_{i/j} -lul ttaylyessta]-ko malhayssta.
 Peter_i-TOP John-NOM him_{i/j}-ACC hit-COMP said
 ‘Peter said that John hit him.’
- b. Peter_i -nun [John-i **pro**_{i/j} ttaylyessta]-ko malhayssta.
 Peter_i-TOP John-NOM (him_{i/j}) hit-COMP said
 ‘Peter said that John hit (him).’

This section has shown that the OPC applies in object position as it does in subject position because a null object (*pro*) has been argued to be available in East-Asian languages (particularly Korean and Japanese) (e.g. Cole 1987; Speas 1996; Zushi 2003). However, in the case of Chinese, there is no consensus on whether this null argument is a pronominal or a variable. Chinese does allow an object to be empty, but such a null object is not treated as a *pro* (Huang 1984, 1989, 1991). According to Huang (1984), a null object is assumed to be a variable which is locally A’-bound by a null topic operator, whose reference is fixed in the discourse. Hence, a null object in Chinese is

not a null pronoun, *pro* as it cannot be bound by any matrix argument as in (24a); instead, it is co-referential with the discourse topic as in (24b).

- (24) a. Zhangsan_i shuo [Lisi bu renshi $e_{*i/j}$]
 Zhangsan say Lisi not know
 ‘Zhangsan_i said that Lisi did not know (him_{*i/j}).’
 b. Neige ren_i Zhangsan shuo Lisi bu renshi e_i
 that man Zhangsan say Lisi not know
 ‘That man_i, Zhangsan said Lisi didn’t know e_i .’
 (Huang 1984: 542)

Aoun & Li (1989) and Huang (1991) have also observed that the OPC does not apply when the pronoun occurs in object position as in (25a) and (25b). This supports the fact that a *pro* cannot appear in object position in Chinese.

- (25) a. Meigeren_i dou [x_i shuo [Lisi xihuan ta_i]]
 everyone all say Lisi like him
 ‘Everyone said that Lisi likes him.’
 (Aoun & Li 1989: 154)
 b. Shei_i xiwang [Lisi hui kanjian ta_i ?]
 who hope Lisi will see him
 ‘Who hopes that Lisi will see him?’
 (Huang 1991: 68)

Although existing analyses of null objects in Chinese have not reached an agreement (see Xu 1986; Cole 1987), null objects in Korean and Japanese are typically classified as *pro*²³ (e.g. Yang 1985, 1988; Hong 1986; Cole 1987; Moon 1989; Speas 1996; Zushi

²³ Researchers who support the *pro* analysis in terms of null arguments are based on Chomsky’s (1982: 81) definition: “ α is a *pronominal* if and only if it is free or locally A-bound by with an independent θ -role.” For example:

Peter_i -nun Sue-ka \emptyset_i /ku_i/caki_i -lul kwoylophiessta-ko malhayss-ta.
 Peter_i -TOP Sue-NOM \emptyset_i /him_i/self_i -ACC annoy-COMP said
 ‘Peter said that Sue annoyed \emptyset /him /self.’

2003). Accordingly, the OPC should apply to *pro* in object position as in subject position. Just like the OPC in subject position as shown in (14), the OPC does not allow a bound interpretation between the QDP/*wh*-phrase matrix subject and the embedded object pronoun in (19). The crucial point is that the OPC is not operative when the embedded overt pronoun is null, as shown in examples (16) and (22). A sentence-internal antecedent is also available for the embedded overt object pronoun when the matrix subject is a referential DP, as seen in (23a).

One important observation here is that not only a null pronominal but also a reflexive in place of an overt pronoun in East Asian languages (e.g. *caki* in Korean, *zibun* in Japanese, and *ziji* in Chinese) can be bound to a QDP/*wh*-word. That is, if we replace *ku/kunye* with *caki* in the quantified context, *caki* can be construed as a bound variable reading. Consider the following examples:

(26) Quantified contexts with reflexive pronoun *caki*:

- a. Nwukwunka_i -ka [**caki**_{i/*j} -ka ttokttokhata]-ko malhanta.
 someone_i-NOM self_{i/*j}-NOM smart-COMP says
 ‘Someone says that he (or she) is smart.’
- b. Nwu(kwu)_i -ka [**caki**_{i/*j} -ka ttokttokhayssta]-ko malhayss-ni ?
 who_i-NOM self_{i/*j}-NOM smart-COMP said-Q
 ‘Who said that he (or she) was smart?’
- c. Nwukwunka_i -ka [Peter-ka **caki**_{i/*j} -lul ttaylyessta]-ko malhayss-ta.
 someone_i-NOM Peter-NOM self_{i/*j}-ACC hit-COMP said
 ‘Someone said that Peter hit him (or her).’
- d. Nwu(kwu)_i -ka [Peter-ka **caki**_{i/*j} -lul ttaylyessta]-ko malhayss-ni?
 who_i-NOM Peter-NOM self_{i/*j}-ACC hit-COMP said-Q
 ‘Who said that Peter hit him (or her)?’

The null object in the above example is A-bound by the matrix subject, *Peter*, and it bears its own theta role which is base-generated. Therefore, the null object is a *pro* but not a variable.

The Korean reflexive pronoun *caki* has no restriction in locality, which may be nonlocally bound (where it is the subject of a matrix clause), and *caki* should take sentence-internal antecedents. The overt form *caki* behaves similarly with the null pronoun in bound variable contexts. Regarding the relationship between a null pronoun and a reflexive pronoun in bound variable contexts, Huang (1991) has claimed that the Chinese reflexive pronoun *ziji* is used to emphasise a null pronoun in the form of ‘*pro+ziji*’ in subject position, but not in object position. This suggests that an anaphor may also alternate with an overt pronoun in bound variable constructions. Although Montalbetti (1984) is concerned with the overt personal pronoun and *pro*, he has also been aware of the similar behaviour between a reflexive pronoun and a *pro*.

So far, I have shown that the OPC applies in both subject and object positions in Korean, which suggests that a bound variable reading is restricted to null (or reflexive) pronouns. However, some counter-examples to OPC effects have been discussed in the literature. The following example in (27) shows that the overt pronoun *ku* ‘he’ can be construed as a bound variable reading.

- (27) Nukuna_i [ku_i -lul ccocha-o-nun salam-ul] silh-e-ha-n-ta.
 Everyone_i him_i-ACC chase-come-PNE person-ACC hate-IMPERF-DECL
 ‘Everyone_i hates the person who chases him_i.’
 (Kang 1988: 194)

Furthermore, unlike the behaviour of the OPC in Korean, Kang (1988) argues that the bound variable reading of the overt pronoun *ku* ‘he’ (or *kukes* ‘it’) produces marginality in colloquial speech as in (28) since the distribution of the pronominals is controlled by some additional factors such as pragmatics.

- (28) ??Nuku-na_i [ku_i-ka hyunmyungha-ta-ko] saengkakha-n-ta.
 Everyone he-NOM wise-DEC-COMP think-IMPERF-DEC
 ‘Everyone thinks that he is wise.’
 (Kang 1988: 193)

Noguchi (1997) further provides an account for this by claiming that *ku* in Korean is largely used as a nonhuman pronoun, such as *ku chayk* ‘that book’, thus this can function as a bound variable due to *ku* being one of the demonstratives which are determiners or D-pronouns in Korean.²⁴ In Kang (1988), *ku* is ambiguous between a specifier (i.e. *ku* + NP) and a personal pronoun because the use of personal pronoun *ku* is a relatively recent development in Korean grammar. In the case of (27), the bound interpretation seems acceptable as *ku* is embedded inside a relative clause construction. However, the marginal judgement about the use of *ku* in (28) seems to me incorrect without recourse to any relevant contexts. Interestingly, Lee (2001) claims that there are some cases where an overt pronoun can be used as a bound variable contra Montalbetti (1984). Consider the following examples in (29) and (30) (Lee 2001: 153-154).

- (29) a. *Motwu_i -nun **kunye**/**ku**_i -ka ttokttokhata-ko sayngkakhanta.
 everyone-TOP she/he-NOM intelligent-COMP think
 ‘Everyone thinks that she/he is smart.’
- b. *Motun cikwen_i -un **kunye**/**ku**_i -ka ttokttokhata-ko sayngkakhanta.
 every employee-TOP she/he-NOM intelligent-COMP think
 ‘Every employee thinks that she/he is smart.’
- c. Motun yepise_i -nun **kunye**_i -ka ttokttokhata-ko sayngkakhanta.
 every female secretary-TOP she-NOM intelligent-COMP think
 ‘Every female secretary thinks that she is smart.’
- d. Motun namhaksayng_i -un **ku**_i -ka ttokttokhata-ko sayngkakhanta.
 every boy-TOP he-NOM intelligent-COMP think
 ‘Every boy thinks that he is smart.’

²⁴ In Noguchi (1997), overt personal pronouns in English are determiners or D-pronouns, and can be interpreted as bound variables; whereas Japanese those pronouns are nouns or N-pronouns, and cannot be so interpreted. Noguchi argues that only D-pronouns enter into binding process, but not N-pronouns since they are lexical rather than functional. An example regarding the bound variable reading of D-pronouns is as follows:

Dono kaisya-mo_i [sono_i kaisya-ga itiban-da to] omotte-iru.
 every company-also its company-NOM best-COMP think-PRES
 ‘Every company_i thinks it_i is the best.’

(Noguchi 1997: 786)

- (30) a. *Nwu_i -ka **kunye_i** -uy pwumo-lul yanglowen-ey ponayssni?
 who-NOM she-GEN parents-ACC nursing home-LOC sent
 ‘Who sent her parents to a nursing home?’
- b. *Nwu_i -ka **ku_i** -uy pwumo-lul yanglowen-ey ponayssni?
 who-NOM he-GEN parents-ACC nursing home-LOC sent
 ‘Who sent his parents to a nursing home?’
- c. Etten yeca_i -ka **kunye_i** -uy pwumo-lul yanglowen-ey ponayssni?
 which woman-NOM she-GEN parents-ACC nursing home-LOC sent
 ‘Which woman sent her parents to a nursing home?’
- d. Etten namca_i -ka **ku_i** -uy pwumo-lul yanglowen-ey ponayssni?
 which man-NOM he-GEN parents-ACC nursing home-LOC sent
 ‘Which man sent his parents to a nursing home?’

Lee (2001) argues that the bound variable reading is determined by the ‘relative referentiality’ which is based on phi-features between a pronoun and a quantifier DP, very much hinted at by Lasnik (1991). Lasnik (1991) proposed a referential hierarchy (e.g. R-expression > pronoun > anaphor), which is that a less referential expression cannot bind a more referential one. For Lee (2001), the limited range of the bound variable reading is possible, only provided that pronouns are not more referential than quantifier DPs. For example, the overt pronouns in (29a) and (29b) are more referential than the quantifiers; that is, *motwu* ‘everyone’ and *motun cikwen* ‘every employee’ have defective phi-features (3rd and singular), whereas the overt pronouns *kunye* and *ku* (3rd, singular, and female) are fully specified in phi-features. Thus, the sentences in (29a) and (29b) are not allowed a bound variable reading, since the overt pronouns *ku* and *kunye* are more referential than quantifier DPs *motwu* and *motun cikwen*. On the contrary, in the cases of (29c) and (29d), the quantifiers *motun yepise* ‘every female secretary’ and *motun namhaksayng* ‘every boy’ are fully specified in phi-features like the overt pronouns *kunye* and *ku*. Therefore, the bound variable reading is acceptable as the overt pronouns are not more referential than quantifiers. Similar accounts can be applied to the examples in (30). Furthermore, the author argues that if the overt pronouns are replaced with featureless *pro* or *casin* ‘self’, the OPC effects disappear due to the notion

of referentiality. This indicates that non-referential *pro* and anaphor can always receive a bound variable reading, since their phi-features are deficient (unspecified in person and gender features). If Lee’s analysis is correct, then the bound variable reading should also be possible in object position, as in (31b) and (31d):

- (31) a. *Motwu_i -nun [Mary-ka **ku_i** -lul coahanta]-ko mitnun_{ta}.
 everyone_i-TOP Mary-NOM him*_i-ACC like-COMP believe
 ‘Everyone believes that Mary likes him.’
- b. Motun namca_i -nun [Mary-ka **ku_i** -lul coahanta]-ko mitnun_{ta}.
 every man_i-TOP Mary-NOM him_i-ACC like-COMP believe
 ‘Every man believes that Mary likes him.’
- c. *Nwu(kwu)_i -ka [John-i **kunye_i** -lul coahanta]-ko malhayss-ni?
 who_i-NOM John-NOM her*_i-ACC like-COMP said-Q
 ‘Who said that John likes her?’
- d. Etten yeca_i -ka [John-i **kunye_i** -lul coahanta]-ko malhayss-ni?
 which woman_i-NOM John-NOM her_i-ACC like-COMP said-Q
 ‘Which woman said that John likes her?’

I will not pursue Lee’s proposal any further, though it seems plausible to consider the OPC in terms of the relative referential hierarchy between a binder and a bindee. However, it is not perhaps particularly clear under this analysis why this author’s relative referentiality cannot function in English and why there is a difference between English and Korean. If the bound variable reading is subject to the amount of phi-features in Korean, then it is also questionable whether this can be applied to any other pro-drop language. In the following section, I will review existing L2 research of the OPC and consider evidence as to whether English native speakers have access to UG and consequently have nativelike representations of the target grammar in this domain.

3.4 Previous L2 acquisition studies of the Overt Pronoun Constraint

Several researchers have investigated the acquisition of the OPC in L2 Japanese (Kanno 1997, 1998; Marsden 2002a), Spanish (Pérez-Leroux & Glass 1999; Lozano 2002; Rothman & Iverson 2007a, b; Rothman 2009), and Turkish (Gürel 2003, 2006).

3.4.1 Kanno (1997)

Kanno (1997) first examined whether adult English speakers have knowledge of the interpretive constraint on quantified and *wh*-antecedents for overt pronouns in L2 Japanese. The participants consisted of 28 native speakers of English who were enrolled in the fourth semester of Japanese as a foreign language at the University of Hawaii; 20 adult native speakers of Japanese served as a control group.²⁵ Participants' knowledge of the OPC was tested using a co-reference judgment task which consisted of four sets of bi-clausal sentences with each five tokens. The test sentence types in the task that Kanno used are exemplified as below:

(32) a. OPC context [QDP_i + overt_i/null_i]

Dareka_i ga [**kare**_i/***pro**_i ga Suuzan o sitteiru to] itteimasita yo.
someone_i-NOM he_i/**pro*_i-NOM Susan-ACC know that was-saying
'Someone was saying that he knows Susan.'

b. Referential context [RDP_i + overt_i/null_i]

Tanaka_i -san wa [raisyuu **kare**_i/***pro**_i ga Tokyoo e iku to] iimasita yo.
Tanaka_i-Mr-TOP next-week he_i/**pro*_i-NOM Tokyo to go that said
'Tanaka said that he would go to Tokyo next week.'

The participants were presented with a sentence-comprehension task followed by given contexts to indicate whether the embedded overt pronoun can co-refer with the matrix subject or with some other person from the discourse, for example:

²⁵ Kanno (1997) acknowledged that she did not measure participants' overall proficiency and their proficiency level was assumed not to have reached an advanced level yet.

(33) Overt pronoun with quantified DP as antecedent [QDP_i + overt_{*i}]

Context: Dareka ga **kare** ga Suuzan o sitteiru to itteimasita yo.

someone-NOM he-NOM Susan-ACC know that was-saying

‘Someone was saying that he knows Susan.’

Question: Dare ga Suuzan o sitteiru n desyoo ka?

who-NOM Susan-ACC know that suppose Q

‘Who do you suppose knows Susan?’

a. same as *dareka*

b. another person

The participants were asked to answer the questions by indicating options ‘a’, ‘b’, or ‘both a and b’. All instructions were written in English, but the test sentences were presented in the standard Japanese script. The test results for Kanno (1997) are shown below:

Table 1: Acceptance rates of overt and null selected in Kanno (1997) (∅=null argument)

Type of the sentence	L2 learners (n=28)		Native Japanese (n=20)	
	bound or both (%)	disjoint only (%)	bound or both (%)	disjoint only (%)
QDP + ∅	78.5	21.5	83	17
QDP + <i>kare</i>	13	87	2	98
RDP + ∅	81.5	18.5	100	0
RDP + <i>kare</i>	42	58	47	53

(Kanno 1997: 272-273)

The rationale of the task was that, if participants use their L1 grammar to complete this task, they would not differentiate between the bound and the disjoint interpretations in QDP/*wh*-word contexts. In contrast, if L2 speakers select the disjoint reading in OPC sentences and reject the bound reading, this would be a signal of the instantiation of the OPC. The results of the study showed that L2 learners exhibited a significant difference between null and overt pronominals when they were bound by a QDP/*wh*-phrase. In addition, Japanese native controls interpreted the overt embedded clause subject pronoun *kare* ‘he’ as being co-referential with QDP antecedents only 2% of the time

whereas they interpreted null embedded clause subject pronouns as co-referential with QDP antecedents at 83%. Furthermore, the L2 learners exhibited a pattern analogous with that of the control group, even though there was some individual variation. The L2 learners favoured null pronouns (78.5%) over overt pronouns (13%), when the bound reading was accepted in QDP/*wh*-word contexts.

Kanno (1997) conducted an additional experiment in order to explore the possibility that the L2 learners' high rate of the rejection for overt pronouns in quantified/*wh*-word contexts could be due to the influence from English. All the test sentences were in English. The informants showed a strong preference for a sentence-internal antecedent (over 85%) in both quantified and referential contexts with overt pronouns in their L1. Thus, Kanno concludes that the preference for the sentence-external antecedent in the main experiment is not due to their L1, and that it can only be explained from UG-instantiated knowledge of the OPC. Other interesting results based on Kanno's experiment are the acceptance rate on RDP contexts by Japanese native controls, as seen in Table 1. Japanese controls did not allow sentence-external antecedents at all (0%) in RDPs with null pronouns. However, as Kanno indicated in the study, null or overt pronouns as referential antecedents are both possible, but they have preferred null pronouns over overt pronouns. Even though Kanno's finding indicates that both native controls and L2 learners obey the OPC, they all have also demonstrated null pronoun preference, irrespective of test sentence types.

Kanno also examined the individual results in selecting the disjoint interpretation only in QDP/*wh*-word contexts with overt pronouns. The author regarded L2 participants who chose the disjoint reading only in QDP/*wh*-word contexts with overt embedded subject pronouns in at least four times out of five tokens as consistent acquirers of the OPC. 100% of the Japanese natives and 86% of the L2 speakers fall into this category. Based on this result, Kanno claimed that the analysis of the individual results also revealed a similar pattern with the group results for the L2 learners and the native Japanese speakers. However, looking more closely at the individual responses, only 54% of the L2 participants correctly answered all sentences in QDP/*wh*-word contexts with overt embedded subject pronouns, whereas 90% of the native Japanese speakers rejected a bound reading in all five items in this sentence type. Kanno's categorisation

for consistency does not seem to reflect the existing individual learners' variability. The performance of the L2 speakers is clearly far from that of the native controls. There seems to be a certain degree of variation within the L2 group in respect to knowledge of the OPC but the author discards L1 transfer as a possible explanation. Overall, Kanno concludes that the L2 learners' OPC knowledge embodies clear evidence for "*continued access to UG*" (1997: 279). Similar results were also supported in Kanno's (1998) study.²⁶ Marsden (2002a) replicated Kanno's (1998) study, testing English speakers of Japanese divided into three groups according to the length of instruction, confirming that L2 speakers' OPC performance increases with their level of proficiency.

Sheen (2000), however, contests Kanno's (1998) results.²⁷ According to Sheen, it is possible that non-native speakers and native speakers may well interpret the same forms or have similar grammatical judgments and intuitions, but for different reasons. This author's major objection to Kanno's results is the claim about problem-solving skills: namely, a "*kare rule*" (Sheen 2000: 803).²⁸ Sheen claims that the '*kare rule*', where *kare* takes a sentence-external antecedent, can be inferred from general problem-solving mechanisms. This author argued that the 'problem-solving skill' proposal provides a more plausible explanation for the L2 learner's performance rather than Kanno's conclusion of access to UG. Sheen (2000) conducted tests 'informally' with three different groups similar to Kanno's (1998) in order to prove his assertion. Based on the results, Sheen argues that the '*kare rule*' encourages L2 learners to select sentence-external antecedents in QDP sentences with overt pronouns, whereas there is a tendency to choose sentence-internal antecedents in RDP sentences with null pronouns. He further claims that this different selection of the antecedent between these two sentence types can be accounted for by L1 influence. In order to strengthen his claims, not only

²⁶ In Kanno (1998), the group results did not replicate individual results, thereby showing variability, unlike the previous study. The L2 speakers were tested at two different times with a twelve-week interval between the two test sessions. In group results, the L2 learners' performance of the OPC was consistent across the two test sessions; however, in individual results, their behaviour towards the OPC was not consistent across learners or over two sessions.

²⁷ For more debate of Kanno's (1997) findings, see Kellerman & Yoshioka (1999) and Sheen (2000).

²⁸ Sheen (2000) raises a doubt about Kanno's (1998) assertion of which native English speakers in the experimental group had never encountered the OPC. This is because they are in the fourth-semester Japanese course and they already had 160 hours lesson times by the time when they were tested. Hence, he argues that it is unlikely that they encountered these kinds of sentences for the first time in a pen and pencil test, triggering the OPC effect through access to UG.

did this author conduct the experiment for non-null-subject language speakers, but also examined native speakers of Korean. 6 Korean graduate students in Japan took a test similar to Kanno's. Indeed, the OPC is part of grammar in Korean, since Korean is one of the null-subject languages. However, the result of the Korean participants' experiment for the OPC showed that only 24% of them chose sentence-external DPs as antecedents in [QDP+overt pronoun] type, which is distinct from that of Kanno's study. Sheen argues, based on the feedback from a few Korean linguists, that Korean permits the overt pronoun to refer both to a quantified DPs in the matrix clause and to a sentence-external antecedent, depending on contextual variables. On the basis of this result, Sheen claims that both bound and disjoint antecedents are allowed in certain Korean contexts.

Looking at Kanno's stimulus sentences in QDP/*wh*-word contexts with overt pronouns, however, we see that no pragmatic or discourse cue is provided. In this case, only disjoint reading is possible in Korean. It is surprising to me that 75% of the Korean students selected a bound variable interpretation in this sentence type. Since Sheen did not provide any detailed description of the experiments conducted with Korean students, it is difficult to account for the reason why the Korean students show this unexpected behaviour. Furthermore, it is not clear where the '*kare* rule' comes from and how L2 learners use this rule. The syntactic behaviour of the overt pronoun may reside in Condition B of the binding theory, which states that a pronominal is free in its governing category (Chomsky 1981). Sheen's general problem-solving skills, namely '*kare* rule', with interaction of L1 influence do not seem to provide a solution against Kanno's finding (for more detailed discussion, see Marsden 2002b).

3.4.2 Pérez-Leroux & Glass (1999)

Pérez-Leroux & Glass (1999) investigated L2 speakers' developmental patterns in the acquisition of null pronouns in quantifier-binding contexts by English-speaking learners of Spanish.²⁹ 78 English L2 learners of Spanish at three proficiency levels (elementary, intermediate, and advanced learners) and a group of 20 native speakers of Spanish

²⁹ These authors conducted two studies: one involving syntactic properties of the OPC and the other involving discourse properties of topic and focus. This paper only focuses on the first study.

participated in the experiment. A sentence translation task was employed; learners were presented with a set of 8 English stories followed by a sentence which they were asked to translate from English into Spanish. It was hypothesised that if L2 speakers are sensitive to the OPC in L2 Spanish, they would correctly produce null subjects since the given story was biased to favour a co-reference interpretation. The task L2 learners were presented involved contexts in (34):

(34) OPC contexts

The court charged that some journalists had been in contact with the jurors. Several of them were questioned by the judge.

To translate: No journalist admitted that he had talked to the jurors.

Prompt: Pero ningún periodista . . .

The aim of this test was to examine how participants translate a null subject or an overt subject in accordance with given contexts. For example, the expected target translation in (34) is to translate from *he* into *pro* because the given sentence only allows a bound variable reading where the overt pronoun must be co-referential with a QDP. The results of the experiments are shown in Table 2.

Table 2: Percentages of overt, null, and other responses produced in Pérez-Leroux & Glass (1999)

	Bound-variable stories			Referential stories		
	Null	Overt	Other	Null	Overt	Other
Elementary (n=39)	57.7%	34.0%	8.3%	21.2%	67.9%	10.9%
Intermediate (n=21)	73.8%	26.2%	0.0%	35.7%	59.5%	4.8%
Advanced (n=18)	93.1%	0.0%	6.9%	58.3%	31.9%	9.7%
Native controls (n=20)	85.0%	13.7%	1.3%	31.3%	67.5%	1.3%

(Pérez-Leroux & Glass 1999: 234)

Their results indicate that all three different proficiency groups produced more null subjects than overt subjects in quantified contexts with overt pronouns. In addition, their

use of null pronouns increased according to L2 speakers' proficiency levels. One of the interesting results was that there was a tendency to favour overt pronouns over null pronouns in referential contexts. This result is contrary to Kanno (1997, 1998). The difference between these two studies may be due to task differences. A translation task is an elicited production task and it is possible that the lower level learners may have translated the given sentences word by word. Accordingly, it is plausible that they are likely to prefer producing overt pronouns to null pronouns in referential stories.

To summarise, the overall results are similar to those reported by Kanno (1997, 1998) and are consistent with the claim that L2 learners demonstrate knowledge of the OPC in a second language (a statistical analysis on individual results is not provided in this case). Even the elementary group shows sensitivity to the OPC, which these authors interpret as revealing that "*the OPC is operative at all stages in the acquisition of Spanish*" (Pérez-Leroux & Glass 1999: 235). It is, however, important to note that as a result of how the translation task was set up, even if L2 speakers produce the expected translation, this does not actually involve the crucial phenomenon of the OPC, i.e. knowledge that the overt pronoun cannot be bound by the QDP/*wh*-word matrix subject.

3.4.3 Rothman & Iverson (2007a, b) and Rothman (2009)

Rothman & Iverson (2007a, b) and Rothman (2009) analysed the OPC as part of the cluster of properties linked to the null-subject parameter.³⁰ That is, they argue that, if L2 speakers can reset the [-pro-drop] setting of English to the [+pro-drop] setting of Spanish, then knowledge of the OPC should automatically obtain. Such an assumption seems to be a conceivable explanation as to why OPC knowledge comes for free in L2 grammars.

Rothman & Iverson (2007b) tested 30 intermediate L2 learners and 20 Spanish natives using a sentence formation task and two OPC tasks (a co-reference judgment task and a context translation task) in order to examine L2 speakers' resetting of the null-subject

³⁰ It was originally proposed that the null-subject parameter comprises a set of properties (e.g. null subjects, null expletives, *that*-trace effect, and VS inversion) that are claimed to cluster together (Chomsky 1981; Jaeggli 1982; Rizzi 1982).

parameter.³¹ Their findings show that although group results indicate that L2 speakers' OPC knowledge obtains via resetting of the null-subject parameter³², individual data reveal variation within the learner group. Perhaps the most interesting part of their study is that they were able to show the existence of individual variation. They found that one-third of L2 learners (10 out of 30 L2 speakers) did not exhibit knowledge of the OPC, while 20 learners demonstrated nativelike knowledge of the OPC. In consequence, these authors proposed that those 10 learners did not reset the null-subject parameter at the point in interlanguage development that they were tested at. However, amongst those 20 intermediate learners who are claimed to be shown nativelike representations of the OPC, 17.5% of the learners at interval 1 (before a study-abroad experience) and 19.5% of the learners at interval 2 (after a study-abroad experience) incorrectly chose a bound interpretation, whereas only 9% of the Spanish natives selected this option. The choice on the bound interpretation clearly indicates that 17.5% and 19.5% of the L2 learners at interval 1 and 2 do not abide by the OPC restriction, thereby showing further variation.

Rothman (2009) extended his own previous research (2007a, b) to account for the distribution of overt and null subject pronouns in L2 Spanish.³³ In this study, a group of 23 advanced and 38 intermediate English speakers were included. In accordance with the results of the OPC experiment (co-reference interpretation task modelled after Kanno 1997, 1998), the advanced learners performed like the Spanish native controls in the response of both bound (e.g. advanced learners: 7.4%, Spanish controls: 5.3%) and disjoint readings (e.g. advanced learners: 89.6 %, Spanish controls: 89.3%). However, the intermediate learners did not converge with the Spanish controls in the response of a bound reading (e.g. 25.8%). The author pointed out that although the L2 intermediate group exhibited sensitivity to the OPC (88.4%), there was a significant native/non-

³¹ The main purpose of Rothman & Iverson's (2007a, b) studies is to investigate whether naturalistic input is beneficial to L2 learners. The authors have found that no group improvement on the null-subject parameter resetting is observed at five-month intervals before and after a study-abroad experience. For expository reasons, I have just reviewed a co-reference judgment task of the second paper (2007b).

³² The L2 learners and the Spanish natives exhibited a similar performance on the disjoint interpretation; 76.5% of the L2 learners at interval 1, 83% of the L2 learners at interval 2, and 76.5% of the Spanish natives selected a disjoint reading in QDP/*wh*-matrix clause subject sentences with overt embedded subject pronouns.

³³ The purpose of the study is to examine the syntax-pragmatics interface and whether this is particularly vulnerable in adult L2 acquisition. I have only observed the OPC-related study.

native difference in bound variable interpretations. In order to explore learner variation for the intermediate group, this group was divided into two subgroups: i) an OPC group whose result is a range of the Spanish control group (n=28) and ii) a non-OPC group whose performance is below chance levels (n=10). While the response pattern of the 28 intermediate L2 learners was nativelike, showing 7.9% of the time in the bound interpretation, the remaining 10 learners from the intermediate group did not demonstrate knowledge of the OPC. These 10 intermediate learners were removed from the rest of the tasks. The OPC subgroup in the intermediate group and the advanced group participated in the final two tasks since only those learners were assumed to have reset the null-subject parameter.³⁴

Examination of the individual analysis in Rothman & Iverson (2007a, b) and Rothman (2009) has clearly shown that the group results unintentionally concealed learner variability, resulting in only a tendency of the OPC effect. An interesting point in their studies is that the OPC determines the underlying syntax for the null-subject parameter with null subjects and expletive subjects.³⁵ What is evident from these studies is that L2 speakers can acquire relevant features that license and identify *pro*. Since *pro* is acquired by these learners, the OPC naturally follows and need not be learnt. The learners' accurate interpretations on the OPC, being a POS property, are taken as strong evidence that the null-subject parameter has been reset. Although the issue of the instantiation of the OPC via the resetting of the null-subject parameter is not a purpose of the current study, Rothman & Iverson and Rothman's argument regarding the OPC as a cluster of properties appear to possibly explain how this knowledge has come to function in L2 speakers.

³⁴ In the remaining two tasks, the intermediate learners who demonstrate knowledge of the OPC have not acquired language-particular pragmatic conditions that regulate null/overt subject distributions. However, the advanced learners have demonstrated nativelike intuitions with respect to overt/null alternations in pragmatic constructions. In consequence, Rothman points out that L2 speakers are sensitive to the syntax of null subjects before the pragmatic distributions.

³⁵ Rothman & Iverson (2007a, b) have pointed out that the original cluster of properties of the null-subject parameter is not accurate. The null-subject parameter properties consist only of the licensing of null-subjects, obligatorily null expletive subjects, and the OPC. Accordingly, the other properties such as VS inversion and *that*-trace effects are not clustered properties of the null-subject parameter since they can be achieved from the input directly. They argue that if the null-subject parameter is reset, these three clustered properties automatically ensue.

3.4.4 Gürel (2003, 2006)

While the OPC has been regarded as a universal phenomenon, Gürel (2003, 2006) has raised an objection in terms of the universality of the OPC. She claims that formal properties of overt/null pronouns in Turkish do not provide interpretative differences between overt and null pronouns in the same way proposed by Montalbetti's OPC. In Turkish, an embedded null pronoun (or a reflexive pronoun) can either be co-referential with any type of matrix clause subject or refer to some other third party. However, an embedded overt pronoun cannot always be bound by a matrix subject, irrespective of a quantified DP or referential DP matrix subject, thereby allowing only a disjoint reading (see Turkish examples 35). That is, Turkish is different from other pro-drop languages such as the Spanish-type and the Korean-type since an overt pronoun in Turkish cannot be bound even by a referential antecedent. Consider the following examples in Turkish:

- (35) a. Elif_i [o -nun *_{i/j} /ø_{i/j}/kendi-si-nin_{i/j} çok inatçı ol-duğ-u]-nu bil-iyor
Elif s/he/-GEN/pro/self-3SG-GEN very stubborn be-NOMZ-3SGPOSS-ACC know-PRG
'Elif knows (that) s/he is very stubborn.'
- b. Herkes_i [o-nun*_{i/j}/ø_{i/j}/kendi-si-nin_{i/j} dahi ol- duğ-u]-nu düşün-üyor
Everyone s/he/-GEN/pro/self-3SG-GEN genius be-NOMZ-3SGPOSS-ACC know-PRG
'Everyone thinks (that) s/he is genius.'

(Gürel 2006: 267)

Gürel claims that Turkish does not show the OPC effects, despite Turkish being a pro-drop language, because the Turkish overt pronoun *o* cannot alternate with *pro* but its overt counterpart is anaphoric pronominal *kendisi*.³⁶ In the empirical study, 28 English speakers who are L2 end-state of Turkish and 30 native Turkish speakers completed a written interpretation task, a truth-value judgment task, and a picture identification task.

³⁶ According to Gürel (2006), embedded clauses in Turkish are DPs rather than IPs, so they are not included in the governing category. Therefore, the embedded overt pronoun *o* in subject position rules out Condition B of the binding theory. In the view of Manzini & Wexler's (1987) subset relations regarding learnability, L1 English has a larger value than L2 Turkish regarding governing categories (i.e. both DPs and finite IPs constitute binding domains in English, whereas only finite IPs are counted as binding domains in Turkish). The author claims that binding for the overt pronoun *o* is not originated from the OPC, but this is responsible for the requirement of Condition B that disallows pronouns to be bound in their binding domains.

The findings from all three tasks showed that L2 speakers accepted a disjoint reading only for the overt pronoun at a relatively high percentage, which is the correct option. For instance, in the written interpretation task (adopted from Kanno 1997), the L2 speakers favoured a disjoint reading only for the overt pronoun *o* in the referential (RDP) contexts (71%) and the quantified (QDP) contexts (77%). As shown below in Table 3, the Turkish controls exclusively accepted a disjoint reading only for the overt pronoun *o* in the RDP contexts (94%) and the QDP contexts (89%).

Table 3: The results of the written interpretation task in Gürel (2006)

	Referential antecedents			Quantified antecedents		
	Overt subjects		Null subjects	Overt subjects		Null subjects
	o	kendisi	pro	o	kendisi	pro
Controls (n=30)						
Bound	1%	36%	16%	2%	32%	10%
Disjoint	94%	0%	0%	89%	0%	3%
Bnd & Dis	5%	64%	84%	9%	68%	87%
L2 speakers (n=28)						
Bound	7%	69%	32%	5%	56%	26%
Disjoint	71%	7%	12%	77%	11%	26%
Bnd & Dis	22%	24%	56%	18%	33%	48%

(Gürel 2006: 273)

However, the performance for the reflexive pronoun and the null pronoun differs between the L2 learners and the Turkish controls. The option of both readings is a correct response for the reflexive pronoun and the null pronoun in the RDP and the QDP contexts. The Turkish controls selected an option of both readings for the reflexive pronoun *kendisi* at 64% in the RDP contexts and at 68% in the QDP contexts. They also chose the correct option for the null pronoun *pro* at 84% in the RDP contexts and at 87% in the QDP contexts. However, the L2 speakers accepted a response of both readings for *kendisi* 24% of the time in the RDP contexts and 33% of the time in the QDP contexts. They selected the correct option for *pro* 56% of the time in the RDP contexts and 48% of the time in the QDP contexts. The L2 speakers had a tendency to accept a bound

reading with *kendisi* and *pro*, whereas they showed a preference for the disjoint reading only with *o*. The response pattern of the overt pronoun for the L2 group is similar to that of the control group in both contexts, even though their performance is not exactly identical.

Somewhat interestingly is that, in light of the results, Gürel (2006) concludes that L2 speakers have difficulty in acquiring the binding properties for the overt pronoun *o* and thus fail to achieve “*native norms*” (p.278) due to L1 transfer. The author argues that the overt pronoun binding *o* is determined by the requirement of Condition B, but not by the universal principle of the OPC, suggesting that “*the OPC may not be a universal property of all null subject languages*” (Gürel 2006: 279). As Gürel has claimed, the behaviour of the overt pronoun in Turkish violates Condition B of the binding theory, which may require an independent account. However, this cannot be used as an argument that the OPC does not apply as no one contends that the OPC is part of Condition B in the binding theory. As we have seen in Gürel’s findings above, the L2 speakers clearly showed a comparatively high percentage of the acceptance for the disjoint reading only towards the overt subject pronoun in both RDP and QDP contexts. Even though L2 learners’ performance in respect to binding for the overt pronoun did not reach that of the control group, this result does not seem to reveal that they have ‘failed’ to acquire the restriction on overt pronouns. More than 70% of the L2 speakers evidently display the correct interpretation with respect to the overt pronoun and thus we can assume that at least these learners know subtle knowledge of the OPC. It cannot be deniable that the syntactic distribution regarding the overt pronoun in Turkish differs from any other null-subject languages such as Korean and Spanish. The overt pronoun in Turkish blocks co-reference between matrix subjects and overt embedded subject pronouns whether or not the overt pronoun links to a bound variable. The overt pronoun binding in Turkish is more restrictive than in any other pro-drop languages. It seems likely that the OPC also applies in Turkish, showing that the OPC in Turkish is more limited than in other pro-drop languages. It is possible that if the study had provided individual data, we could have observed more systematic variation in the distribution of overt and null pronouns in L2 speakers.

In short, Gürel argues that the OPC is not a universal principle, claiming that the OPC does not apply in Turkish. However, since we have observed a certain rate of achievement for the interpretive constraint on overt pronouns by L2 speakers, this would seem to imply that OPC restrictions do operate in Turkish, contrary to Gürel's argument.³⁷

3.4.5 Summary of the L2 acquisition studies of the OPC: Universal property of the OPC

Following Montalbetti's claim on the universal property of the OPC in null-subject languages, L2 acquisition studies regarding the OPC have examined the acquisition of binding restrictions regarding overt/null pronouns in Spanish and in Japanese. Kanno (1997, 1998) and Marsden (2002a) have conducted experiments testing knowledge of the OPC by English-speakers learning Japanese. Pérez-Leroux & Glass (1999), Rothman & Iverson (2007a, b), and Rothman (2009) have studied OPC restrictions in the grammar of English-speakers learning Spanish as a second language. All these authors claim that L2 speakers acquire relevant syntactic knowledge of the OPC. Given these results, we can argue that the OPC is one of the principles of UG. There are several reasons why they propose that this is a universal property (see Kanno 1997). Firstly, knowledge of this constraint is not inferable from the L2 positive input, even in a naturalistic setting, due to the relatively low frequency of such constructions in naturally occurring language. Second of all, it is claimed that the restrictions of the OPC are not included in L2 classroom instruction (e.g. Kanno 1997, 1998; Pérez-Leroux & Glass 1999; Rothman & Iverson 2007a, b; Rothman 2009). Lastly, English speakers cannot use their own L1 as a source of OPC knowledge since this constraint is not operative in non-pro-drop languages like English.

While the OPC has been treated as a universal phenomenon, Gürel (2003, 2006) has cast doubt on the universal status of the OPC. In Turkish, an embedded overt subject pronoun can take a disjoint interpretation only (whether referential or quantified DP matrix subjects), whereas the reflexive pronoun *kendisi* or the null pronoun *pro* exhibits

³⁷ Gürel did not exclude the possibility of access to UG in L2 speakers and that L2 learners' divergent performance is stemmed from binding restrictions of English, which is mediated by UG.

no restriction in their binding properties. Gürel claims that the Turkish overt pronoun *o* does not follow the original term of the OPC since the overt pronoun is not a counterpart of *pro*, but a reflexive pronoun *kendisi*. However, in the study, interpretative differences have been shown between the overt pronoun *o* and the null pronoun *pro* and between the overt pronoun *o* and the reflexive pronoun *kendisi*. The restriction affecting the overt pronoun in Turkish may be subject to an OPC effect. Another objection regarding the universality of the OPC comes from Hawkins (2008). In the words of Hawkins (2008: 469):

[T]he OPC is a rather stipulative and construction specific constraint that does not fit well with recent attempts within the spirit of the minimalist program to identify more general principles of UG. [...] The OPC would seem to be something of an analytic convenience, describing a phenomenon that surely follows from a more general principle determining the distribution of non-referring expressions.

Our discussion is based on the assumption that the OPC is a universal phenomenon. However, after the emergence of the Minimalist Program, as Hawkins has indicated, the OPC has a problem in which the assumption is no longer valid since the Minimalist account eliminates a modular grammar of UG. As claimed by Hawkins (2008), the OPC may be a general restriction or a superfluous constraint to explain a descriptive contrast between overt and null pronouns in certain languages. However, whatever the formation of the OPC, the most crucial point of the OPC is that L1 and L2 speakers' OPC knowledge can only be observed when UG is involved in the process of their language acquisition. There would be nothing to explain this learnability problem if L2 learners do not have access to UG. Although Hawkins has criticised the limitation of the OPC, he has also acknowledged the fact that L2 learners' knowledge of the OPC is only explained by postulating that L2 interlanguage grammars are constrained by UG. Further research is necessary to illuminate this interesting debate.

3.5 Summary of Chapter 3

In this chapter, I have analysed interpretive differences between an overt and a null embedded pronoun in quantified/*wh*-phrase matrix subject contexts in Korean. This chapter has also looked at the original formation of the OPC proposed by Montalbetti (1984) and has identified similarities and differences between Korean and Spanish. Abstract knowledge of the OPC with respect to the distinction between overt and null pronouns is claimed to arise from a universal constraint, a principle of UG. This contrastive behaviour between overt and null pronouns in quantifier-binding environments provides a case of the poverty-of-the-stimulus phenomenon. This is because the native grammar, i.e. English, does not contain such restrictions and because L2 speakers cannot rely on L2 input alone to acquire the complexities involved in the distinction between overt and null pronouns due to the very low frequency of the relevant forms in the input and apparent lack of relevant instruction.

Previous L2 acquisition studies (e.g. Kanno 1997, 1998; Pérez-Leroux & Glass 1999; Marsden 2002a; Rothman & Iverson 2007a,b; Rothman 2009) have demonstrated that L2 speakers show sensitivity to the OPC in their response to overt pronouns with quantified or *wh*-word antecedents versus null pronouns with quantified or *wh*-word antecedents. In contrast to these findings, Gürel claims that the OPC is not instantiated in Turkish. Although, in Turkish, the restriction with respect to what the pronoun can refer to is limited to not only quantified or *wh*-phrase contexts but also referential contexts, the L2 learners have made a significant distinction between the overt and the null (or reflexive) pronouns across different sentence types. What is important in her study is that it may not be possible to account for the relatively high percentage of the L2 speakers' achievement without postulating UG. The findings so far in the previous studies suggest that although grammatical properties of the OPC have shown POS effects, L2 speakers' knowledge of the OPC is constrained by UG.

Previous L2 studies of the OPC have examined L2 learners' knowledge of the OPC in subject pronoun position but not in object pronoun position. Since the OPC in Korean rules out overt bound pronouns from subject position as well as from object position, it is possible to use this language to test whether English L2 speakers of Korean

demonstrate nativelike representations of the OPC in both positions. This constitutes the goal of the empirical study presented in Chapter 5.

CHAPTER 4

ANAPHORIC BINDING IN L2 ACQUISITION

This chapter is devoted to structural properties of anaphor binding in English and Korean and a literature review of the L2 acquisition of reflexive binding. It should be noted that some parts of this chapter have appeared in *Language Acquisition* (2012) co-authored with Domínguez and Hicks. In the first place, I introduce a brief theoretical development of Binding Theory (BT), which deals with syntactic conditions on referential properties of nominal elements. Then, I proceed to present a current analysis of anaphoric binding in English and Korean under the feature-based Minimalist assumptions based on Hicks (2009). Finally, this chapter reviews previous L2 acquisition studies on reflexive binding.

The binding theory was originally construed as a module of UG determining how pronouns and other nominal expressions are related to each other. While the BT has provided strong support for UG, each condition of the BT appears to behave somewhat differently across languages, thereby showing cross-linguistic variation. Since Chomsky (1981, 1986) proposed the standard BT by unifying the earlier concepts in terms of anaphoric relations,³⁸ this has been an important component of syntax and thus various modifications of BT have proposed to deal with the shortcomings from the perspective of the Government and Binding (GB) theory (Chomsky 1981, 1986) to the current Minimalism (Chomsky 2000, 2001). The traditional view of the binding theory was important in explaining L1 acquisition, because children did not have to learn the binding conditions as they were part of principles of UG. Subsequently, the ‘access to UG’ account was necessary to explain how children acquire the binding principles. Furthermore, the grammatical properties of reflexives have been extensively investigated in order to examine the role of UG in L2 acquisition (e.g. Finer & Broselow 1986; Hirakawa 1990; Finer 1991; Bennett 1994; Eckman 1994; Lakshmanan & Teranishi 1994; Thomas 1989, 1991, 1995; White 1995; Wakabayashi 1996; Bennett & Progovac 1998; MacLaughlin 1998; Yip & Tang 1998; Yuan 1998; Ying 1999; Jiang 2009). However, the traditional BT was required to reformulate upon to the theoretical

³⁸ After the first notion of constraints on binding was introduced in Chomsky (1973), the BT was revised and refined throughout the 1970s and the 1980s.

change since the syntactic evolution from the GB to the MP. This is because the MP is highly derivational, but the canonical BT is regarded as conditions on levels of representations such as D-structure, S-structure and LF (Hornstein 2001; Reuland 2001). In a derivational MP, there is no position for binding conditions that apply on representations, as a modular organisation of UG is dispensed. Subsequently, a number of researchers have reinterpreted the BT whereby binding relations are derived from independent properties of the computational system (e.g. Hornstein 2001, 2006; Reuland 2001, 2005; Heinat 2008; Hicks 2009 among others). Consequently, it is crucial to investigate how the L2 acquisition of reflexive binding can be established by Minimalist views of grammar. Thus this study attempts to provide a new account of the L2 acquisition of reflexive binding, following Hicks (2009), without recourse to a modular organisation of UG. In the next section, I will provide an overview of the classical BT in further depth concerning the conceptual changes in syntactic theory.

4.1 Binding Theory in the GB framework

Binding Theory (Chomsky 1981, 1986) seeks to explain the relationship between pronouns and their antecedents and it has been taken to be one of the sub-theories among UG concerning the distribution of DPs. Based on analyses of English, Chomsky proposed constraints that explain co-reference possibilities between various kinds of DPs. Chomsky (1981) classifies DPs in terms of the two binary features, $[\pm\text{anaphoric}]$ and $[\pm\text{pronominal}]$, and divides DPs into three types. Three types of DPs are subject to different Binding Conditions: anaphors such as ‘himself’ and ‘each other’, pronominals such as ‘he’ and ‘she’, and referring expressions (R-expressions) such as full DPs including names. They are constrained by Chomsky’s Binding Conditions A, B, and C, respectively, as shown in (1):

- (1) The Binding Conditions³⁹
- a. An anaphor is bound in its governing category.
 - b. A pronominal is free in its governing category.
 - c. An R-expression is free.

(Chomsky 1981: 188)

Let us now examine Conditions A and B, and see how they operate within the interpretation of each condition.

- (2)
- a. Mary_i looked at her_{*i}.
 - b. Mary_i looked at herself_i.

In (2a) above, the pronominal ‘her’ cannot refer to ‘Mary’ but refers to another person who is not mentioned in the sentence due to Condition B; thus it is clear that ‘Mary’ and ‘her’ are not interpreted as the same person. The obvious fact in (2b) is that ‘herself’ refers to the same person as ‘Mary’ because of Condition A; that is, the reflexive pronoun ‘herself’ is bound to ‘Mary’. As a result, pronominals do not have antecedents in the same governing category (GC), but anaphors always have antecedents within the

³⁹ A definition of binding is as follows:

- (1) X binds Y if and only if:
 - a. X and Y are coindexed and
 - b. X c-commands Y.

In order for X to bind Y, they must be coindexed and X must c-command Y. The notion of C(onstituent)-command is originally proposed by Reinhart (1976, 1983) and this can be defined as below:

- (2) X c-commands Y if and only if:
 - a. the first branching node that dominates X dominates Y, and
 - b. X does not dominate Y.

Given these requirements, a constituent X binds another constituent Y if X c-commands Y, and X and Y are coindexed. The binding domain in which an anaphor must be bound and pronominal free constitutes a governing category (GC), which is formulated in the following way:

- (3) Governing Category
 - β is a governing category for α if and only if β is the minimal category containing α , a governor of α , and a SUBJECT accessible to α (Chomsky 1981: 211).

The notion of SUBJECT is defined which includes subject and AGR. AGR is the SUBJECT in a finite clause, standard subject (DP of subject) is the SUBJECT of an infinitival clause, and DP of DP (picture-DP) is SUBJECT of a DP. This definition of the binding domain, GC, has been one of the main issues in the binding phenomena.

GC. The following are examples of more complex sentences which illustrate how locality plays a role in determining binding relations:

- (3) a. Mary_i said that Jane_j looked at her_{i/*j/k}.
b. Mary_i said that Jane_j looked at herself_{*i/j/*k}.

In (3b), the anaphor ‘herself’ can refer only to ‘Jane’ who is the subject of the embedded clause, because only ‘Jane’ c-commands the reflexive and is in its GC. Conversely, the reflexive cannot refer to ‘Mary’ who is the subject of the matrix clause as it is outside the GC of the reflexive, nor it cannot refer to someone else (index ‘k’) who is salient in the discourse. Accordingly, we see anaphors have to be bound within specific syntactic domains in terms of Condition A— anaphors must be bound by a c-commanding antecedent in their governing categories. Unlike reflexive pronouns, in (3a), the pronominal ‘her’ cannot be co-referential with ‘Jane’ because it is within the GC of the pronoun. The sentence (3a) can be interpreted in two different ways; the pronominal ‘her’ may be bound to ‘Mary’ who is in the main clause, or may refer to another sentence-external referent. According to Condition B of the BT, the pronominal ‘her’ is free in its governing category. Having looked at the examples from (2) to (3) regarding Conditions A and B, the traditional BT takes anaphors and pronouns to be in complementary distribution within their binding domains. Binding Condition C is related to referring expressions; nouns such as ‘Mary’ are called referring expressions. R-expressions cannot refer to a c-commanding DP. Condition C of the BT will not be examined here.

Although Chomsky’s (1981) binding theory explains distributions of various pronominals, several empirical difficulties arise, in particular, Condition A in English. They include non-complementarity between anaphors and pronouns containing internal binding to picture-DPs (see 4a), DPs within certain adjuncts (see 4b), co-ordinations (see 4c), and some environments of nonlocal binding (see 4d). For instance (these examples are from Reinhart & Reuland 1993 and Büring 2005):

- (4) a. Lucie_i saw a picture of herself_i /her_i.
b. Max_i likes jokes about himself_i /him_i.

- c. Max_i boasted that the queen invited Lucie and himself_i /him_i for a drink.
- d. They_i found that pictures of themselves_i /pictures of them_i were on display.

Chomsky (1986) revised the BT to overcome these problems, particularly to tackle the non-complementary positions.⁴⁰ Chomsky's revision could explain some cases of non-complementarity in English. There have been alternative attempts to revise the BT with respect to the distribution of anaphors and pronouns. Chomsky and other researchers such as Pollard & Sag (1992, 1994) and Reinhart & Reuland (1993) have attempted to deal with some cases concerning nonlocal binding of so-called 'logophors' or 'exempt anaphors' in English.⁴¹ Particularly, Pollard & Sag (1992) and Reinhart & Reuland (1993) have proposed radically different analyses from Chomsky's classical BT in assuming that nonlocal binding is 'exempt' from Condition A of the BT.⁴² For example, Pollard & Sag (1992, 1994) recast the standard BT in terms of the relative obliqueness of the reflexive to its antecedent (within an HPSG framework), arguing that a thematic hierarchy determines binding relations. Pollard & Sag and Reinhart & Reuland's exempt anaphors are governed by pragmatic, semantic or discourse constraints, which are distinct from the purely structural or syntactic constraints of the BT. Among the alternative approaches of BT, the most significant theoretical challenge is the revision of the binding theory under the Minimalist approach, which is the topic of Section 4.5. In the following two sections, I will provide morphological characteristics of Korean reflexives and some examples of cross-linguistic variation of anaphoric binding between English and Korean.

⁴⁰ Chomsky (1986) has restated the definition of the GC and introduced the term 'local domain'. The local domain for binding an anaphor or a pronominal is defined as a minimal governing category, which is a maximal projection containing both a subject and a DP (Chomsky 1986: 169). The BT is, then, unified in the following form:

Condition A: An anaphor is bound in a local domain.
 Condition B: A pronominal is free in a local domain.
 Condition C: An R-expression is free (in the domain of the head of its maximal chain).
 (Chomsky 1986: 166)

⁴¹ Exempt anaphors/logophors do not obey any structural principles in the standard BT.

⁴² Pollard & Sag (1992, 1994) and Reinhart & Reuland (1993) have independently proposed predication-based approaches to Binding Theory, which is that the domain for anaphoric binding is coargument domain. In these approaches, binding can be divided into two types: 'structural binding' and 'exempt binding'. The structural binding is purely syntactic in which the anaphors must be bound by dominating coargument, if there is one. Otherwise, the anaphor is 'exempt' where its reference is determined by non-syntactic, discourse, or pragmatic constraints.

4.2 Morphological characteristics of Korean reflexives

Let us now turn to anaphors in Korean.⁴³ The Korean reflexive *caki* can occupy the subject position of the embedded clause but its English counterpart cannot, as in (5).

- (5) a. Jane_i -un [**caki**_i -ka ttokttokhata]-ko anta. (Korean)
 Jane_i-TOP self_i-NOM smart-COMP know
 ‘Jane knows that she (=Jane) is smart.’
 b. *Jane knows that herself is smart. (English)

The ungrammatical English sentence presented in (5b) is grammatical in its Korean equivalent in (5a). While the reflexive pronoun ‘herself’ is not allowed in finite subject position in English, it is possible in Korean in this sentence. Furthermore, unlike English reflexives which have only one type of reflexive with morphological information about person, gender and number, Korean reflexives have various morphological forms in the following way.

Table 4: Different morphological forms of reflexives in Korean

<i>caki</i>	Monomorphemic, long-distance reflexive, limited 3 rd person antecedents
<i>casin</i>	Monomorphemic, long-distance reflexive, similar to <i>caki</i> , no person-feature restriction
<i>caki-casin</i>	Morphologically compound reflexive of <i>caki</i> and <i>casin</i> , local reflexive, limited to 3 rd person antecedents
pronoun- <i>casin</i> (e.g. <i>ku-casin</i> , <i>kunye-casin</i>)	Morphologically compound reflexive of pronoun and <i>casin</i> , local reflexive

Among these various forms of Korean reflexives, *caki* and *casin* are nonlocal (long-distance) reflexives which obviously differ from English reflexives. The difference between *caki* and *casin* is that the latter permits pronoun-*casin* forms, while *caki* does not. *Caki* is limited to third person singular antecedents as in (6a). As for *casin*, there is

⁴³ The Korean anaphors consist of reciprocals and reflexives. The Korean reciprocal *sero* does not concern us in this study.

no person restriction as shown in (6b) and the form of pronoun-*casin* takes antecedents that are compatible with person features of pronouns. The following examples are based on Gil (2000) and Sohng (2004).

- (6) a. Nay_i /Ney_j /Mary_k -nun **caki**_{*i/*j/k} -lul coahanta.
 I/You/Mary-NOM self-ACC likes.
 ‘I/You/Mary like(s) myself/yourself/herself.’
- b. Nay_i /Ney_j /Mary_k -nun **casin**_{i/j/k} -lul coahanta.
 I/You/Mary-NOM self-ACC likes.
 ‘I/You/Mary like(s) myself/yourself/herself.’

Another distinction between the two forms *caki* and *casin* is that *caki* prefers nonlocal binding generally, whereas *casin* favours local binding (Kang 1998).⁴⁴ We can now summarise that Korean exhibits two types of reflexives morphologically: simplex vs. complex (Yang 1983; Battistella & Xu 1990; Cole, Hermon & Sung 1990; Cole & Sung 1994). The former, typically realised as monomorphemic *caki* or *casin*, allows nonlocal binding, whereas the latter generally takes local binding which makes use of pronoun-*casin* forms such as *caki-casin* and *ku-casin*. The following Table 5 shows a morphological distinction between simplex and complex reflexives.

Table 5: Morphological distinction between simplex and complex reflexives in Korean

Reflexives	Korean	English equivalent
simplex	<i>caki</i>	self
	<i>casin</i>	self
complex	<i>caki-casin</i>	self-self
	<i>ku-casin</i>	himself
	<i>kunye-casin</i>	herself
	<i>kutul-casin</i>	themselves
	<i>nay-casin</i>	myself
	<i>ney-casin</i>	yourself

⁴⁴ These preference rankings are supported by Kang’s (1998, 2001) research. He investigated the occurrences of three reflexives *caki*, *casin*, and *caki-casin* in a ten-million-word Korean corpus.

Anaphors in English do not have this differentiation between simplex and complex. The set of morphologically complex reflexives in Korean consists of a referential pronoun and the monomorphemic *casin*, and this has the same structure as English, pronoun+*self*. They also agree with their antecedents in number, person and gender, thus the complex reflexive *kunye-casin* in sentence (7a) below refers only to ‘Jane’. In contrast, the simplex reflexive can be bound by either the masculine antecedent ‘Peter’ or the feminine antecedent ‘Mary’, as displayed by example (7b).

- (7) a. Mary_i-nun [Jane_j-i **kunye-casin**_{*i/j} -ul ihayhanta]-ko sayngkakhanta.
 Mary_i-TOP Jane_j-NOM herself_{*i/j}-ACC understand-COMP think
 ‘Mary thinks that Jane understands herself.’
- b. Mary_i-nun [Peter_j-ka **caki** (or **casin**)_{i/j} -ul ihayhanta]-ko sayngkakhanta.
 Mary_i-TOP Peter_j-NOM self_{i/j}-ACC understand-COMP think
 ‘Mary thinks that Peter understands himself’ or
 ‘Mary thinks that Peter understands her (=Mary).’

The current study will limit the Korean reflexive as *caki* for the nonlocal reflexive⁴⁵ and *caki-casin* for the local reflexive. I will present the properties of *caki* and *caki-casin* in more detail in Section 4.6.

4.3 Binding differences between English and Korean⁴⁶

This section examines cross-linguistic binding properties regarding locality and orientation in English and Korean. One of the most noticeable differences between Korean and English reflexives is the fact that Korean reflexives take a nonlocal antecedent. The different binding domains have been discussed a great deal in the GB framework in order to explain variation in the distribution of reflexives across languages. Now recall (6a) and (6b) in Section 1.2.2, repeated here as (8a) and (8b). In the following Korean example (8a), the reflexive pronoun *caki* can be bound by a long-

⁴⁵ See Gil (2000: Ch.2) for full details of *caki*-binding.

⁴⁶ The reader should note that a brief overview of the Korean reflexive *caki* has been provided in Section 1.2.2 in order to explain language-specific restrictions on binding.

distance (nonlocal) antecedent ‘Mary’ or by the local antecedent ‘Jane’, whereas in English the reflexive can be bound only by the local antecedent ‘Jane’.

- (8) a. Mary_i -nun Jane_j -i **caki**_{i/j} -lul miwehanta-ko malhayssta. (Korean)
 Mary_i-TOP Jane_j-NOM self_{i/j}-ACC hate-COMP said
 ‘Mary said that Jane hates herself’ or ‘Mary said that Jane hates her’
- b. Mary_i said that Jane_j hates herself_{*i/j} (English)

The interpretation of the reflexive pronoun in (8) is ambiguous in Korean, but not in English. The behaviour of English reflexives concerning locality is explained by Condition A of the BT (i.e. governing category) in the GB framework. However, the Korean anaphor *caki* that allows a nonlocal antecedent cannot be explained by Condition A. In part to address this problem, some modifications dealing with the occurrence of nonlocal reflexives have been provided mostly within the GB period (for a detailed explanation, see Section 4.4). I will observe how the nonlocal reflexive in Korean can be described under the current theoretical change in Section 4.6. As for the anaphors that exhibit nonlocal phenomena such as Korean, Japanese and Chinese, De Vos (2007: 37) has summarised some distinct characteristics (Koster & Reuland 1991; Pica 1987, 1991; Cole & Hermon 2005) as follows.

- (9) a. Antecedents must be subjects;
 b. Nonlocal anaphors allow an antecedent outside the governing category;
 c. Nonlocal anaphor is restricted to reflexives; reciprocals are never nonlocal anaphors;
 d. Nonlocal anaphors are monomorphemic; morphologically complex anaphors are local (Everaert 1991);
 e. In languages without subject verb agreement, nonlocal anaphors exhibit the Blocking effect⁴⁷;

⁴⁷ Binding is blocked between a monomorphemic reflexive (e.g. *ziji* in Chinese) and a matrix subject antecedent when an embedded subject pronoun has a different person feature. Cole, Heron & Huang (2001) point out that the blocking effect is less clear in Korean than in Chinese. Cole, Hermon & Sung (1990 and subsequent papers) assume that this effect is not found in the Korean anaphor *caki*.

- f. Outside the local domain there is no complementarity between pronouns and nonlocal anaphors.

Apart from the locality constraint in binding properties, languages differ in orientation, that is, what can serve as an antecedent for a reflexive; whether its antecedent is required to be a subject or not. The English reflexive can take a subject or non-subject (object) as its antecedent. In contrast, the potential antecedent of the Korean reflexive *caki* is required to be placed in subject position.⁴⁸ The Korean reflexive *caki* can be subject-oriented as in (10a), whereas the English reflexive has no particular orientation restriction and so can be either subject- or non-subject-oriented as in (10b) ((7a) and (7b) in Section 1.2.2 repeated).

- (10) a. John_i -un Peter_j -eykey **caki**_{i/*j} -ey tayhayse malhayssta. (Korean)
 John_i-TOP Peter_j-DAT self_{i/*j} -about told
 ‘John told Peter about himself (=John only).’
 b. John_i told Peter_j about himself_{i/j} (English)

Consequently, the interpretation of English reflexives here is ambiguous, but not in Korean. As for locality, these subject-oriented anaphors do not appear to obey Condition A of the binding theory.

To sum up, the Korean reflexive *caki* exhibits local or nonlocal and subject-oriented binding properties. As we have observed in the differences between Korean and English concerning binding relations, the interaction of locality and orientation constraints displays a cross-linguistic pattern. Additionally, particular interactions of locality and orientation specific to Korean and English have significant consequences:

- (11) a. nonlocally bound reflexives (e.g. the Korean reflexive *caki*) will always be required to be subject-oriented (Huang & Tang 1991; Katada 1991);

⁴⁸ It should be pointed out that *caki*-binding is not strictly subject-oriented; there are some cases where non-subject binding occurs (e.g. Cho 1994; Gil 1998, 2000). I will observe some instances of non-subject binding in Korean in Section 4.6.1.

- b. non-subject oriented reflexives (e.g. the English reflexive *himself* etc.) will always be required to be locally bound.

However, as previously pointed out by Thomas (1995, 1998) and White (2003), these implications only go one way. In other words, even though nonlocal binding involves subject orientation, subject orientation does not always require nonlocal binding (e.g. the subject-oriented Korean reflexive *caki-casin* only allows local binding). Equally, although non-subject orientation involves local binding, local binding does not always entail non-subject orientation. As an empirical generalisation, the binding possibilities for interactions of locality and orientation are represented in the following Table 6.

Table 6: Locality and orientation constraints

Orientation	Binding	
	Local only	Local and non-local
Subject only	e.g. Korean (<i>caki-casin</i>)	e.g. Korean (<i>caki</i>)
Unrestricted	e.g. English (<i>himself</i>)	Not attested

(Domínguez, Hicks & Song 2012: 270)

Not only these three possibilities of binding but also the interactions between locality and orientation constraints thus need to be maintained by the theoretical account. In order to tackle this interaction, various competing theories to the classical BT have been proposed such as the Governing Category Parameter (GCP) (Manzini & Wexler 1987; Wexler & Manzini 1987), the LF-movement approach (Lebeaux 1983; Cole, Hermon & Sung 1990; Pica 1991; Cole & Sung 1994), and the relativized SUBJECT approach (Progovac 1992, 1993). In the following section, I will present these modifications to Condition A of the BT.

4.4 Nonlocal binding in the GB framework

As has been described in Section 4.2, the domain of binding for complex reflexives such as *ku-casin* ('himself') could be explained by the traditional BT in which the

anaphor must be bound in its governing category. However, the standard Binding Theory cannot account for the nonlocal binding of reflexives. In terms of the simple reflexive *caki*, either Condition A is not in question or Condition A should be stated differently. This section provides reviews of some revisions to Condition A of the BT supporting the phenomenon of nonlocal reflexives.

4.4.1 The parameterised binding theory

According to Manzini & Wexler (1987) and Wexler & Manzini (1987), while the binding theory is universal, the domain of binding for reflexives is parameterised across languages. They proposed two parameters, the Governing Category Parameter (GCP) and the Proper Antecedent Parameter (PAP), to account for the differences in languages in regard to the binding pattern of reflexives. The GCP relates to Condition A of the BT, as shown in (12) (note that ‘INFL’ means inflection and ‘TNS’ means tense):

(12) The Governing Category Parameter:

- γ is a governing category for α iff
- γ is the minimal category which contains α and
 - a. has a subject, or
 - b. has an INFL, or
 - c. has a TNS, or
 - d. has an indicative TNS, or
 - e. has a root TNS

(Wexler & Manzini 1987: 53)

According to the GCP, there is a five-value parameter and each language chooses its local domain for reflexives from it. For example, not only the English reflexive (e.g. ‘himself’) but also the reciprocal (e.g. ‘each other’) is determined by value (12a); the Italian reflexive *se* is determined by value (12b); the Russian reflexive *sebjja* is determined by value (12c); the Icelandic reflexive *sig* is determined by value (12d); the Korean reflexive *caki* is determined by value (12e).

In sentence (13a), the English reflexive ‘herself’ can refer only to ‘Sue’, not to ‘Jane’ or not to ‘Mary’; that is, its antecedent must be in the same clause. From the GCP point of view, English reflexives are subject to the setting (12a) of the GCP, and only ‘Sue’ can bind the reflexive ‘herself’. However, from the example of Korean sentence (13b), the reflexive *caki* can refer to ‘Sue’, ‘Jane’, or ‘Mary’ and this is associated with the setting (12e) of the GCP, taking the root sentence as the governing category.

- (13) a. Mary_i believes that Jane_j knows that Sue_k criticises herself_{*i/*j/k}
 b. Mary_i-nun [Jane_j-i [Sue_k-ka **caki**_{i/j/k}-lul piphanhanta-ko] anta-ko] mitnunta.
 Mary_i-TOP Jane_j-NOM Sue_k-NON self_{i/j/k}-ACC criticise-COMP know-COMP believe
 ‘Mary believes that Jane knows that Sue criticises herself.’ or
 ‘Mary believes that Jane knows that Sue criticises her (=Mary or Jane).’

Accordingly, Korean learners have to reset the least restrictive L1 value (12e) of the parameter into the most restrictive value (12a) in their L2 acquisition of English reflexives. A great deal of research has examined whether L2 learners are able to reset the GCP when reflexives in their L1 differ in their settings from reflexives in L2.

The other parameter, the Proper Antecedent Parameter (PAP), has two values with regard to what is allowed as the antecedent of the reflexive in a language; for example, a subject DP or any DP within the governing category. It is defined as shown in (14):

- (14) The Proper Antecedent Parameter
 A proper antecedent for α is
 a. a subject β ; or
 b. an element β whatsoever

(Wexler & Manzini 1987: 64)

As for the PAP, the English reflexive is value (14b) and the Korean reflexive is value (14a), for example:

- (15) a. Tom_i gave Jim_j a picture of himself_{i/j}. (English)

- b. Tom_i -i Jim_j -eykey **caki**_{i/*j} -uy sacin-ul cwuessta. (Korean)
 Tom_i-NOM Jim_j-DAT self_{i/*j}-GEN picture-ACC gave
 ‘Tom gave Jim a picture of himself (=only Tom).’

In (15a), the English anaphor ‘himself’ is bound to either the subject ‘Tom’ or the indirect object DP ‘Jim’. In contrast, the Korean reflexive *caki* in sentence (15b) is only bound by the subject DP ‘Tom’, which is value (14a) of the PAP. Languages, such as Korean, Japanese and Chinese, which allow long-distance binding, require the antecedent to be a subject DP, whereas languages such as English that restrict binding to a local domain allow the antecedent to be any DP. Therefore, Korean and English differ with respect to their values of the GCP and the PAP parameters. Wexler & Manzini (1987) claim that each value of these parameters generates a subset or superset relationship, which is called the Subset Principle.⁴⁹ These can be illustrated as follows:

- (16) a. Subset relations across parameter values of the GCP:
 English \subset Italian \subset Russian \subset Icelandic \subset Korean
 b. Subset relations between parameter values of the PAP:
 Korean \subset English

A number of criticisms of this approach have been made in the literature such as Hermon (1992), Cole & Sung (1994), Thomas (1995) and Atkinson (2001). They have criticised the empirical inadequacy with respect to the typological characteristics of nonlocal reflexives. For example, it is claimed that this model has made incorrect predictions regarding the PAP. This is because the PAP is conceptually correlated with the GCP since nonlocal reflexives are always subject-oriented at LF.⁵⁰ However, Wexler & Manzini (1987) set the GCP and the PAP differently in accordance with the relevant lexical item as an independent parameter. It also fails to account for blocking effects in some languages like Chinese, which block co-reference between a simplex reflexive and a matrix subject antecedent when an intervening clausal subject has a

⁴⁹ The Subset Principle was originally proposed for L1 acquisition. The most intensive discussions of the issues to date can be found in Berwick (1985), Manzini & Wexler (1987), and Wexler & Manzini (1987).

⁵⁰ For the detailed objection, see Thomas (1995) and Atkinson (2001).

different person feature. Furthermore, it is criticised that this approach has only been presented in one-dimensional way. For instance, Korean is generally known to instantiate two types of reflexives, simplex reflexives and complex reflexives. They did not look at some variation among anaphors within the same language which require different parameter settings. In relation to this variation among anaphors, the definition of GC for anaphors does not account for the behaviour of Korean anaphors appropriately. Despite these criticisms, a considerable amount of research on L2 acquisition of reflexive binding has focused on the parametric differences within Wexler & Manzini's (1987) parameterised frameworks (see Section 4.7.2 for a review).

4.4.2 The movement at LF approach

Another analysis for explaining nonlocal binding is an invisible anaphor movement approach (Lebeaux 1983; Battistella 1989; Cole, Hermon & Sung 1990; Pica 1991; Cole & Sung 1994). The LF movement approach claims that differences in binding domains arise from the morphological properties of complex reflexives (e.g. 'himself' in English) versus simplex reflexives (e.g. *caki* in Korean). The most distinguishing claim in this approach is that an X^0 (simplex) reflexive undergoes movement from the S-structure position at the level of LF. Such an analysis argues that the possibility of nonlocal reflexives is due to the property of INFL. The movement to INFL analysis claims that the relation between nonlocal reflexives and their antecedents is local in nature and simplex reflexives move covertly from the argument position successively through head positions to where their potential binder is located.⁵¹ The INFL to INFL movement in Korean is illustrated in the following example (17);

⁵¹ There are different versions of the movement in LF approach concerning the position where the Chinese reflexive *ziji* should move to:

- (1) For Battistella (1989), *ziji* moves from A-position to INFL (INFL-to-INFL movement: see example b);
 - (2) Following Battistella (1989), Cole, Hermon & Sung (1990) argue that *ziji* adjoins to a head position at LF (INFL-to-COMP-to-INFL movement: see example c);
 - (3) For Huang & Tang (1989), *ziji* adjoins to IP, an A'-position (IP adjunction analysis: see example d).
- a. Zangsan_i renwei [Lisi_j zhidao [Wangwu_k xihuan *ziji*_{i/j/k}]]
Zangsan thinks Lisi knows Wangwu likes self
'Zhangsan thinks that Lisi knows that Wangwu likes himself.'
 - b. Zangsan_i *ziji*-INFL renwei [Lisi_j *t*'-INFL zhidao [Wangwu_k *t*'-INFL xihuan *t*]]
 - c. Zhangsan_i *ziji* renwei [*t*' Lisi_j *t*' zhidao [*t*' Wangwu_k *t*' xihuan *t*]]

- (17) a. John_i-i [Mary_j-ka **caki**_{i/j}-lul coahanta]-ko sayngkakhanta.
 John_i-NOM Mary_j-NOM self_{i/j}-ACC like-COMP think
 ‘John_i thinks that Mary_j likes self_{i/j}’

Two possible LF representations of English translation of (17a) are shown as follows:

- b. John [_{VP} thinks [_{CP} that [_{Mary} INFL (**caki**_i) [_{VP} likes **t**_i]]]]
 c. *John* INFL (**caki**_i) [_{VP} thinks [_{CP} that [_{Mary} INFL **t**_i [_{VP} likes **t**_i]]]]]
 (Gil 2000: 48)

Caki in (17b) moves to the INFL of the embedded clause where it can be locally bound only by ‘Mary’, whereas sentence (17c) shows nonlocal binding in which *caki* moves out of the clause to the matrix INFL in a successive cyclic manner. This approach offers a unified account of domain and orientation properties, but the blocking effect (in Chinese) has yet to be resolved. One of the most critical problems is the fact that this theory violates Subjacency Principle in certain constructions since head movement is expected to be barred from crossing island barriers (Progovac 1993).⁵² Furthermore, this approach seems only to deal with East Asian languages such as Korean, Japanese and Chinese, not to be extended to languages such as Russian, Icelandic and Italian in which long-distance antecedents are also allowed. Lastly, the motivation for movement is not maintained from the current Minimalist notions. Movement in the MP is tied to elimination of uninterpretable features. From this perspective, movement must incorporate a last resort operation and this is coupled with economy computations (Hornstein, Nunes & Grohmann 2005).⁵³ In this sense, movement takes place only when it is triggered to avoid ungrammaticality. It seems apparent that the head

d. Zhangsan_irenwei [*ziji* Lisi_j zhidao [*t*’ Wangwu_k xihuan *t*]]

(Cole, Hermon & Sung 1990)

These movement-based approaches of nonlocal binding are conceptually similar to one another, since nonlocal anaphors (e.g. *ziji*) undergo raising at LF.

⁵² Huang & Tang (1989, 1991) note that nonlocal reflexives in Chinese may occur across islands such as adjunct clauses and relative clauses.

⁵³ Last Resort:

A movement operation is licensed only if it allows the elimination of [-interpretable] formal features.
 (Hornstein, Nunes & Grohmann 2005: 293)

movement at LF analysis of nonlocal reflexives in the sense of the MP does not reflect the economical conception of grammatical operations, since the movement is clearly optional. Furthermore, this account derives strict subject orientation which may not be correct for *caki* reflexives (see Section 4.6.1 for further discussion). Despite these limitations, Christie (1992), Christie & Landolf (1998), Yip & Tang (1998), Thomas (1995), and Jiang (2009) have adopted the LF movement approach in their L2 acquisition studies (for a review, see Section 4.7.3).

4.4.3 The relativized SUBJECT approach

Progovac (1992, 1993) proposes the relativized SUBJECT approach by extending X-bar compatibility to binding and this requirement incorporates a revised definition of SUBJECT in the governing category.⁵⁴ Her approach has come to provide accounts for nonlocal binding as well as shortcomings of the movement approach such as subject-orientation and blocking effects. Progovac's proposal is based on the distinction, following Yang (1983) and Pica (1987), that there are both morphologically simplex and complex reflexives in some languages, for example Korean.⁵⁵ The main claim of this approach is relativization of SUBJECT in accordance with the X-bar status of reflexives, thus the contrast between X^0 and XP determines which type of SUBJECT appropriately defines the governing category. This account regards SUBJECT as either subject of a clause ([NP, IP]), subject of an NP ([NP, NP]), or AGR element of INFL. Progovac's principle for nonlocal anaphors comprises the following two parts:

- (18) a. An X^0 reflexive must be bound to Agr, as the only salient (c-commanding) X^0 category.
 b. Agr is the only SUBJECT for X^0 reflexives.

(Progovac 1992: 672)

⁵⁴ The concept of SUBJECT is taken from Chomsky's (1981) work on Binding Theory. The SUBJECT is either the subject of a clause, the subject of a DP, or an AGR element of the clause. This is a cover term that Chomsky used, which is relevant to Binding Theory.

⁵⁵ This approach assumes that X^0 reflexives are feature-defective heads, so it must obtain this by linking to nominal features, AGR of INFL.

That is, a SUBJECT for an X^0 (monomorphemic) reflexive must be a c-commanding X^0 with person and number features such as AGR. In contrast, a SUBJECT for an XP (morphologically complex) reflexive must be a c-commanding XP carrying person and number features such as [NP, NP] and [NP, IP]. For example;

- (19) John_i-un [Bill_j-i [Mary_k-ka [Tom_l-uy **caki**_{i/j/k/l} etayhan thayto]-lul silhehan-ta-ko] sayngkakan-ta-ko] mit-nun-ta.

‘John_i believes that Bill_j thinks that Mary_k hates Tom_l’s attitude toward **self**_{i/j/k/l}’

(Progovac 1993: 755)

The Korean reflexive *caki* here is bound across two instances of [NP, IP] and one instance of [NP, NP]. Her point is that these DPs cannot count as SUBJECTs in Korean, but only the AGR can (under the assumption that the root clause has AGR but the embedded clause does not). While ‘Tom’ seems to count a SUBJECT in English, it does not seem to count as a SUBJECT in Korean. Furthermore, Progovac predicts nonlocal antecedents for X^0 languages that lack morphological AGR. According to Progovac, a reflexive and its binder should have the same X-bar status. An X head (X^0) reflexive such as *caki* in Korean must be bound in the domain of a SUBJECT which is also a head (AGR), whereas an XP reflexive such as ‘himself’/‘herself’ in English must be bound within the domain of a SUBJECT which is also an XP (the clausal subject or subject of a complex NP). This was the main advantage of Progovac’s approach that was capable of accounting for two types of Korean reflexives.

The status AGR plays a significant role in establishing binding domains. Huang (1982) and Borer (1989) claim that AGR in Chinese is syntactically present, but morphologically null; so this is anaphoric. However, AGR in English carries morphological features thus it is referential. This anaphoric/referential variation in terms of AGR may be reduced to a binary parameter: [+AGR] (referential) and [–AGR] (anaphoric). In [–AGR] languages like Korean, referential AGR is absent in finite clauses as well as infinitival clauses. Therefore, nonlocal binding occurs in Korean with X^0 anaphors when anaphoric AGR is present. This approach may lead to the AGR parameter and the different morphological properties of reflexives. Progovac (1993)

claims that these two factors operate together to determine the binding domains possible in a language.

Progovac's analysis may offer an adequate account for the cluster of properties associated with X^0 reflexives (e.g. nonlocal reflexives with subject orientation) and blocking effects which have arisen in the LF movement analysis. However, the relativized SUBJECT analysis leaves some empirical questions unanswered. For instance, this analysis does not provide an explanation for certain binding properties such as non-subject orientation with nonlocal binding. Additionally, one of the modules of UG, X-bar theory is eliminated from the current Minimalist account. Since Progovac's analysis is motivated by incorporating X-bar theory itself into the binding theory, the modification for nonlocal binding has failed to bring the binding theory into the Minimalist assumptions. For L2 acquisition of anaphoric binding, Bennett (1994), Bennett & Progovac (1998), and MacLaughlin (1998) have used this account in their studies (for a review, see Section 4.7.4).

4.4.4 The non-syntactic approaches

There have been attempts to distinguish syntactically bound reflexives from semantically or pragmatically bound reflexives. According to Huang & Liu (2000), some cases of reflexive binding are an instance of syntactic anaphors and others are logophors. The former involves an anaphor whose reference is governed by Condition A of the BT, while the latter is restricted by discourse or pragmatic conditions. Therefore, it has become clear that the logophoricity analysis examines nonlocal binding by looking at function of the discourse, rather than looking at the formal syntactic status. For example, Sells (1987) argues that logophoricity refers to the subject of consciousness (the one who makes the report: SELF), the source of reported speech (the one whose mind is being reported: SOURCE), or deictic perspective (the one from whose point of view the report is made: PIVOT). Following Sells's notion of PIVOT, the logophoric use of an anaphor is determined by certain predicates which can control the selection of the antecedent. Particularly, Cho (1994) differentiates subject-centered predicates from non-subject-centered predicates in Korean *caki* binding, exceptional cases which have been opposed to the generalisation of subject-oriented *caki* (I will

observe the data for non-subject binding of *caki* in Section 4.6.1). Pollard & Xue (2001) discuss various semantic and discourse binding in Chinese; for instance, intensification, contrastiveness, logophoricity, and discourse prominence are argued to be general factors affecting the distribution of non-syntactic antecedents of reflexives. A thematic hierarchy has also been taken into consideration in long-distance binding, resulting in various versions of thematic hierarchies (e.g. Jackendoff 1972; Grimshaw 1990; Kiss 1991). I will not discuss these semantic or discourse constraints of long-distance binding any further as the present study will attempt to focus on syntactic constraints. In the field of L2 acquisition research, some studies have examined pragmatic versus syntactic influences on reflexive interpretations (e.g. Thomas 1989; Yuan 1998; Demirci 2001; Kim, Montrul & Yoon 2005). These studies have investigated how pragmatic constraints affect the L2 acquisition of English reflexives.

4.4.5 Section summary

Since nonlocal binding cannot be applied to the standard Binding Theory, revised or reanalysed approaches have attempted to cope with the phenomenon of nonlocal reflexives. Those modifications have been considered syntactically in accordance with c-command conditions or requirements on head movement. All these modifications to binding in the GB theory seem to be unable to provide a unified account for the nonlocal nature that holds cross-linguistic phenomena. As a consequence, various semantic, pragmatic, or discourse accounts have been used to explain nonlocal reflexives. As pointed out by Gil (2000), the phenomenon of LD binding (particularly in Korean) involves more complex constraints that arise from a combination of syntactic, semantic, and pragmatic relationships. Amongst the alternative accounts of the binding theory, the most successful modification is a Minimalist feature-based approach to binding. The next section will demonstrate a feature-based account of locality and orientation constraints in English, particularly as proposed by Hicks (2009).

4.5 Binding in Minimalism

In the earlier Minimalist Program (MP), the classical BT was reformulated as interpretative principles at LF.⁵⁶ Under the Minimalist assumption (Chomsky 1993, 1995), the binding conditions hold only at the LF interface since the MP eliminates D-structure and S-structure.⁵⁷ I will look at the binding relations based on the recent version of the Agree-based Minimalist framework (Chomsky 2000, 2001). Reuland (2001, 2005), Heinat (2008), and Hicks (2009) argue that constraints on reflexive binding concerning locality and orientation can be interpreted as a grammatical operation of feature checking. According to Hicks (2009), the relevant features of anaphoric binding in English are ‘semanticsyntactic’ features which give rise to operator and variable semantics, so-called [VAR(IABLE)].⁵⁸ It is assumed that these features are manipulated in the computational system (i.e. narrow syntax) but they are also semantically interpretable, translating into logical variables at LF. Hicks’s (2009: Ch.4) suppositions for the binding relations are as follows:

- (20) a. Referential DPs including pronouns and anaphors bear a variable feature [VAR], which is unvalued on anaphors and valued on R-expressions and pronouns.
- b. Anaphor binding can be established by the Agree operations in narrow syntax, thereby valuing an anaphors’ unvalued feature [VAR:_] by a valued feature [VAR] on the antecedent.

⁵⁶ Since the Minimalist account adopts an elimination of indices, Chomsky (1993, 1995) reformulates binding conditions as interpretive procedures, which are first suggested by Chomsky & Lasnik (1993) as follows:

Interpretive version of Binding Theory

- a. If α is an anaphor, interpret it as coreferential with a c-commanding phrase in D (D=the relevant local domain).
- b. If α is a pronominal, interpret it as disjoint from every c-commanding phrase in D.
- c. If α is an r-expression, interpret it as disjoint from every c-commanding phrase.

(Chomsky 1995: 211)

⁵⁷ In the Minimalist theory, only LF and PF conditions are assumed to be interface conditions. For the further discussion pertaining to binding in the early MP, see Hicks (2009: Ch.2).

⁵⁸ This study follows Hicks’s logical representations of operators and variables as semanticsyntactic features, [OP] and [VAR] respectively; the values for [OP] may be \forall and \square , and the values for [VAR] may be identified by x , y , or z .

- c. An anaphor must be bound in its phase in the phase-based approach of Chomsky (2001) (e.g. ν P and CP).

Let us now look at how the binding process of valuation in the LF representation can be established through the feature-based Agree operation. According to Hicks, an anaphor bears an unvalued feature [VAR: $_$], which is interpreted semantically at LF as a variable, as illustrated in (21b). The Agree relation copies the value of the antecedent's [VAR] feature onto the reflexive, as in (21c), which must be valued within the phase ν P due to the Phase Impenetrability Condition.⁵⁹ Thus, the valuation is achieved through valued [VAR] feature of the antecedent, which eventually yields an LF representation like (21d).

- (21) a. Every boy loves himself.
 b. Every_{[OP: \forall], [VAR: x]} boy loves himself_[VAR: $_$]
 c. Every_{[OP: \forall], [VAR: x]} boy loves himself_[VAR: x]
 d. $\forall x. \text{boy}(x) \rightarrow \text{love}(x, x)$

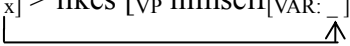
(Hicks 2009: 117)

It should be emphasised that the relevant binding domain for reflexives under the phase-based approach of the Minimalism is the minimal phase containing the reflexive (e.g. ν P). This assumption that ν P is a binding domain for reflexives clearly accounts for the locality condition on the anaphoric binding in Hicks's study (see Hicks 2009: Ch.4) (remember that the GC is a binding domain in the GB framework). Additionally, the assumption that a reflexive must be bound in its phase can straightforwardly explain orientation in which the feature can be checked either by a subject or non-subject argument. Adopting Hicks's proposal (2009: 129-130), let us derive binding relations in English concerning locality and orientation.

⁵⁹ In the phase-based account of the Minimalism (Chomsky 2000, 2001), Chomsky identifies ν P and CP as phases. Chomsky (2000: 108) formalises the Phase Impenetrability Condition as follows:

Phase Impenetrability Condition (PIC):

In phase α with head H, the domain of H is not accessible to operations outside α , only H and its edge [its specifier(s)] are accessible to such operations.

- (22) a. John likes himself.
 b. $[_{TP} \text{John}_{[VAR: x]} [_{vP} <\text{John}_{[VAR: x]} > \text{likes } [_{VP} \text{himself}_{[VAR: _]}]]]$
- 

In sentence (22b), the unvalued [VAR:_] semanticosyntactic feature of the anaphor ‘himself’ should be valued by the c-commanding DP ‘John’ which enters the derivation within the minimal phase vP . When the DP ‘John’ enters the derivation in the c-commanding position [Spec vP], its valued [VAR] feature can value the unvalued [VAR:_] feature on the anaphor across the vP phase. Therefore, ‘John’ binds ‘himself’.

- (23) a. John said that Paul likes himself.
 b. $[_{TP} \text{John}_i [_{vP} <\text{John}_i> \text{said } [_{CP} \text{that Paul}_j [_{vP} <\text{Paul}_j> \text{likes himself}_{*i/j}]]]]]$

In the derivation of the above sentence (23b), ‘himself’ requires a c-commanding DP to enter the derivation bearing a matching feature within its minimal vP phase. As the subject DP ‘Paul’ enters the derivation in the c-commanding position [Spec vP], its valued [VAR] feature values the unvalued [VAR:_] on the anaphor ‘himself’ via the Agree operation before the completion of the vP phase. Thus an antecedent ‘Paul’ locally binds an anaphor ‘himself’. However, ‘John’ does not bind ‘himself’ because ‘John’ has not entered the derivation within the same vP phase, so its valued [VAR] feature cannot value the anaphor’s unvalued feature [VAR:_].

Now let us observe a sentence concerning orientation. Since the locality constraint should be established before the completion of the minimal phase, there is no requirement regarding orientation. The unvalued [VAR:_] feature of the reflexive can be valued either by a subject DP or a non-subject DP.

- (24) a. John told Paul about himself.
 b. $[_{TP} \text{John}_i [_{vP} <\text{John}_i> \text{told } [_{VP} \text{Paul}_j <\text{told}> [_{PP} \text{about himself}_{i/j}]]]]]$

In the example (24b), the subject antecedent ‘John’ or the object antecedent ‘Paul’ enters the derivation within the vP phase, hence each valued [VAR] feature of the DP (‘John’ or ‘Paul’) values the unvalued [VAR:_] feature of the anaphor ‘himself’. Therefore, the expectation is that a subject or a non-subject binding is possible.

This section has observed how locality and (absence of) orientation for English reflexives can be derived under the current Minimalist framework where syntactic derivations proceed through phases. The local nature of anaphoric elements in English is derived via the Agree operation between reflexive and antecedent, so-called ‘anaphoric (or referential) dependency’ approach. No restriction on subject-orientation is a consequence of the Agree operation. If the syntactic derivations force local binding due to Agree, the possibility of subject and non-subject binding follows automatically. However, it does not mean that local binding due to other mechanisms implies the possibility of non-subject orientation (see Table 6).

The important change in binding conditions from Condition A of the classical BT to the Minimalist feature-based account allows binding relations to be understood as a valuation of the unvalued feature at LF upon completion of ν P phase. Hicks’s (2009) major arguments on binding thus lead to the complete rejection of the classical BT as part of Universal Grammar. If the binding theory is not universal, it would be interesting to explore to what extent the new account can explain cross-linguistic binding phenomena. The following section presents available analyses of Korean reflexives within the current theoretical framework assumed here.

4.6 Defining the featural composition of Korean reflexives

The literature on the paradigm of Korean reflexives is an extensive topic with contradictory approaches involving a range of syntactic and non-syntactic treatments. Korean reflexives are generally split into two types: local vs. nonlocal. While two kinds of simplex reflexives *caki* and *casin* show a similar syntactic behaviour in that they can have nonlocal antecedents⁶⁰, two kinds of complex reflexives *caki-casin* and pronoun-*casin* (such as *ku-casin*) are exclusively local anaphors. For the purposes of the current study, this section clarifies the nature of nonlocal anaphor *caki* and the local anaphor *caki-casin* respectively. Then I will define how nonlocal *caki* and local *caki-casin* can

⁶⁰ Although *caki* can exchange with *casin* freely in the contexts, they show slightly different acceptability regarding locality. Nonlocal reading is preferred for *caki*, but local reading is preferred for *casin* (Park 1988; Kang 1998, 2001).

be shaped within the current theoretical framework of the feature-based account, as this study has observed English binding relations which have arisen by feature valuation.

4.6.1 Korean nonlocally bound reflexive *caki*

I first outline the nonlocal reflexive, *caki*.⁶¹ Since the Korean nonlocal reflexive *caki* does not follow a syntactic constraint such as c-command conditions along the lines of Condition A, there are a series of claims that *caki* should be seen as a pronominal. Sohng (2004) and Han & Storoshenko (2009) have summarised salient characteristics for treating *caki* as a pronoun: long-distance antecedents, split-antecedents, and sentence-external (or discourse) antecedents. The treatment of *caki* as a pronoun first comes from the fact that it can have a non c-commanding antecedent outside the local domain. The second observation of *caki* as a pronoun comes from plural forms of the reflexive *caki-tul* (Jeon 1989; Yoon 1989; Jayaseelan 1997; Huang 2000; Sohng 2004). Let us consider the following example.

- (25) Pierre_i-ka Marie_j-eykey **caki-tul**_{i+j}-uy sacin-ul poyecwu-ess-ta.
 Pierre-NOM Marie-DAT self-PL-GEN photo-ACC show-PAST-DECL
 ‘Pierre showed Marie a photograph of themselves.’
 (Jeon 1989: 114, cited in Jayaseelan 1997)

Caki is pluralised using the *tul* morpheme and can receive a plural reading. In (25), however, there is no plural antecedent; *caki-tul* refers to both ‘Pierre’ which is the matrix subject and ‘Marie’ which is the matrix object, taking two separate DPs as so-called ‘split’ antecedents. The last treatment of *caki* as a pronoun-like behaviour is that it may take sentence-external antecedents in the discourse, which are unbound within the sentence. Sohng (2004) further points out that there are some cases for *caki* which have arbitrary reference (first or second person), as shown in (26).

⁶¹ There is another nonlocal Korean reflexive, *casin*. The syntactic status of *casin* is less studied in the literature than that of *caki* because *casin* is exclusively used as an emphatic function, it is used with pronoun such as *ku/kunye-casin*, or it is used with proper nouns for an emphatic purpose such as *Mary-casin*. According to Jayaseelan (1997), the form of *casin* is in fact *pro-casin* where *pro* gets its reference from contexts with an emphatic meaning.

- (26) John_i-un [**caki**_{arb/i}-ka **caki**_{arb/i}-uy calmoss-ul kochi-eya-ha-n-ta]-ko
 John-TOP self-NOM self-GEN faults-ACC correct-should-PRES-DECL-COMP
 sayngkakha-n-ta.
 think-PRES-DECL
 ‘John thinks that one/he should correct one’s/his faults.’
 (Sohng 2004: 380)

Since only the third person DP is considered to be the antecedent of *caki*, first and second person antecedents are not allowed. However, *caki* in (26) is ambiguous between ‘John’ and arbitrary reference. *Caki* can also be interpreted as first or second person showing inherent reference, provided that there is no possible antecedent, as the following example illustrates.

- (27) **Caki**-ka chakha-ta.
 self-NOM be good-DECL
 ‘You are good.’
 (Sohng 2004: 381)

The empirical facts outlined have led several authors (e.g. Fukui 1984; Ueda 1984; Cole, Hermon & Sung 1990) to argue that *caki* should be treated as an obligatorily bound pronominal. For instance, Cole, Hermon & Sung (1990) argue that *caki* is essentially a pronominal element but not an anaphor since *caki* does not exhibit a blocking effect, unlike Chinese *ziji*.⁶² Although such examples are used to claim that *caki* is a pronominal, Gil (1998, 2000) strongly argues that *caki* should not be regarded as a pronoun only because it is bound by an antecedent outside the local domain. Furthermore, Han & Storoshenko (2009) claim that although *caki* demonstrates

⁶² Yet they have provided evidence of the blocking effect with *casin* rather than *caki* (Cole, Hermon & Sung 1990):

- a. Chelswu_i-nun [Inho_j-ka casin_i-ul sarangha-n-ta]-ko sayngkakha-n-ta.
 Chelswu-TOP Inho-NOM self-ACC love-PRES-DECL-COMP think-PRES-DECL
 ‘Chelswu thinks Inho likes himself.’
 b. *Chelswu_i-nun [nay_j-ka casin_i-ul sarangha-n-ta]-ko sayngkakha-n-ta.
 Chelswu-TOP I-NOM self-ACC love-PRES-DECL-COMP think-PRES-DECL
 ‘Chelswu thinks I love himself.’

pronoun-like characteristics as presented above, *caki* is a bound anaphor but not a pronominal. I will briefly observe their analyses of a bound variable *caki* in the end of this section.

Further the puzzling behaviour of *caki*-binding is the fact that *caki* is not strictly subject-oriented (Yoon 1989; Moon 1992; Cho 1994; Moon 1995; Gil 2000; Sohng 2004). Parallel to Moon (1995), Sohng (2004) claims that *caki* shows weak subject-orientation in the sense that subject antecedents are preferred over object antecedents, but objects are also possible antecedents.⁶³ This view dates back to Park (1986), Lee (1988), and Yoon (1989). Yoon (1989) argues for logophoric properties of *caki* as shown in (28b), comparing with subject-only binding in (28a). For Yoon (1989), non-subject ‘Mary’ is a possible antecedent for *caki* in (28b) but the subject antecedent ‘John’ is a more favoured interpretation than the non-subject antecedent ‘Mary’.

- (28) a. John_i -i Mary_j -eykey [**caki**_{i/*j} -ka am-i-la-ko] malha-yess-ta.
 John-NOM Mary-DAT self-NOM cancer-be-DECL-COMP tell-PAST-DECL
 ‘John told Mary that he has cancer.’
- b. John_i -i Mary_j -lopwute [**caki**_{i/j} -ka am-i-la-ko] tul-ess-ta.
 John-NOM Mary-from self-NOM cancer-be-DECL-COMP hear-PAST-DECL
 ‘John heard from Mary that he (or she) has cancer.’
- (Yoon 1989: 481)

Cho (1994) also provides a logophoric analysis of *caki* in that non-subject binding occurs when a matrix verb is ‘object-centred predicate’ (Cho’s term). She claims that non-subject binding for nonlocal anaphors in Korean depends on the predicate effects with speakers’ (subject or object) viewpoint. For example, certain verbs such as *mwutta* ‘ask’ and *tutta* ‘hear’ are strongly pragmatically biased towards non-subject binding, as in (29).

⁶³ Similarly, O’Grady (1987) also proposes a hierarchy for potential antecedents of *caki*, which indicates that *caki* takes the highest eligible NP as its antecedent (e.g. subject > object (direct or indirect) > other NP’s). Kim (2000) further defines a principle of the prominence hierarchy based on grammatical functions, which is stated that *caki* is coreferential with the most prominent antecedent (e.g. topic > subject > object of verb > object of preposition > genitive NP > object of comparative).

- (29) a. John_i -i Bill_j -eykey **caki**_{i/j} -uy elinsicel etayhayse mwul-ess-ta.
 John-NOM Bill-DAT self-GEN childhood about ask-PAST-DECL
 ‘John asked Bill about his (=Bill) childhood.’
- b. John_i -i Bill_j -eykey **caki**_{i/j} -uy elinsicel etayhayse tul-ess-ta.
 John-NOM Bill-DAT self-GEN childhood about hear-PAST-DECL
 ‘John heard from Bill about his (=Bill) childhood.’
- (Cho 1994: 167)

The additional evidence of non-subject binding is from the contexts of causative predicates. As noted by Cho (1994) and Gil (2000), the causative predicates can derive subject as well as non-subject antecedents. In (30a) and (30b), *caki* can be bound either by the subject or the object antecedent.

- (30) a. John_i -i Bill_j -eykey **caki**_{i/j} -uy pap-ul mek-i-ess-ta.
 John-NOM Bill-DAT self-GEN meal-ACC eat-CAUS-PAST-DECL
 ‘John feed Bill his (=John or Bill) meal.’
- (Cho 1994: 169)
- b. John_i -i Mary_j -lul **caki**_{i/j} -uy chayk-ul ilk-hi-essta.
 John-NOM Mary-ACC self-GEN book-ACC read-make-PAST
 ‘John made Mary read his book.’ or ‘John made Mary read her book.’
- (Gil 2000: 40)

So far, the property of *caki* has raised the issue of the behaviour of pronominal, since it does not follow the requirement for a c-command relation. Moreover, the empirical generalisation of subject orientation for *caki* is called into question due to the explicit counter examples. In order to provide a substantive account for both subject and non-subject binding cases of *caki*, Gil (2000) proposes an HPSG account of *caki* based on the lexical argument hierarchy, which is not pursued in this study. Yet considering Gil’s (1998, 2000) topic-binding analysis for the Korean anaphor *caki* becomes an important component in the current study. Gil (1998) claims that the topic-binding approach may capture a range of instances of discourse-bound *caki* since an empty topic operator can serve as an antecedent. This is illustrated in the following example.

- (31) a. Mary_i-ka ku pati-e kass-ni anim tarun salam-i taysin kass-ni?
 Mary-NOM the party-to went-Q or other person-NOM instead go-Q
 ‘Is it Mary who went to the party or somebody else instead?’
- b. Ani, [e_i]_{TOP} **caki_i**-ka kasse.
 No, self-NOM sent
 ‘No, she went.’

(Gil 1998: 7)

In (31), *caki* is bound by the prominent topic ‘Mary’ in the previous discourse as the null topic operator occupies [Spec CP]. This author points out that the discourse-based topic-binding *caki* is syntactically bound by a null topic operator rather than any individual in the discourse level. Following Gil’s (1998) analysis of topic-oriented rather than subject-oriented *caki*, Han & Storoshenko (2009) argue that *caki* is a bound variable whose antecedent occupies an A’ position via Quantifier Raising (QR), similar to topicalisation. This is shown in (32).

- (32) a. Motwu_i-ka **caki_i**-lul salang-ha-n-ta.
 everyone-NOM self-ACC love-do-PRES-DECL
 ‘Everyone loves himself (or herself).’
- b. Every λx [x loves x]

(Han & Storoshenko 2009)

In (32a), *caki* is bound by the quantifier DP *motwu* ‘everyone’ since the binder for *caki* undergoes QR into a position which c-commands *caki* at LF. (32b) shows a semantic representation of local binding of *caki* which is interpreted as a bound variable reading. This bound variable analysis can equally explain local binding as well as nonlocal binding, as in (33).

- (33) a. Motwu_i-ka [John_j-i **caki_i**-lul salang-ha-n-ta-ko] sayngkak-ha-n-ta.
 everyone-NOM John-NOM self-ACC love-do-PRES-COMP think-do-PRES-DECL
 ‘Everyone thinks John loves him.’

(Moon 1995, cited in Han & Storoshenko 2009)

b. Everyone $\lambda x[x \text{ thinks } [\text{John loves } x]]$

(Han & Storoshenko 2009)

In (33a), *caki* can have a bound variable reading as a quantifier DP *motwu* binds *caki*. In the spirit of Gil (1998, 2000), Han & Storoshenko (2009) have shown the bound variable analysis of nonlocal anaphor *caki* at the level of LF, as described above. This analysis accounts for local reflexivisation which is instantiated by a covert topic operator, and thus its antecedent does not need to c-command it in overt syntax. This analysis also accounts for the nature of nonlocal reflexivisation, since quantifier binding is not subject to syntactic locality constraints but is a condition on semantic scope relations. I follow the analyses of Gil (1998, 2000) and Han & Storoshenko (2009) in *caki*-binding, assuming that local and nonlocal reflexive *caki* is a variable bound by a topic.

Clearly, nonlocal reflexive phenomena in Korean cannot be understood by the same kind of analysis exhibited by English reflexives. If we apply the mechanism of anaphoric dependency driven by feature valuation for Korean nonlocal reflexives as in (34b) below, then a problem immediately arises since the nonlocal antecedent is outside the minimal phase νP , which is consistent with local binding domains.

- (34) a. Mary_i-nun Jane_j-i **caki**_{i/j} -lul miwehanta-ko malhayssta.
 Mary_i-TOP Jane_j-NOM self_{i/j}-ACC hate-COMP said
 ‘Mary said that Jane hates herself’ or ‘Mary said that Jane hates her’
- b. ?[_{TP} Mary_i -nun [_{νP} <Mary_i -nun> [_{CP} Jane_j -i [_{νP} <Jane_j -i> **caki**_{i/j} -lul
 miwehanta]-ko] malhayssta]]

According to Hicks (2009), languages may employ different semantic or syntactic mechanisms to explain binding possibilities. Nonlocal anaphor binding in Korean may use particular semantic aspects of the interpretation such as the bound variable mechanism to binding by a topic as no syntactic operation is involved in the derivations. Thus the semantic aspects of long-distance binding differ from the kind exhibited by English reflexives. Domínguez, Hicks & Song (2012) propose that since *caki* involves a different kind of mechanism of construal (as there is no unvalued [VAR] feature that

requires syntactic valuation), it could be considered to be a value that relates to its requirement to be topic-bound, e.g. [VAR: Topic]. Therefore, this study is now readily able to capture the behaviour of Korean reflexives without postulating an additional mechanism in order for nonlocal phenomenon of *caki*. As a consequence, the current work makes use of a slightly different feature specification of reflexive. (35) below demonstrates a summary of *caki*.

(35) The properties of *caki*:

- a. Semantic bound variable mechanism to binding by a topic, similar to QR;
- b. *Caki*-binding derives subject orientation which seems be a default setting in general (Han, Storoshenko & Walshe 2010), but non-subject orientation is also observed;
- c. Local or nonlocal antecedent is possible, but variable binding or quantifier binding at LF is constrained by scope/c-command, and not locality. In consequence, *caki* shares some pronominal-like properties rather than anaphors.

4.6.2 Korean locally bound reflexive *caki-casin*

Contrary to the account of nonlocal anaphor *caki*, *caki-casin* is a local reflexive, like other forms of the *pronoun-casin*, as in (36). This study does not concern the morphological structures of *pronoun-casin* since their syntactic status appears to be somewhat less clear than *caki-casin* (see footnote 61).⁶⁴

- (36) John_i-un Bill_j-i **caki-casin** (or **ku-casin**)*_{i/j}-ul miwehanta-ko sayngkakhanta.
 John_i-TOP Bill_j-NOM self-self*_{i/j}-ACC hate-COMP think
 ‘John thinks that Bill hates himself’

⁶⁴ Lee (2001) notes that even though the properties of *pronoun-casin* and *caki-casin* have largely shown an identical structural status as a local anaphor, native speakers of Korean consulted preferred *caki-casin* to *ku-casin*, as a natural local anaphor, in the judgement of English sentences containing *himself*. This is derived from his observation that the *pronoun-casin* forms were introduced into the language in the late 1930s by some novelists under the influence by Western literature.

However, the distributions of *caki-casin* do not appear to be strictly local.⁶⁵ Consider the following examples.

- (37) a. John_i -i [caki-casin_i /ku-casin_i -i ttokttokhata]-ko sayngkakha-n-ta.
 John-NOM self-NOM smart-COMP think-PRES-DECL
 ‘John thinks that he is smart.’
- b. John_i -un [Mary_j-ka [caki-casin*_{i/j} -i ttokttokha-ta]-ko saynkakha-n-ta]-ko
 John-TOP Mary-NOM self-NOM smart-DECL-COMP think-PRES-DECL-COMP
 malha-yess-ta.
 tell-PAST-DECL
 ‘John told that Mary thinks that she is smart.’

(Yoon 1989: 480)

Caki-casin can refer to an antecedent from a higher clause, as in (37a). The important restriction is that *caki-casin* must take the closest antecedent, whether its antecedent is located within the local domain or not. Thus, in (37b), *caki-casin* refers to the nearest antecedent ‘Mary’, but not to ‘John’. According to Yoon (1989), such behaviour of *caki-casin* is not in fact the long-distance phenomenon of *caki-casin*, but this reflects the effect of a strict clausal local binding. Yet the nonlocal use of *caki-casin* can be found in the following example.

- (38) Mary_i -nun Tom_j -i cakicasin_i -ul coahantako sayngkakhanta.
 Mary-TOP Tom-NOM selfself-ACC like think
 ‘Mary thinks that Tom likes her.’

(Lee 2008: 94)

Lee (2008) claims that *caki-casin* can refer to the nonlocal antecedent ‘Mary’ if it can be emphatically used. Lee points out that, for the emphatic use of *caki-cain*, an extra stress is placed on to the second morpheme *casin* and a pause is put after the first

⁶⁵ Lee (2001) claims that the *pronoun-casin* forms either in object positions of embedded clauses or in subject positions of mono-clausal sentences can take a nonlocal antecedent when they are used as an emphatic reading. In these cases, it is argued that the paradigm of *pronoun-casin* such as *ku-casin* and *kunye-casin* should be interpreted as an emphatic anaphor combined with a pronoun, i.e. ‘he/him himself’ and ‘she/her herself’ respectively.

morpheme *caki* (or pronoun *ku* in *ku-casin*). Hence it is claimed that the emphatic function of the nonlocal reading of *caki-casin* is treated as a pronominal in line with Jayaseelan (1997). Importantly, *caki-casin* exhibits a strict subject orientation, unlike *caki* which is only shown to exhibit a weak subject-orientation.

Tsoulas (2004) provides an analysis of the locally bound reflexive *caki-casin* which derives reflexive interpretation by undergoing a process of cliticisation at LF to a c-commanding predicative head (such as *v*), unlike the nonlocal reflexive *caki*. The LF movement of *caki-casin* is instantiated through the assignment of a specific value associated with a particular feature. He identifies the feature attribute as ‘Index’, and the relevant feature value as ‘Cliticisation_{LF}’, for instance, [INDEX: Cliticisation_{LF}]. Consistent with this view, Domínguez, Hicks & Song (2012) argue that the interpretation of *caki-casin* can be derived through the relationship with predicate-based reflexivisation. According to Hicks (2009: 224):

[I]anguages could in principle generate reflexive interpretations either by a reflexive serving to specify a predicate with the property of being semantically reflexive, as in this case,⁶⁶ or by a reflexive directly receiving its interpretation from a syntactic antecedent (e.g. by Agree, as for the English reflexives).

In the literature, there has been a long tradition in dealing with reflexive as a predicate reflexiviser. For example, Reinhart & Reuland (1991, 1993) have attempted to elucidate anaphoric relations in terms of reflexive predicates.⁶⁷ Their binding conditions are based on predicates and concern how reflexivity (which is restricted to co-arguments) is marked on predicates.⁶⁸ Since reflexivity is understood as two co-referential arguments,

⁶⁶ Hicks makes the argument for Dutch, Icelandic and Norwegian simplex reflexives, but the approach may extend naturally to Korean. This difference between ‘anaphoric dependence’ and ‘reflexivity’ is supported by data from Dutch, for example, where the choice of the particular reflexive (complex versus simplex) subtly affects interpretive possibilities in certain contexts due to the nature of the ‘reflexivity’, e.g. “Munchhausen” and “Mme Tussaud’s” contexts (attributed to Voskuil & Wehrmann 1990a, b; Jackendoff 1992; Lidz 2001).

⁶⁷ They assume that, following Chomsky (1986) and Keenan (1987), anaphors are referentially defective and binding is viewed as a process assigning the content necessary for their referential interpretation.

⁶⁸ Reinhart & Reuland (1993: 678) introduce the concept of the reflexive-marking and propose Conditions A and B below:

Condition A: A reflexive-marked syntactic predicate is reflexive.

the complex anaphor *caki-casin* could provide a necessary reflexive marking as this anaphor is generally considered to be local. That is, the reflexive *caki-casin* is considered to take the semantic function of reflexivising a local predicate. This relationship can be schematised as follows:

$$(39) \quad x \text{ washed } \underset{\swarrow}{\text{caki-casin}} \quad \rightarrow \lambda x.\text{wash}(x,x)$$

(Domínguez, Hicks & Song 2012: 275)

If Tsoulas's [INDEX] feature is replaced by Hicks's [VAR] feature for *caki-casin*, then it can be assumed that the feature bears the Cliticisation_{LF} value like [VAR: Cliticisation_{LF}] and the reflexive *caki-casin* is interpreted as a predicate reflexiviser such as [VAR: Reflexive]. Importantly, reflexivisation of a predicate obligatorily results in strict subject-orientation since only the subject of the predicate head is an available antecedent for the reflexive. For an object reflexive which reflexivises a predicate head *v*, the only possible interpretation is that the reflexive is interpreted as co-referential with the subject. The following statements summarise the syntactic status of *caki-casin*.

- (40) The properties of *caki-casin*:
- a. Syntactic reflexivisation mechanism via cliticisation to a predicate at LF;
 - b. Strict subject orientation;
 - c. Locally bound reflexive.

4.6.3 Section summary

I have explored new proposed binding mechanisms in English and Korean, which are derived via independent constraints on the feature specification of different kinds of reflexives. Now the present study can summarise the three different mechanisms with respect to the three different types of reflexives relevant for this study.

Condition B: A reflexive semantic predicate is reflexive-marked.

Condition A is defined that if a predicate is marked as reflexive in the syntax, it is interpreted as semantically reflexive. Condition B is defined that if a predicate is semantically reflexive, it must be marked as reflexive.

- (41) The feature-based approach for reflexives in English and Korean
- a. English reflexives have an unvalued [VAR] feature, and local-only binding is obtained through the Agree mechanism. For orientation, there is no restriction since subject or non-subject binding is achieved by an operation of local feature valuation;
 - b. Korean reflexive *caki* has a valued feature [VAR: Topic], and a nonlocal nature is obtained through a semantic variable binding mechanism at LF, restricted to topic binding (Gil 1998, 2000). Topic (or subject) orientation is derived by a requirement for binding by a topic, but it appears not to be strict;
 - c. Korean reflexive *caki-casin* has a valued feature [VAR: Reflexive], and local-only binding arises from a reflexivisation mechanism where the reflexive cliticises (or reflexivises) its local predicate head at LF. Strict syntactic subject orientation is obtained.

The new proposals concerning locality and orientation have been advanced that their effects are derived from the independent constraints incorporating the feature specification languages may employ. This study thus formally dissociates locality and orientation and the properties of binding have a significant consequence (Domínguez, Hicks & Song 2012: 277); “*the theory of binding does not specify the concepts of orientation and locality, and indeed the grammar harbours no theory of binding per se.*” Clearly, a UG-based original module of binding theory does not accommodate the rich variation concerning binding properties in this new account. The following table demonstrates the assumptions for the feature specifications of anaphoric binding between Korean and English.

Table 7: Syntactic and semantic properties of Korean and English reflexives

	Korean		English
Reflexive	<i>caki</i> or <i>casin</i> (‘self’)	<i>caki-casin</i> (‘self-self’)	<i>himself</i> (etc.)
Syntactic feature	Valued feature [VAR: Topic]	Valued feature [VAR: Reflexive]	Unvalued feature [VAR: __]
Mechanism	Semantic (Variable binding by Topic)	Syntactic (Reflexivisation via Cliticisation _{LF})	Syntactic (Referential dependency via Agree)
Orientation	Topic-only	Subject-only	No restriction
Locality restriction	Local or long- distance antecedent	Local predicate only	Local antecedent

(Domínguez, Hicks & Song 2012: 276)

4.7 Previous L2 acquisition studies of reflexive binding

4.7.1 Overview

There has been a great deal of research which examines whether L2 learners’ knowledge of reflexive binding is constrained by Condition A of the BT (e.g. Finer & Broselow 1986; Cook 1990; Hirakawa 1990; Finer 1991; Christie 1992; Bennett 1994; Thomas 1989, 1991, 1995; Eckman 1994; Lakshmanan & Teranishi 1994; White 1995; Wakabayashi 1996; White et al. 1997; Bennett & Progovac 1998; Christie & Landolf 1998; Hamilton 1998; MacLaughlin 1998; Yip & Tang 1998; Yuan 1998; Ying 1999; Akiyama 2002; Jiang 2009). These studies have investigated the L2 acquisition of binding constraints following a parameter resetting approach (Manzini & Wexler 1987; Wexler & Manzini 1987), LF-movement of anaphors (Cole, Hermon & Sung 1990; Cole & Sung 1994), and the notion of relativized SUBJECT in determining binding domains (Progovac 1992, 1993). A great number of studies have used Wexler & Manzini’s (1987) parameterised binding approach (e.g. Hirakawa 1990; Finer 1991; Thomas 1989, 1991; Eckman 1994; Lakshmanan & Teranishi 1994; White 1995; Wakabayashi 1996), followed by a LF-movement account (e.g. Christie 1992; Thomas 1995; Christie & Landolf 1998; Yip & Tang 1998; Jiang 2009), and the relativized

SUBJECT account (e.g. Bennett 1994; Bennett & Progovac 1998; MacLaughlin 1998).

A body of these L2 studies has identified or discussed the following points:

- (42)
- a. Access to UG and L1 transfer;
 - b. A cluster of properties of UG (e.g. a relation between subject orientation and nonlocal binding of simplex reflexives);
 - c. Asymmetry of local binding between finite and non-finite clauses;
 - d. Dissociation between locality and orientation;
 - e. Preference for a particular interpretation concerning ambiguity.

Previous studies have largely examined whether learners can reset the appropriate parameter or whether they can successfully acquire the properties of locality and orientation. These studies have shown mixed results in terms of UG access and L1 transfer. The majority of studies have suggested that UG is operative in L2 acquisition (e.g. Finer & Broselow 1986; Finer 1991; Bennett 1994; Hirakawa 1990; Thomas 1989, 1991, 1995; Lakshmanan & Teranishi 1994; Wakabayashi 1996; Bennett & Progovac 1998; MacLaughlin 1998; Yip & Tang 1998; Yuan 1998; Ying 1999; Jiang 2009). In contrast, other studies, such as Christie & Landolf (1998), Eckman (1994) and Akiyama (2002), have claimed that L2 learners are unable to have access to UG. In addition, many studies have shown evidence of L1 transfer in the construction of L2 grammar (e.g. Hirakawa 1990; Eckman 1994; Lakshmanan & Teranishi 1994; Bennett 1994; Bennett & Progovac 1998; Yip & Tang 1998; Yuan 1998; Ying 1999; Jiang 2009), whereas other studies have demonstrated evidence of little L1 transfer (e.g. Finer & Broselow 1986; Finer 1991; Thomas 1995; White 1995). A number of the studies presented above demonstrate a tensed-infinitival asymmetry, whereby higher rates of nonlocal binding are exhibited in non-finite clauses rather than finite clauses, except that of Eckman (1994) and Yip & Tang (1998). Furthermore, many of these studies have shown an apparent dissociation between locality and orientation as locality appears to be acquired before orientation is acquired (e.g. Hirakawa 1990; Finer 1991; Thomas 1989, 1991, 1995; Eckman 1994; Wakabayashi 1996; Christie & Landolf 1998; Yip & Tang 1998; Yuan 1998). Each modification to the standard binding theory has

attempted to explain the particular acquisition pattern of locality and orientation in L2 studies.

Nonetheless, their examination of the acquisition of locality and orientation has not provided a full explanation for this dissociation, since learners' choice for a particular interpretation seems to reflect their *preference*, rather than a proper grammatical judgement. In particular, L2 learners of English showed a preference of subject binding in orientation. Such a preference is also observed in L2 learners of East-Asian languages, namely Korean, Chinese and Japanese, acquiring locality constraints that also have ambiguity. Some L2 researchers used different methods to elicit L2 learners' ambiguous interpretations of reflexives (e.g. Lakshmanan & Teranishi 1994; Wakabayashi 1996; White et al. 1997). Let us reassess the preference regarding ambiguous interpretations.

Table 8: Percentages of responses by English controls and East-Asian L2 speakers regarding orientation in previous studies

Study	English controls (%)			East-Asian L2 speakers (%)		
	subject only	object only	both sub/obj	subject only	object only	both sub/obj
Hirakawa (1990)	67	21	12	73.85	20.31	5.54
Thomas (1991)	52.4	0	47.6	59.33	6.33	17.67
Eckman (1994)	60	not listed	24	66.67	not listed	0
Wakabayashi (1996)	68	6	25	84	10	3
Yip & Tang (1998)	30	0	56.7	58.2	1.53	13.43

Note: The shaded cells indicate expected correct responses.

Table 9: Percentages of responses by Chinese or Japanese controls and English L2 speakers regarding locality in finite clauses in previous studies

Study	Japanese or Chinese controls (%)			English L2 speakers (%)		
	local only	LD only	both loc/LD	local only	LD only	both loc/LD
Thomas (1991)	0	60	10	47.97	6.73	17.1
Eckman (1994)	8.3	58.3	25	29.17	8.3	58.3
Yuan (1998)	19.4	30.6	50	56.05	26.7	17.25

Note: The shaded cells indicate expected correct responses.

In the above tables, the reported responses for native controls and L2 speakers show a preference for a subject antecedent over an object antecedent (except English controls by Yip & Tang 1998), in contexts where an option of both subject/object antecedents is an expected response. Similarly, in L2 contexts whereby either local or nonlocal option is grammatically available (e.g. English learners of Japanese or Chinese), native controls favour long-distance over local binding (except Yuan 1998).⁶⁹ English L2 speakers in this context also exhibited low scores of the option for both local/nonlocal antecedents, showing a relatively high percentage of the local option (except Eckman 1994).⁷⁰ From these studies, the ‘correct’ selection of an object antecedent in the L2 English contexts and of a local antecedent in the L2 Japanese/Chinese contexts is difficult to determine experimentally, since the possibility of more favoured antecedent appears to influence the response.

It is assumed that these results may be attributed to methodological problems arising from the task used. Indeed, previous research has reported that high rates of subject binding only by East-Asian speakers of English are due to learners’ preference (i.e. a task effect).⁷¹ However, they have analysed that high rates of local binding only by L2 speakers of Chinese/Japanese are due to an effect of L1 transfer.⁷² It is still not completely clear as to why previous studies have different positions for L2 speakers’ performance regarding ambiguity in locality and orientation constraints. In other words, it would not seem apparent why preference for local binding is not an effect of the task. In the next section, I will review existing L2 studies on reflexive binding in greater detail.

⁶⁹ Some studies such as Hirakawa (1990) and Lakshmanan & Teranishi (1994) have included Japanese controls in their studies, even though they have examined Japanese learners of English reflexives. Hirakawa and Lakshmanan & Teranishi reported that 9-10% and 57.9% of the native controls accepted ambiguous interpretations respectively.

⁷⁰ The presented rates of each option are for average of low, mid, and high level groups in Thomas (1991). In Yuan (1998), I have only looked at the percentages of the finite neutral contexts, but not pragmatically biased contexts.

⁷¹ Thomas (1991) and White et al. (1997) assert that participants’ choice for subject binding only is not a failure in the acquisition of reflexives but this is a reflection of participants’ preference by the task effect.

⁷² Yuan (1998) argues that English speakers have difficulty in acquiring nonlocal binding properties of Chinese reflexives due to the L1 interference.

4.7.2 L2 acquisition studies under the parameterised binding approach

Many of the previous studies into the L2 acquisition of reflexives were conducted within the parameterised binding approach of Manzini & Wexler (1987) and Welxer & Manzini (1987). These studies have investigated whether L2 speakers are able to acquire the GCP for domain and the PAP for orientation, and whether the Subset Principle is operative in L2 acquisition. Most studies have shown that L2 learners are able to reset parameters of UG (e.g. Finer & Broselow 1986; Finer 1991; Hirakawa 1990; Thomas 1989, 1991; Lakshmanan & Teranishi 1994; Wakabayashi 1996). By contrast, other studies such as Eckman (1994) suggest that L2 speakers are unable to reset UG parameters, with the result that their interlanguage grammar is not constrained by UG. Furthermore, much of the research clearly demonstrates that the Subset Principle does not instantiate in L2 acquisition (e.g. Finer & Broselow 1986; Thomas 1989, 1991; Cook 1990; Hirakawa 1990; Lakshmanan & Teranishi 1994; Akiyama 2002).⁷³ A review of these studies is as follows.

Finer & Broselow (1986) investigated the interpretation of the Governing Category Parameter (GCP) of English reflexives by six adult Korean-speakers, using a picture identification task. The results showed that Korean learners tend to choose the ‘local binding only’ option in tensed clauses, while they demonstrated a mixed response between local and non-local antecedents in infinitive clauses (91.7% in tensed and 63.6% in non-tensed). Finer & Broselow briefly explained that participants may have analysed the non-finite clauses as mono-clauses, so they may have treated the first NP as a subject and the second NP as an object in the PAP. They claim that the Korean learners

⁷³ The idea behind the Subset principle is that (L1 or L2) learners tend to start with the smallest subset grammar in acquiring a language, and then move onto the larger grammar when they receive positive evidence that indicates the contrary. If learners choose a superset grammar incorrectly, they would need negative evidence to lead the speaker back to the target grammar, which is the subset value. Considering that negative evidence is not available, or at least this is not made use of by speakers in the natural language learning environment, learners who initially select the superset grammar will hardly hear anything that directly disproves their incorrect sentences. Therefore, learnability problems arise when L2 learner’s native language is wider than that of the target language due to the limited explicit negative evidence. In contrast to this, if learners begin with the subset value, the grammar can subsequently be maximised on the basis of positive evidence to construct a target grammar. Hence, learners always posit the grammar which generates the subset until positive evidence can be expanded towards the target grammar. While the Subset Principle seems to be available in children’s L1 acquisition and this is assumed to play an important role in language acquisition, much research has reported that this principle is not applicable in L2 acquisition.

have set a value of the GCP which belongs to neither the L1 nor L2. That is, their participants have adopted intermediate values (i.e. either ‘tense’ or ‘indicative tense’) of the GCP, thereby showing a POS phenomenon. The authors argued that the results could be explained only when UG is involved in its acquisition process, and L1 transfer was ruled out as an explanation of the result. This study would seem to be an invaluable piece of work because it is the first SLA study in the reflexive binding, despite having only a small number of participants (and no control group), limited sentence types of the task, and no individual data. This pilot study was followed up by a number of subsequent studies.

Finer (1991) investigated the acquisition of the GCP and the PAP of English reflexives by Korean, Japanese, and Hindi learners using a picture identification task. 97% of the Korean, 91% of the Japanese, and 100% of the Hindi speakers chose ‘local binding only’ in finite clauses; 88% of the Korean, 76% of the Japanese, and 96% of the Hindi speakers selected this option in non-finite clauses. The speakers of Korean and Japanese showed an asymmetry between finite and non-finite sentences, but the L2 Hindi speakers did not (Hindi has similarities with English in terms of the GCP and the PAP). Finer claims that the asymmetry is due to L2 speakers’ different clausal analyses; that is, L2 speakers regard non-finite sentences as double-object constructions, so that they take an object NP as antecedents. All groups of the L2 learners demonstrated a robust preference for the ‘subject binding only’ option (81% of the Korean, 78% of the Japanese, and 96% of the Hindi selected a subject antecedent only; 0% of the Korean, 1% of the Japanese, and 2% of the Hindi chose ‘both subject and object binding’ in the PAP). Extending research by Finer & Broselow (1986), the author argues that UG constrains learners’ grammar, but they compromise between the L1 and the L2 (neither the L1 nor L2) but set a middle value parameter like Russian in the GCP. This study did not include an English control group and did not examine individual variation.

Hirakawa (1990) examined the acquisition of the GCP and the PAP in English by 65 Japanese speakers (divided into four groups according to their school grade), ages 15 to 19, using a multiple-choice comprehension task. The results indicated that the low-level learners accepted nonlocal binding, reflecting their L1 value of the GCP (only 52% of Grade 10 and 50% of Grade 11 chose a local antecedent only); whereas more advanced-

level learners acquired the appropriate value of the GCP (68% of Grade 12 and 77% of Grade 13 chose local binding only). However, their acceptance rate of local binding only was distinct from that of the English control group (99% in finite and 98% in non-finite clauses). The findings showed certain inconsistency in accordance with the grades; for example, the performance of some Grade 10 students was better than those of some in Grade 13, thereby showing individual variation. The author, however, only provided group scores. As regards the results of the PAP, the author argues that the L2 speakers have set the PAP to the English value, since they move from the smaller to the wider setting. However, this is not the case since only 5.54% of the L2 speakers selected the option of ‘both subject/object antecedents’ for the PAP, which is the ‘expected’ response. Hirakawa’s study is mostly consistent with Finer & Broselow (1986) and Finer (1991), for which an asymmetry exists between finite and non-finite clauses (76.95% and 55.14% of the L2 speakers chose local binding only in finite and non-finite clauses, respectively). In addition, the results of the study also exhibit the dissociation pattern of locality and orientation. However, the author rejects the possibility of resetting the intermediate value of the GCP since a large number of the L2 learners set the widest option of the GCP. The author concludes that although the L2 speakers fail to set the value of the GCP correctly, the parameter resetting is possible, “*at least for some learners*” (p.60).

Thomas (1989) examined the interpretation of English reflexives by 97 Chinese speakers and Spanish speakers, ages 16 to 48. 11 native speakers of English served as a control group. The main objective in this study was to explore the issue of the parameter resetting and L1 transfer within Wexler & Manzini’s (1987) framework. The author also considered the semantic and pragmatic influences on the interpretation of English reflexives. Subsequently, both pragmatically ‘neutral’ and ‘biased’ test materials were designed. The results showed that there was no significant difference between the Spanish and the Chinese speakers in interpreting English reflexives. The L2 learners frequently selected pragmatic favoured nonlocal antecedents at the rate of 35.79%, but there was not much difference between the rate of nonlocal binding and local binding (48.6% of the L2 learners chose a local antecedent only in the pragmatically biased sentences). In addition, pragmatic nonlocal favoured contexts did not have an influence on the native controls at all. However, pragmatic contexts had an effect on the choice of

non-subject antecedents both in L2 learners and native controls. These results would seem to suggest that pragmatic biased sentences can induce L2 speakers to allow non-subject antecedents, but these constructions do not appear to influence selection for nonlocal binding.

Thomas (1991) conducted two different experiments, using a multiple-choice comprehension task. The participants were 132 adult L2 learners of English and 41 adult L2 learners of Japanese. The first experiment examined knowledge of English reflexives by 70 Japanese speakers and 62 Spanish speakers, divided into three proficiency levels. The second experiment investigated the interpretation of the Japanese reflexive *zibun* by English speakers and Chinese speakers. These divergent participants have allowed a two-dimensional comparison of the results between L2 learners whose L1 has the same markedness and those whose L1 has a different markedness. The results of the first study showed that the participants' proficiency level did not have any effect in the acquisition of the GCP. Furthermore, the L2 learners' selection for subject binding only was viewed as preference, thus Thomas argued that they did not violate the PAP. The author argues that L2 learners simply do not transfer their L1 grammar into the L2 interlanguage grammar, nor does their L2 acquisition have the similar process to that of L1. The majority of the Japanese learners of English including low levels of proficiency selected a local antecedent only. Similarly, the English learners of Japanese seem to reset the GCP in L2 which is different from their L1 value. These results support that L2 learners have full access to UG in their knowledge of reflexives in an L2. Thomas's study was the first study examining L2 learners with two different L1 backgrounds. It was also the first study comparing participants between a marked L1 (e.g. Korean, Chinese, and Japanese) and an unmarked L2 (e.g. English), and those between an unmarked L1 and a marked L2 in terms of reflexive binding.

Eckman (1994) investigated the acquisition of reflexives by learners of L2 English and L2 Japanese, using a picture identification task. The L2 speakers learning English consisted of different L1 backgrounds such as Arabic, Japanese, Mandarin and Spanish. Interestingly, the results showed that the L2 learners of English from various language backgrounds correctly accepted the 'local binding only' option in both tensed and

infinitival sentences. That is, there was no asymmetry between tensed and infinitival clauses (contra *Finer 1991*) and learners systematically bound the English reflexive to a local subject antecedent. The author also examined an individual data that was not conducted by earlier research (e.g. *Finer & Broselow 1986; Finer 1991; Hirakawa 1990*). *Eckman* argues that the L2 speakers' binding pattern falls outside of the GCP and the PAP, and consequently disconfirms the hypothesis that their interlanguage grammar is constrained by UG. Instead, he suggests that L2 acquisition of reflexive binding could be explained in terms of markedness strategy (L2 learners of English) or L1 transfer (English learners of Japanese). Since locality and orientation constraints differ across languages, this study needs to provide account for the L2 learners' binding behaviour in accordance with different languages (for example, Mandarin and Japanese differs from English whereas Arabic and Spanish are similar to English). However, this study did not provide relevant distinctions across languages.

Wakabyashi (1996) attempted to address the problem regarding participants' selection for only one antecedent in the interpretation of reflexive binding. A group of 40 children, ages 12, and 21 English native speakers participated in the experiment. The author used a sentence judgment task by ranking possible antecedents from 1 for the most preferred and 3 for the less preferred. 87% and 76% of the Japanese L2 learners selected a local antecedent as their first choice in tensed and non-tensed clauses respectively. As for the PAP, 3% of the L2 learners and 25% of the English controls selected both subject/object antecedents as the first choice. The author argues that Japanese L2 learners of English set the GCP and the PAP parameters but these results may not be explained by new theories such as LF movement and relativized SUBJECT accounts since the co-relations between nonlocal binding and non-subject orientation do not seem to occur. In a closer concern of the task itself, it would seem that this type of the task is not able to observe learners' rejection of the antecedents. This point would lead to the issue of whether learners have actually acquired locality and orientation constraints (the author also acknowledged this problem).

Summary

Empirical data collected from the L2 studies presented under the parameterised binding approach demonstrate that knowledge of locality seems to be acquired before

orientation is acquired. Although these previous results show that L2 learners do not always set the correct value of locality and orientation, their grammars are UG-constrained and ‘rogue’ or ‘wild’ grammars do not occur (see Thomas 1991; Eckman 1994). However, these studies did not pay much attention to the issue of wild interlanguage grammars. As a consequence, L2 acquisition research on reflexives under the movement at LF approach has focused more on the examination of what would constitute wild grammars (e.g. Thomas 1995; Christie & Landolf 1998). I will present a review of the L2 studies on this area under the LF movement approach in the next section.

4.7.3 L2 acquisition studies under the LF movement approach

The movement at LF approach claims that the governing categories are not parameterised, but differences in domain and orientation arise from the morphological properties of reflexives, such as simplex vs. complex reflexives. Several L2 studies on reflexives (e.g. Thomas 1995; Christie & Landolf 1998; Yip & Tang 1998) argue for the interaction between locality and orientation constraints under the LF movement approach (Pica 1987; Battistella 1989; Cole, Hermon & Sung 1990; Katada 1991). This kind of analysis builds on Pica’s (1987) observation that long-distance binding implies subject orientation but subject orientation does not imply long-distance binding, which was not addressed in Manzini & Wexler’s (1987) parameterised account.

Christie (1992) and Christie & Landolf (1998) examined the question of whether L2 learners know the cluster properties of locality domain and subject orientation in the interpretation of L2 reflexives, following the LF movement account. The authors collected data via a modified picture identification task. Participants were 92 Chinese/Spanish-speaking learners of English, English-speaking learners of Chinese/Spanish (intermediate and advanced), and 38 English native speakers as a control group. They conducted a cluster analysis designed to measure a degree of correlation among different variables in individual learners’ interlanguage grammar. In particular, they examined the co-occurrence between nonlocal binding of reflexives and subject orientation. Results from the cluster analysis showed that there was no clustering effect between nonlocal binding and subject orientation in either L2 learners

or in controls. The authors conclude that the data would not appear to support the movement anaphors in LF, and consequently do not provide clear evidence that L2 learners have access to UG (i.e. their interlanguage grammar is wild). However, Thomas (1995) suggests an account of why their conclusions are incorrect. Thomas asserts that even though nonlocal binding involves subject orientation under the LF movement account, subject orientation does not always require nonlocal binding or similarly local binding does not always entail non-subject antecedents. Although their analysis claims to provide some linguistic data by measuring various dimensions, it failed to offer a possible answer towards the crucial question of whether L2 learners' acquisition of syntactic properties in reflexive binding has access to UG.⁷⁴

Thomas (1995) examined whether L2 learners of Japanese who demonstrate knowledge of nonlocal binding also know that only subject orientation is allowed in Japanese, and whether L2 learners who know the constraint of non-subject orientation also know that they must be locally bound. The author particularly adopted an LF movement theory as it was assumed to capture the interactions between locality and orientation. The participants consisted of 58 learners of L2 Japanese whose permit nonlocal binding in their L1⁷⁵ (34 in a low proficiency group and 24 in a high proficiency group) from a variety of L1 backgrounds (Chinese, Korean, or Thai) and 34 native speakers of Japanese as a control group. Regarding the different L1 backgrounds, this study predicts that the L2 speakers of Japanese may have the same knowledge as the native speakers of Japanese regarding the interpretation of reflexive binding. The author employed a truth-value judgment task containing a story with a picture. The results showed that the L2 learners at a high-proficiency level significantly allowed nonlocal binding of the reflexive *zibun* by the subject antecedent like the native control group. This empirical finding is consistent with the assumption of the movement at LF approach. In contrast, the L2 learners at a low-proficiency level failed to have nonlocal binding by subject antecedents; they accepted long-distance *zibun* to be associated with an object antecedent, the type of behaviour which should not be allowed by UG under the LF-

⁷⁴ White (2003) notes how a potential problem for Christie & Landolf's clustering approach is that they assume that a two-way relationship between locality and orientation exists, when this is clearly not the case.

⁷⁵ It should be noted that the experimental L2 group is not homogeneous group, since the group was mixed with 32 native speakers of English, six native speakers of French, Spanish or German, and 20 native speakers of Chinese, Korean or Thai.

movement approach. The latter findings reflect the fact that these learners' knowledge of reflexive is not mediated by UG under the LF movement approach. The expected locality-orientation relationship which is presupposed within the LF approach has not been attested either in studies, such as Christie (1992), Christie & Landolf (1998) and Yip & Tang (1998). Overall, after overcoming some methodological problems from Christie's (1992) study, L2 learners seem to acquire a new binding pattern once they achieve a certain proficiency level. Although the effect of clustering properties concerning locality and orientation is closely associated with the LF movement approach, the results do not provide a satisfactory account for precise analysis of dissociation regarding locality and orientation constraints.

Yip & Tang (1998) also investigated the clustering properties of locality and orientation constraints by Cantonese-speaking learners of English, using a sentence judgment task. They found that while the L2 learners initially treated English reflexives as their L1 monomorphemic reflexives, the high proficiency learners correctly performed in locality (but not in subject orientation). The authors acknowledged that the acquisition of local binding does not seem to develop along with the acquisition of non-subject binding due to L1 transfer, which poses an apparent problem for the LF movement account. However, Yip & Tang (1998) did not exclude the possibility of access to UG in L2 speakers as their knowledge of locality is readily acquirable.

Jiang (2009) examined a locality constraint of English reflexives by Chinese speakers at three different levels of proficiency, focusing on the sentence type (finite/non-finite) and the antecedent type (referential/quantified). A story-based truth-value judgment task was used, following White et al. (1997) and Akiyama (2002). The author adopted an LF movement account (e.g. Pica 1987; Battistella 1989), dividing into reflexive types (simplex/complex) and tense types (overt/null), namely a reflexive parameter and a tense parameter respectively. The results showed that an asymmetry between finite and non-finite clauses was shown for the intermediate speakers but not for the beginners and the advanced learners. Interestingly, the author offered a different perspective from the previous studies (e.g. Finer & Broselow 1986; Finer 1991; Matsumura 1994; Akiyama 2002) concerning the asymmetry between finite and non-finite clauses. Jiang suggests that the low-level learners transfer their L1 but the advanced learners reset parameters,

followed by the LF movement account. As for the intermediate learners, the tense type (overt/null) is reset but the reflexive type (simplex/complex) is not, which has resulted in the asymmetry between finite/non-finite clauses. In addition, there was an asymmetry between referential/quantified antecedents for the advanced learners but not for the beginners and the intermediate learners. That is, there were higher acceptance rates of nonlocal binding for the advanced learners only in the contexts of quantified antecedents than in the contexts of referential antecedents (e.g. Bob thought that James was painting *himself* vs. Everyone thought that Bob was painting *himself*). The author has claimed that this result can be attributed to the participants' inability differentiating syntactic knowledge between quantifier raising and reflexive raising. Overall, Jiang argues that the Chinese speakers have not fully acquired the locality constraint, but their interlanguage grammar still falls within UG. Since the Binding Theory is progressing towards the feature-based approach of the Minimalist Program, no mention is made about why the LF movement account is still beneficial over the recent account of reflexive binding. Furthermore, the LF-movement approach is essentially presupposed to the correlation between locality and orientation, but the author does not concern orientation in this study.

Summary

To summarise, the previous L2 studies of reflexive binding within the LF movement account have examined whether L2 learners acquire cluster properties of domain and orientation. Christie & Landolf (1998) suggest that L2 learners fail to cluster, thereby showing that their interlanguage grammar is wild and is not UG-constrained. However, Thomas (1995) specifically provides alternative accounts for Christie & Landolf's (1998) study which propose that the interlanguage is fully UG-constrained. Yip & Tang (1998) and Jiang (2009) also argue that even if L2 speakers cannot fully acquire knowledge of reflexive binding, their interlanguage grammar is mediated by UG. Although the LF-movement approach in L2 reflexive binding is advantageous over previous accounts, this approach does not appear to fully explain the course of L2 acquisition of locality and orientation constraints.

4.7.4 L2 acquisition studies under the relativized SUBJECT approach

The relativized SUBJECT approach of Progovac (1992, 1993) is based on the contrast between morphologically simplex and complex reflexives and a requirement of X-bar compatibility in binding. This approach partly shares the assumptions with the LF movement approach in that nonlocal binding is associated with simplex reflexives, and that it must be subject oriented. However, the relativized SUBJECT framework proposes that nonlocal binding of simplex reflexives is achieved by extending their governing categories to the root clauses through feature sharing Agr. Some researchers such as Bennett (1994), Bennett & Progovac (1998) and MacLaughlin (1998) have examined the L2 acquisition of English reflexives under this approach.

Bennett (1994) and **Bennett & Progovac (1998)** explain the behaviour of reflexives cross-linguistically in terms of an AGR value (overt/null) and a reflexive type (simplex/complex, X^0 /XP), namely an AGR parameter and a reflexive parameter, respectively. Serbo-Croatian X^0 reflexive, *sebi*, can co-refer with a nonlocal clausal subject or a local subject of the NP (e.g. Ivan_i is heard Vesna_j's description *self_{i/j}*); however, *sebi* cannot have nonlocal binding outside a tensed clause (e.g. Sasha_i says that Peter_j reads Ivan_k's letter about *self_{i/j/k}*). Accordingly, their study has assumed that Serbo-Croatian has properties of [+AGR] and an X^0 reflexive, while English contains binding properties of [+AGR] and an XP reflexive. In order to acquire English reflexives, a Serbo-Croatian speaker has to acquire a new reflexive type but not a value of AGR.

Bennett (1994) examined interpretations of English reflexives by Serbo-Croatian adolescent L2 learners, using a picture identification task and a multiple-choice comprehension task. Experimental participants consisted of 20 intermediate younger adolescent learners of English (age 13-15) and 20 advanced older adolescent (age 18-19) learners of English. 20 younger adolescent (age 13-14) English native speakers participated as a control group. The results showed that the L2 learners allowed local binding only in finite embedded clauses, but they allowed LD binding out of infinitival clauses and complex NPs (e.g. Mr. Tall is selling Mr. Short's photographs of *himself*). Bennett suggests that these learners initially analyse the English reflexive as an X^0 reflexive, thereby showing their L1 value (+AGR/ X^0) into the L2. However, the

response pattern regarding object-control infinitival clauses was interesting.⁷⁶ In the comprehension task, a relatively high percentage of the L2 learners selected local binding only in object-control infinitival clauses (80% of the advanced and 63.8% of the intermediate learners), a type which lacks the L1. The author has interpreted this result as indication in support of access to UG. This study, however, did not provide further analysis of the individual learner's response on each sentence type.

MacLaughlin (1998) examined the L2 acquisition of English reflexives by Chinese and Japanese learners. 15 native speakers of Chinese, 10 native speakers of Japanese, and 18 English controls participated in the experiment. The task used in the study was a modified version of the task employed by Lakshmanan & Teranishi (1994) (see Section 6.4.1 for the sample test item of Lakshmanan & Teranishi). Participants were asked to indicate whether the reflexive could refer to various DPs in the sentences. The author also provided individual data, looking at the rate of consistency. Under the relativized SUBJECT approach, English reflexives have properties of [+AGR] and an XP value, whereas Chinese or Japanese reflexives have properties of [−AGR] and an X⁰ setting. Therefore, the learning task for the L2 learners was to set the correct value of the AGR parameter and the reflexive parameter for the L2. The results confirmed previous research such as Finer & Broselow (1986) and Finer (1991), which showed that 7 out of the 15 subjects allowed LD binding in non-finite clauses only but not in finite clauses. That is, the L2 learners' interlanguage grammar is neither the L1 nor the L2, but it does represent the one found in different languages like Russian. MacLaughlin argues that the L2 learners have acquired only the [+AGR] value, but not the property of the XP reflexive. However, it is not clear what causes them to come to reset the AGR parameter but to fail to reset the reflexive type parameter.

Summary

Bennett (1994), Bennett & Progovac (1998), and MacLaughlin (1998) have exhibited that L2 speakers' interlanguage grammar is constrained by UG. Their studies show that

⁷⁶ The following example (1) shows an object-control infinitival clause and the PRO subject of the embedded clause indicates the object of the matrix clause, *John*. On the other hand, the example (2) demonstrates that the PRO in the subject controlled sentence is the subject of the matrix clause.

- (1) Alex forced John [PRO to listen to himself].
- (2) John wants [PRO to look at himself in the mirror].

the AGR parameter (overt/null) has been reset whereas the reflexive type parameter (simplex/complex) has not been reset. As a result, LD binding is permitted since the reflexive is X^0 (simplex) but this can only occur in non-finite clauses where AGR is morphologically null. MacLaughlin suggests that, following Progovac & Connell (1991), the AGR parameter can be reset by the L2 input in which agreement is overt in English (e.g. the form of third person singular agreement found on verbs). Even though the relativized SUBJECT account explains cross-linguistic differences among reflexives via agreement values, they have not provided any independent analysis of whether L2 speakers have fully acquired morphological agreement properties between English reflexives and their antecedents (see White 2003).

4.7.5 Other L2 acquisition studies of reflexive binding

Several L2 acquisition studies on reflexives have explored how methodological or pragmatic factors affect the interpretation of reflexives in L2 acquisition (e.g. White et al. 1997; Yuan 1998; Akiyama 2002). These studies have not adopted any specific theoretical framework upon reflexives. It is noted that the study of White et al. (1997) will be briefly presented in the methodological section 6.4.1.

Yuan (1998) investigated the interpretation of Chinese reflexive *ziji* by English and Japanese speakers, considering both locality and subject orientation. He replicated Thomas's (1989, 1991) studies by employing pragmatically and semantically 'biased' and 'neutral' sentences. 57 English-speakers at two different levels (intermediate and advanced) and 24 intermediate Japanese-speakers learning L2 Chinese participated in the study and a multiple-choice comprehension task was used. Yuan did not rely on any particular syntactic theory to explain Chinese reflexives. Instead, the author attempted to combine not only the movement at LF approach, but also the relativized SUBJECT approach to account for properties of Chinese reflexives. The results of the study have shown that the Japanese speakers have an advantageous position over the English speakers in acquiring LD binding of *ziji*, because Japanese has the same locality conditions as Chinese. The two intermediate L2 groups behaved differently in terms of the properties of *ziji*, reflecting L1 transfer, contrary to the findings of Thomas (1995) and White et al. (1997). The L2 learners in both groups tended to choose pragmatically

favoured antecedents. For example, in sentences where object binding is pragmatically favoured, all the L2 groups allowed non-subject binding in certain degree, which is available in English but not in Chinese or Japanese (e.g. 48.6% of the Japanese group, 52.1% of the intermediate English group, and 32% of the advanced English group). The author also argues that the advanced English speakers have exhibited evidence of acquiring LD binding in support of full access to UG. This suggests that L2 learners learning Chinese reflexive *ziji* may have more problems in acquiring subject orientation than in acquiring locality conditions. However, looking more closely, a relatively high percentage of the advanced English speakers permitted a local antecedent only in the neutral sentences in finite (60%) and non-finite clauses (85.3%), and they allowed a high percentage of nonlocal binding in pragmatically biased sentences. Subsequently, it is not completely clear as to whether these participants have correctly acquired locality conditions regarding Chinese reflexives.

Akiyama (2002) investigated the acquisition of the locality condition on English reflexives by adult Japanese L2 learners of English. The author tested 411 Japanese-speakers at five different levels, using a story-based truth-value judgment task modelled from White et al. (1997). Aware of the asymmetry between finite and non-finite clauses, Akiyama claims that it is not appropriate to examine locality using (object) control verbs since learners interpret the local antecedent as the object of the main clauses. Having considered this point, the verb was restricted to the verb ‘want’ in the experiment; however, the results clearly showed the asymmetry between finite and non-finite sentences through all proficiency levels.⁷⁷ Akiyama argues that the acquisition of English reflexives by L2 learners is very difficult to explain under the UG-access account. However, the overall findings showed that there was an improvement in rejecting LD binding in tensed clauses as the proficiency rose. In addition, a high percentage of the L2 learners in each level accepted local binding only in tensed and non-tensed clauses. The author did not provide a possible explanation about L2 speakers’ correct behaviour regarding a high rate of acceptance for local binding only without evoking UG.

⁷⁷ Matsumura (1994) suggests that there may be a stage in acquiring different English clausal structures, as his study shows that participants at the higher level chose a correct antecedent for the verb ‘tell’ at 92.86%, whereas they selected a very low rate of 14.29% for the verb ‘want’.

Summary

As discussed in full, most previous studies in the L2 acquisition of reflexives have investigated whether L2 speakers' binding properties of locality and orientation are constrained by Condition A of the binding theory. However, it seems likely that the recent L2 studies on reflexive binding (e.g. Akiyama 2002; Jiang 2009) avoid the issue pertaining to subject orientation, as different modifications to the binding theory under the GB framework cannot provide an adequate account for the pattern of dissociation of locality and orientation constraints. In this study, therefore, I follow a Minimalist feature-based reinterpretation of the binding conditions (e.g. Hicks 2009) which argues that local binding of English reflexives can be achieved by an operation of local feature checking (or valuation) via the Agree operation (Chomsky 2000, 2001). The following Table 10 summarises previous L2 acquisition studies concerning anaphoric binding.

Table 10: Previous L2 acquisition studies of reflexive binding

Study	Method	L1	L2	Learning task	Results
Finer & Broselow (1986)	Picture identification	Korean	English	GCP	access to UG, but set intermediate value of GCP
Thomas (1989)	Multiple choice	Chinese, Spanish	English	GCP, PAP/ Pragmatic effect	access to UG, pragmatic stimuli affect PAP, not GCP
Hirakawa (1990)	Multiple choice	Japanese	English	GCP & PAP	access to UG (for some learners)
Finer (1991)	Picture identification	Korean, Japanese, Hindi	English	GCP & PAP	access to UG, but set intermediate value of GCP
Thomas (1991)	Multiple choice	Japanese, Spanish	English	GCP(tensed) PAP	access to UG
		English, Chinese	Japanese	GCP & PAP	
Eckman (1994)	Picture identification	English	Japanese	GCP & PAP	no access to UG, no asymmetry between finite & non-finite
		Arabic, Japanese, Mandarin, Spanish	English	GCP & PAP	
Bennett (1994)	Picture & Multiple choice	Serbo-Croatian	English	locality (reletivized SUBJECT)	access to UG

Lakshmanan & Teranishi (1994)	Sentence-judgment	Japanese	English	GCP	access to UG
Thomas (1995)	Truth-value story with picture	Chinese, Korean, Thai	Japanese	locality & orientation (LF movement)	low group: no LF movement high group: cluster properties of LD & subject binding, so access to UG
Wakabayashi (1996)	Ranking preference	Japanese	English	GCP & PAP	access to UG
White et al. (1997)	Truth-value story & picture	Japanese, French	English	locality & orientation	both tasks were unable to derive learners' ambiguity
Christie & Landolf (1998)	Picture identification	Chinese, Spanish	English	locality & orientation (LF movement)	no cluster properties of LD & subject orientation, so no access to UG
MacLaughlin (1998)	Sentence judgment	Chinese, Japanese	English	locality & orientation (reletivized SUBJECT)	neither L1 nor L2, but UG-constrained
Yip & Tang (1998)	Sentence judgment	Chinese (Cantonese)	English	locality & orientation (LF movement)	no cluster properties of LD & subject orientation (but access to UG is possible)
Yuan (1998)	Multiple-choice	English, Japanese	Chinese	locality & orientation	UG-constrained, more problem in orientation than locality for <i>ziji</i>
Akiyama (2002)	Truth-value story	Japanese	English	locality	no access to UG
Jiang (2009)	Truth-value story	Chinese	English	locality (LF movement)	access to UG

4.8 Summary of Chapter 4

This chapter has shown that the reflexive system in Korean is a complex phenomenon in comparison to English. The most significant distinction between English reflexives and Korean reflexives is the fact that the semantic function of *caki* in Korean allows for nonlocal binding. While the phase-based feature checking mechanism has been

established for the local phenomenon of the English anaphor, the bound variable analysis employing the QR process (or topicalisation) explains the nature of local or nonlocal reflexivisation in Korean. Under the feature checking account, both subject and non-subject for English reflexives can be possible antecedents due to the operation of Agree. In consequence, this relation can deduce the empirical generalisation that non-subject orientation entails only local binding. The bound variable analysis for *caki* does not straightforwardly explain subject orientation because several complex factors such as syntax, semantics and pragmatics are at play. The property of topic binding may derive subject orientation but this is not always an absolute one. However, Han, Storoshenko & Walshe (2010) provide evidence that subject orientation observed for *caki* in these authors' corpus study is likely to be a default for Korean reflexives in general. There is another separate binding mechanism for the Korean local anaphor *caki-casin* that is arised from the relevant feature cliticising to a local predicate head. Strict subject orientation is derived from the mechanism of the reflexivisation feature [VAR: Reflexive] of *caki-casin*.

Thus far, I have shown that the binding mechanism in each language is related to the feature specification where the language employs. Different languages may employ an independent binding system which results in different compositions of lexical features. Consequently, the binding theory is not necessarily required for binding relations across languages, which in turn means that binding theory is not strictly required anymore. Most previous SLA studies on anaphoric binding have assumed that the mechanism responsible for determining binding relations of reflexive is based on Condition A of the BT, which is regarded to be universally available for all languages. However, this assumption cannot apply to the current feature-based account, since each language uses language-particular binding constraints which are independently proposed. More importantly, in order to obtain correct knowledge of locality and orientation constraints in English, learners initially have to acquire the appropriate featural combination of the reflexive pronoun which is determined through the syntactic operation Agree. Since the Agree operation is provided by UG, these two conditions will not have to be learnt separately. If L2 speakers learn the relevant feature configurations of the target language, locality and orientation will naturally develop. In Chapter 6, I will provide an

empirical study which is undertaken to prove whether the new proposed feature-based account in fact reflects the L2 acquisition of English binding constraints.

CHAPTER 5

A STUDY OF THE OVERT PRONOUN CONSTRAINT IN L2 ACQUISITION

This chapter provides an experimental study of L2 linguistic knowledge of the OPC by English speakers of Korean. As presented in Chapter 2, one of the main arguments of generative L2 acquisition research is whether adult L2 acquisition is constrained by UG. As this study aims to analyse L2 learners' underlying mental architecture of grammar, this study seeks to establish inclusive evidence concerning whether innate mental grammars support successful adult L2 acquisition. For the learning tasks in the acquisition of interpretative restrictions on overt pronouns, English speakers of Korean must accept a disjoint reading, and reject a bound reading in the relevant constructions. The latter presents a challenge, since the learning situation constitutes a learnability problem.

Although the OPC effects represent a clear POS phenomenon in L2 speakers, it is predicted that the contrast between null and overt pronouns in quantifier binding can be successfully acquired because this syntactic constraint is innate and operative from an early stage, assuming Full Access to UG (Schwartz & Sprouse 1994, 1996). This study examines empirical data collected from two English L2 groups and a Korean control group. The task employed in this study is a co-reference comprehension task and a story-based translation task. The remainder of this chapter is followed by research questions, hypotheses, a detailed description of the experimental design of the tasks, and results of the study. Finally, this chapter ends with a discussion of the findings.

5.1 Research questions

The main research question in this study is to investigate whether English-speaking learners of Korean fully acquire the OPC, which is not present in their native grammar. If learners show nativelike representations of the OPC in Korean, the current study should answer how they arrive at this grammar. This study investigates the following research question:

Do adult English-speaking learners of Korean achieve a nativelike success in grammatical competence with respect to the syntactic restriction of the OPC?

In respect to the main research question, the two subquestions will be investigated as follows:

1. Do adult English-speaking learners of Korean show nativelike knowledge of the OPC in both subject and object positions?
2. Do adult English-speaking learners of Korean show nativelike knowledge of the OPC in subject position only but not in object position?

This study investigates the research questions by testing the predictions made by ‘Full Access’ of the Full Transfer/Full Access (FT/FA) hypothesis proposed by Schwartz & Sprouse (1994, 1996). The FT/FA hypothesis predicts that the L1 grammar constitutes the L2 initial state, including L1 parameter settings, where cross-linguistic differences exist between the L1 and the L2. Consequently, learners’ interlanguage grammar may contain structures that are not allowed in the target grammar.

The FT/FA is known as failure-driven development (Schwartz 1998). That is, when learners are confronted with positive evidence in the L2 input that cannot be parsed through the L1 grammar, they resort to principles constrained by UG to accommodate the input. Hence, it is possible that certain syntactic properties that are not present in the L1 grammar could eventually be acquirable. The final outcome of L2 acquisition is predicted to be a grammar that is UG-constrained in its entirety; but which is not necessarily nativelike (see Section 2.2.3.2). It should be noted that the FT/FA hypothesis is, specifically, a theory of the initial state of L2 development. However, the current study does not involve beginners in the experiment, so I initially focus on testing the validity of the ‘Full Access’ part of the FT/FA.

5.2 Hypotheses

In this study, I make two alternative hypotheses based on the aforementioned research questions. Note that these hypotheses are not compatible with each other.

1. **Hypothesis 1:** L2 learners show nativelike knowledge of the OPC in both subject and object positions.

Given the possibility of *pro* drop in subject and non-subject positions in embedded clauses, this study assumes that the OPC is instantiated in L2 Korean, irrespective of pronoun position. It is predicted that L2 speakers (both intermediate and advanced) in this study would permit a disjoint interpretation only for the embedded overt pronoun (subject or object) in QDP/*wh*-word contexts and at the same time reject a bound variable interpretation, thus complying with the OPC. This hypothesis does not expect dissociation where L2 speakers have knowledge of the OPC in subject position but not in object position.

2. **Hypothesis 2:** L2 learners show nativelike knowledge of the OPC in subject position but not in object position.

This hypothesis is based on the analysis of null object in Chinese (Huang 1984, 1989), for example. If L2 speakers do not realise a null object as a *pro* but a variable, they would not show the OPC effect in object position, thereby resulting in a pattern of the asymmetry between subject and object pronouns. It is predicted that L2 speakers would not allow a bound interpretation for the embedded overt subject pronoun in QDP/*wh*-word contexts. However, they would permit both disjoint and bound interpretations for the embedded overt object pronoun in these sentence types.

5.3 Participants

There were three groups of subjects in this study: 19 intermediate English-speaking learners of Korean, 22 advanced English-speaking learners of Korean, and 20 native

speakers of Korean. Details of the L2 learners' age, the length of Korean study, and the length of residence in Korea are presented in Table 11.

Table 11: The participants' language background information

Question	Option	Intermediate (n=19)	Advanced (n=22)	Total (n=41)
Gender	Female	12	13	25
	Male	7	9	16
Age	under 25 years	12	15	27
	25-35 years	4	5	9
	35-45 years	3	2	5
Length of Korean study	1 year	4	0	4
	1-2 years	9	0	9
	2-3 years	4	7	11
	3-4 years	1	9	10
	4-5 years	0	2	2
	over 5 years	1	4	5
Length of residence in Korea (residence =22, no residence=19)	no residence	17	2	19
	under 1 year	1	12	13
	1-2 years	1	5	6
	2-3 years	0	2	2
	3-4 years	0	0	0
	4-5 years	0	1	1
	over 5 years	0	0	0

All the L2 participants were recruited from the School of Oriental and African Studies (SOAS), University of London, UK, through personal contact with the help of the staff at the SOAS; the Korean controls were undergraduates in Korea at the time of testing. The prerequisites to be included in the task were that learners had to be native speakers of English studying Korean at a minimum of intermediate level. The 28 subjects were undergraduate or postgraduate students in Korean Studies. 13 subjects were language learners enrolled on the Korean language in the SOAS language centre. The reason I did not include a group of beginner learners was because of the difficulty of the experimental task itself. Even though past OPC studies such as Pérez-Leroux & Glass (1999) included elementary-level learners in their experiment, I found that the elementary-level learners of Korean I piloted the task with had very limited knowledge

of the basic structure of the target grammar and their knowledge of relevant vocabulary was not sufficient to complete the task.

The L2 participants were divided into two groups according to their class contact hours; this was equivalent to their level of proficiency in Korean. A placement test was not conducted in this study, since learners were already placed into different levels by the school's own proficiency test. In addition, only those learners who had been placed at least intermediate level of proficiency were invited to participate in the study. Those learners who had received at least 252 contact hours of instruction were grouped as advanced-level learners; those who had had a minimum of 132 contact hours were placed as intermediate-level learners. The learners' age ranged from 20-45 years. The L2 subjects had all started learning Korean after 18 years of age. 17 subjects in Korean Studies had experienced living in Korea by means of the Leave-Year-Aboard course and they had taken Korean courses in a Korean University. 5 subjects had also stayed in Korea for different purposes and also studied Korean in different institutions. 19 of the 41 subjects had no experience living in Korea.

5.4 Methodology

5.4.1 Task 1: The co-reference comprehension task

A co-reference comprehension task was used to assess participants' knowledge of the OPC. The test design was modelled on Kanno's (1997, 1998) OPC task for L2 Japanese speakers. In the task, the native English-speaking participants first read a written stimulus of Korean sentences followed by two Yes/No questions in each item.

Participants then had to judge whether a given question was acceptable or unacceptable by ticking one of two options. They were also told that it is possible to respond with a double 'Yes' or 'No' on the same stimulus sentence. This task was slightly different from that of Kanno (1997, 1998) (see Section 3.4.1), as I attempted to design the task that could improve the rate of the 'both bound/disjoint readings' option in relevant contexts. They were given time to practise four example items which do not cover any of the test types. The task was presented in Korean. An example test item in English is shown in (1) below.

(1) Someone said that he is going to buy a new car.

Q: Who do you suppose is going to buy a new car?

a. Could it be the same as ‘someone’? ☐ YES ☐ NO

b. Could it be another person? ☐ YES ☐ NO

There were at least four ways in which participants could answer each question as follows:

- (2)
- a. They could select ‘Yes’ for (a) and ‘No’ for (b): this was coded as a ‘bound reading only’.
 - b. They could select ‘No’ for (a) and ‘Yes’ for (b): this was coded as a ‘disjoint (or free) reading only’.
 - c. They could select ‘Yes’ for both (a) and (b): this was coded as ‘both bound/disjoint (free) readings’.
 - d. They could select ‘No’ for both (a) and (b): this was coded as ‘neither’.

If L2 speakers chose ‘No’ for (a) and ‘Yes’ for (b), this was coded a disjoint interpretation, which is the correct answer in the target contexts (e.g. QDP/*wh*-word matrix subjects+embedded overt pronouns). The test sentences of the task consisted of 36 items which were categorised into 8 different sets according to the matrix subject (quantified DP or referential DP), the syntactic position of the pronoun (embedded subject pronoun or embedded object pronoun), and the form of the pronoun (overt or null). As for the overt pronoun, a third person pronoun *ku* ‘he’ or *kunye* ‘she’ was used in subject position; *ku* ‘him’ or *kunye* ‘her’ was used in object position. It is noted that the form of the overt subject pronoun and the overt object pronoun is the same in Korean. In the design of the task, three different QDPs/*wh*-words were used and each quantifier/*wh*-word was used twice: *nwukwunka* ‘someone’, *nwukwuna* (or *motwu*) ‘everyone’, and *nwukwu* ‘who’ (see Table 12). This study also examined whether different quantifiers have different effects on the operation of the OPC.⁷⁸

⁷⁸ Previous studies such as Marsden (1998) investigated an effect of the use of different quantifiers in the instantiation of the OPC. In this respect, Lozano (2002) selected a representative set of ‘core’ quantifiers (e.g. ‘each’ and ‘nobody’), which allow for a bound variable interpretation with null pronouns.

Table 12: Different quantifiers used in the comprehension task

QDP_i/wh_i + overt subject pronoun*_i	QDP_i/wh_i + overt object pronoun*_i
nwukwu _i (who) + ku* _i (he)	nwukwu _i (who) + ku* _i (him)
nwukwunka _i (someone) + ku* _i	nwukwunka _i (someone) + ku* _i
nwukwuna _i /motwu _i (everyone) + ku* _i	nwukwuna _i /motwu _i (everyone) + ku* _i
QDP_i/wh_i + null subject pronoun (∅)_i	QDP_i/wh_i + null object pronoun(∅)_i
nwukwu _i (who) + ∅ _i	nwukwu _i (who) + ∅ _i
nwukwunka _i (someone) + ∅ _i	nwukwunka _i (someone) + ∅ _i
nwukwuna _i /motwu _i (everyone) + ∅ _i	nwukwuna _i /motwu _i (everyone) + ∅ _i

Table 13 below shows the eight different sentence types and their possible interpretation in English and in Korean

Table 13: Type of sentences used in the comprehension task

Type of sentences	Possible interpretation for embedded pronoun	
The overt subject pronoun context	English	Korean
Type 1: QDP + overt subject (n=6): OPC context e.g. Someone said that she used to live in London.	bound or disjoint	disjoint only
Type 2: QDP + null subject (n=6) e.g. Everyone said that ∅ would fail the exam.	not allowed	bound or disjoint
Type 3: RDP + overt subject (n=3): e.g. Peter thinks that he is the smartest in the class.	bound or disjoint	bound or disjoint
Type 4: RDP + null subject (n=3) e.g. Sarah reported that ∅ was ill yesterday.	not allowed	bound or disjoint
The overt object pronoun context	English	Korean
Type 5: QDP + overt object (n=6): OPC context e.g. Who said that Mary loved him?	bound or disjoint	disjoint only
Type 6: QDP + null object (n=6): e.g. Everyone said that Mr. Holmes interrogated ∅.	not allowed	bound or disjoint
Type 7: RDP + overt object (n=3) e.g. Sophie said that Mary assured her.	bound or disjoint	bound or disjoint
Type 8: RDP + null object (n=3) e.g. Mary said that Sophie punched ∅ in the café.	not allowed	bound or disjoint

Note: The ‘∅’ means a null pronoun.

Type 1 (QDP+overt subject) and Type 5 (QDP+overt object) are the main sentence types to test the OPC, since the Korean interpretation of these types of sentence differs from those of the English ones. The overt embedded argument cannot be bound by the quantified/*wh*-operator matrix subject in Korean, so the only correct response is a disjoint interpretation in these two structures. However, in English, either a bound or disjoint interpretation is possible. If English speakers of Korean acquire the OPC structure, they would accept a disjoint reading and would not accept a bound reading. If they choose a bound reading or both (bound/disjoint) readings, it would be assumed that they have not acquired the interpretive contrast between overt and null pronouns in the quantifier-binding contexts.

Type 2 (QDP+null subject) and Type 6 (QDP+null object) are not subject to the OPC because the embedded subject pronoun or object pronoun is realised as an empty element (the Korean null subjects or null objects in the embedded clauses can have either a bound or disjoint interpretation). The null pronouns in Type 2 and Type 6 behave similarly to English equivalents of Type 1 (QDP+overt subject) and Type 5 (QDP+overt object), respectively. Type 2 and Type 6 are not permissible in English since null arguments are not allowed in English sentences. Since the bound reading or both readings are allowed in Type 2 and Type 6, this study would be able to predict that L2 learners would make a contrast between Type 1 and Type 2 and between Type 5 and Type 6. That is, L2 learners who do not accept a bound reading at all in Type 1 and Type 5 would permit a bound reading or both bound/disjoint readings more or less in Type 2 and Type 6. There would be a significant difference in choosing a bound or both readings between Type 1 and Type 2 and between Type 5 and Type 6. Testing these sentence types will allow us to find out whether L2 learners know the distinction between null and overt pronouns in QDP/*wh*-word contexts. Type 1, 2, 5, and 6 sentences are comprised of six test items respectively.

Type 3 (RDP+overt subject), Type 4 (RDP+null subject), Type 7 (RDP+overt object), and Type 8 (RDP+null object) are not constrained by the OPC since the matrix subject is not quantificational (a QDP or a *wh*-phrase). Like Type 2 (QDP+null subject) and Type 6 (QDP+null object) sentences, the embedded overt pronoun (Type 3 and 7) and the embedded null pronoun (Type 4 and 8) in the referential DP context can have either

a bound or disjoint reading. Since the interpretation of Type 3 and Type 7 is the same as its English counterparts, testing these sentence types is not directly relevant to the OPC. The main purpose of testing Type 3 and 7 is to see whether L2 learners can differentiate between the QDP/*wh*-phrase contexts and the RDP contexts for the overt pronoun. In other words, this study will observe whether L2 learners can have a bound reading or both readings for the overt pronoun, contrary to Type 1 and Type 5 structures. It is predicted that there must be an acquisition pattern in these sentence types like Type 2 and Type 6, if L2 learners have sensitivity to the OPC.

Type 4 and Type 8 are not permitted in English, again because these types contain null arguments. The embedded null subjects or null objects in the RDP contexts can be interpreted as co-referential with either a matrix RDP or an antecedent outside the sentence. The aim of testing these sentence types is to observe whether there is a similar acquisition pattern between Type 2 and Type 4 and between Type 6 and Type 8 respectively. This study predicts that L2 learners' performance between these two sentence types would be identical to each other because both types have null pronouns that do not exist in their L1, regardless of the types of the matrix subject. It should be noted that the number of the test batteries in Type 3, 4, 7, and 8 consists of three test items respectively.⁷⁹ I believed that the reduction of the number of the test item in the RDP contexts would not greatly affect the L2 learners' knowledge of the OPC, since the RDP contexts do not directly relate to the OPC effect.

5.4.2 Task 2: The story-based translation task

The second task is a story-based translation task modified from Pérez-Leroux & Glass (1999) and Rothman & Iverson (2007b) for L2 Spanish speakers. The goal of the translation task is to check whether L2 participants translate overt pronouns in English into null pronouns in Korean when the provided story is biased to favour a bound interpretation in the QDP contexts. In this task, a short story was presented to the participants in their L1, English; then, the subjects were provided with one question along with an answer in accordance with a story. The L2 learners were asked to

⁷⁹ Initially, a version of the co-reference comprehension task which contains six test items in each sentence type (a total of 48 test items) was piloted with five English native speakers. However, they found the task too time-consuming, thus the number of test items in the RDP contexts was reduced.

translate the answer into L2 Korean with the most natural form. The English sentence that L2 learners had to translate was biased to favour either a bound or disjoint reading. If the sentence biases a bound interpretation when the matrix subject is a quantified DP (QDP), responses should strongly disfavour the overt pronoun due to the OPC effect. Thus, the translation of such sentences should result in an empty referent *pro* for the embedded subject or embedded object. Conversely, when the matrix subject is a QDP and the context is biased to favour a disjoint interpretation, either kind of pronoun is grammatical. There were four types of bi-clausal sentences to be translated after a short context and a question presented in the L1 English, as can be seen in (3). Each sentence type consisted of four stories and a total of 16 stories for this test were provided. Following Pérez-Leroux & Glass (1999), the translation was prompted by providing the matrix clauses to be translated, which corresponded to a quantifier with a matrix verb.⁸⁰ The referential DP (RDP) matrix subject contexts were not included in this task following previous research (e.g. Pérez-Leroux & Glass 1999). The Korean native controls took a modified version of the task since the L2 version was a translation task. The stories were identical to the L2 task; however, instead of the translation of the sentence, the Korean native controls had to judge whether the sentence provided was natural or not, based on the context. The following examples illustrate different sentence types used in the translation task. It should be noted that the following four types of sentence do not correspond to the types of context that I outlined in the co-reference comprehension task.

(3) Sample test items in each sentence type for the translation task

a. **Type 1:** bound reading for a subject pronoun with a QDP: OPC contexts

Each of my children gets £1 per week from their dad. That's the only money they get. However, my children always complain about their small amount of pocket money

Q: Do the children say that they have got enough money?

A: *No, each child says that he wants more money.*

아니요, 각각의 아이는 _____ 말해요.

⁸⁰ Pérez-Leroux & Glass (1999) provided the first word(s) in the translation, which corresponded to a quantifier.

- b. **Type 2:** disjoint reading for a subject pronoun with a QDP: no OPC

The head teacher has announced that everyone in the school has the chance to learn how to swim. All the parents think that the head teacher is enthusiastic about the children's learning.

Q: What do parents reckon about the head teacher?

A: *Every parent reckons that he is a conscientious teacher.*

모든 부모는 _____ 생각해요.

- c. **Type 3:** bound reading for an object pronoun with a QDP: OPC contexts

A large amount of money was stolen from the bank last night.

None of the doors or locks were broken into. The police suspected all the bank clerks so they decided to investigate them. However, all the bank clerks resisted the investigation.

Q: What did each bank clerk say about the investigation?

A: *Each bank clerk said that the police should not interrogate him.*

각각의 은행원은 _____ 말했어요.

- d. **Type 4:** disjoint reading for an object pronoun with a QDP: no OPC

Korean Journalist Sarah Kim has worked in several different countries. She investigated the power of the press around the world; consequently, she was awarded a special prize in Broadcast Media. Many journalists reported that she was praised and respected by many audiences.

Q: What did the journalists report about Sarah Kim?

A: *Many journalists reported that people admire her a lot.*

많은 기자들은 _____ 보도했어요.

In the story-based translation task, various kinds of quantifiers (e.g. *every*, *each*, *many*, *someone*, and *everyone*) were used as this study intended to provide a variety of contexts with the L2 participants. Unlike the co-reference comprehension task, the translation task did not examine the effect for the use of different types of quantifiers as I already provided a translation of the matrix clause which contains a quantifier (i.e. the participants were only required to translate the embedded clause).

The following table 14 shows four types of sentences that have to be translated in the task and its possible translation of the overt pronouns in Korean.

Table 14: Sentence types and possible translation in the translation task

Type of sentences	Possible translation	
	English	Korean
Type 1 (n=4): A bound reading is favoured. QDP + overt subject pronoun: OPC context e.g. Each child says that he wants more money.	overt pronoun only	null pronoun only
Type 2 (n=4): A disjoint reading is formed. QDP + overt subject pronoun: no OPC e.g. Every parent reckons that he is a conscientious teacher.	overt pronoun only	overt or null pronoun
Type 3 (n=4): A bound reading is favoured. QDP + overt object pronoun: OPC context e.g. Each bank clerk said that the police should not interrogate him.	overt pronoun only	null pronoun only
Type 4 (n=4): A disjoint reading is formed. QDP + overt object pronoun: no OPC e.g. Many journalists reported that people admire her a lot.	overt pronoun only	overt or null pronoun

The OPC restricts the use of the embedded overt pronouns in sentences of Type 1 and Type 3 in Korean. The expected target translation of the sentence requires a null pronoun because the story is created to be biased towards a bound variable interpretation whereby the embedded subject or object pronoun is bound to the QDP matrix subject. The target translation of Type 1 is exemplified in (4). Since the Korean translation in Type 1 and Type 3 sentences should contain a null subject and a null object respectively, the translation (4a) in Type 1 is the target translation sentence. If the overt subject pronoun is used in this translation like (4b), this sentence would be ungrammatical.

- (4) To translate: Each child says that he wants more money.
- a. kakkakuy ai_i -nun \emptyset _i te manun ton-ul wenhanta-ko malhanta.
each child-TOP \emptyset more money-ACC wants-COMP says
 - b. kakkakuy ai_i -nun **ku**_{*i} -ka te manun ton-ul wenhanta-ko malhanta.
each child-TOP **he**-NOM more money-ACC wants-COMP says

It should be remembered that, as presented in Chapter 3, the reflexive pronoun *caki* is also available in place of a null pronoun in (4a) since the anaphor can be bound by the QDP. If L2 speakers produce a reflexive pronoun instead of a null pronoun, their use of *caki* would be regarded as a correct response for Type 1 and Type 3.

If the OPC is a principle of UG, this study predicts that English speakers would be sensitive to the OPC constructions (e.g. Type 1 and Type 3) in L2 Korean. In contrast to Type 1 and Type 3, Type 2 and Type 4 sentences allow for either an embedded null or overt pronoun because the sentence is biased to favour a discourse-referential disjoint interpretation; but, in English, the embedded overt pronouns are always required. In order to further obtain L2 speakers' use of the overt pronoun in Type 2 and Type 4, the story provided alternative antecedents (such as 'head teacher' in Type 2 and 'Sarah Kim' in Type 4). That is, the given stories in Type 2 and Type 4 are presented to be biased towards production of an overt pronoun. Accordingly, the overt subject pronoun *ku* 'he' in Type 2 sentences (e.g. 3b) and the overt object pronoun *kunye* 'her' in Type 4 sentences (e.g. 3d) are expected to be produced. The following instance in (5) elicits a phonologically overt subject pronoun like (5a), which is an ideal response for this sentence type. Although L2 learners produce an empty pronoun in Type 2 and Type 4 as in (5b), this is not ungrammatical.

- (5) To translate: Every parent reckons that he is a conscientious teacher.
- a. Expected target translation:
motun_i pwumo-nun **ku**_i -ka sengsilhan kyosa-lako sayngkakhanta.
every parent- TOP **he**- NOM conscientious teacher-COMP reckons
 - b. motun_i pwumo-nun \emptyset _i sengsil-han kyosa-lako sayngkakhanta.
every parent- TOP \emptyset conscientious teacher-COMP reckons

If L2 speakers have the OPC restriction operative in their interlanguage grammar, this study predicts that L2 speakers would show a categorical distinction between Type 1 and Type 2 sentences and between Type 3 and Type 4 sentences in producing null and overt pronouns. That is, if L2 learners generate null subject pronouns in Type 1 and Type 3, and they produce overt subject pronouns in Type 2 and Type 4 respectively, this study would confirm that L2 learners have knowledge of the OPC in both subject and object positions. Yet it is important to note that that even if L2 learners produce null pronouns in Type 1 and Type 3 and they also use null pronouns in Type 2 and Type 4, this does not mean that their grammar does not apply the OPC correctly.

5.5 Procedures

Each L2 participant was tested on two separate occasions. The tests were administered in small groups or individually by individual appointment in a classroom. In the first meeting, the participants were asked to read a participant information sheet and sign a consent form. Prior to the test, all the informants were asked to fill out a questionnaire about their previous experience of learning Korean including their general background (see Appendix 1 for the background questionnaire). They were informed that they could withdraw from the test at any time, and were asked to mark the same initials in both tasks to allow matching of each individual subject. All the test items were illustrated in random order in the test papers. Written and oral instructions were given; especially, L2 learners were provided with test papers which included English instructions and the meaning of the some words. They were also informed that the purpose of the test was to examine each participant's first intuition about certain Korean sentences, so they should not spend too much time on each item. However, there was no time limit for any of the tests. The participants completed the comprehension task in around 30-45 minutes and they finished the translation task in approximately 20-30 minutes. After the subjects finished the first task, the next meeting was scheduled for the second task.

5.6 Results of the co-reference comprehension task

This study observes the experimental data at the group level first. As for the overt subject pronoun constraint, the experimental data scrutinized participants who selected a disjoint reading only and concurrently rejected a bound reading in Type 1 (QDP+overt subject). If participants show a disjoint reading and reject a bound reading in Type 1 sentences, this study assumes that they are treated as having the OPC activated. I subsequently proceeded to examine how they perform in Type 2 (QDP+null subject) sentences and whether there is a significant contrast between Type 1 and Type 2. If L2 participants reject a bound reading consistently in Type 1, a significant difference for acceptance of the bound reading would be shown between Type 1 and Type 2 sentences as Type 2 allows bound or both interpretations. Further investigation is then conducted; I observe how English speakers behave in Type 3 (RDP+overt subject). As mentioned, the reason for including Type 3 sentences in the experiment is to investigate whether the L2 learners have a disjoint reading preference for the overt subject pronoun. Therefore, testing Type 2 and 3 is able to draw a direct comparison against Type 1 on how they interpret the overt/null subject pronoun. As for the overt object pronoun constraint, I look at the data in the same way as the overt subject pronoun constraint.

5.6.1 Group results

This section reports the quantitative results of the experiment. A one-way ANOVA with a post-hoc Tukey HSD comparison was run to observe the across-group comparison. In order to establish the within-group comparison, a paired-sample *t*-test was conducted. The alpha level was conventionally set at 0.05 to ensure a 95% confidence.

5.6.1.1 Group results of Type 1 to Type 4

The following table shows the group results from Type 1 to Type 4. Type 1 is a major test sentence type in the investigation of the OPC; the only possible response is a disjoint reading only. Since the OPC does not apply to Type 2, 3, and 4, the possible answer for these types is either a bound or disjoint interpretation.

Table 15: Acceptance rates of overt and null forms in embedded subject position with QDP and RDP contexts (Type 1 to Type 4)

Type of sentences	Option	L2 intermediate (n=19)		L2 advanced (n=22)		Korean controls (n=20)	
		no.	%	no.	%	no.	%
Type 1 (QDP+overt subject, n=6)	bound	13	11.40	3	2.27	2	1.67
	disjoint	87	76.32	104	78.79	117	97.50
	both	12	10.53	25	18.94	0	0
	neither	2	1.75	0	0	1	0.83
Type 2 (QDP+null subject, n=6)	bound	43	37.72	46	34.85	79	65.83
	disjoint	28	25.44	5	3.79	28	23.34
	both	40	35.09	81	61.36	12	10.00
	neither	3	1.75	0	0	1	0.83
Type 3 (RDP+overt subject, n=3)	bound	13	22.81	4	6.06	14	23.33
	disjoint	36	63.16	53	80.30	40	66.67
	both	7	12.28	9	13.64	6	10.00
	neither	1	1.75	0	0	0	0
Type 4 (RDP+null subject, n=3)	bound	36	63.16	29	43.94	54	90.00
	disjoint	2	3.51	4	6.06	2	3.33
	both	18	31.58	33	50.00	4	6.67
	neither	1	1.75	0	0	0	0

Note: The shaded cells indicate expected target responses in each sentence type.

The graph below shows the percentages of acceptance for the bound or both interpretations across groups for the four sentence types. Recall that the OPC does not allow a bound interpretation in Type 1; so the option of both interpretations is not permitted either. If L2 speakers had knowledge of the OPC, they would not allow a bound interpretation as well as both interpretations in Type 1, but they would not have this restriction in the other types of sentence. This is why the differences in bound/both interpretations for each sentence type are compared in Figure 3.

Figure 4 below shows the results of Type 1 across groups, which contain the quantified DPs with the overt subject pronouns. The highest percentage is a disjoint response in the English L2 groups and the Korean control group. All groups prefer a disjoint reading in this sentence type. The Korean controls have performed in accordance with the OPC (97.5% of the controls have accepted a disjoint reading only) since they categorically disallow co-reference between the overt subject pronoun and the QDP/*wh*-word matrix

subject. The graph shows an exclusive choice of the disjoint reading by a large percentage of the L2 learners.

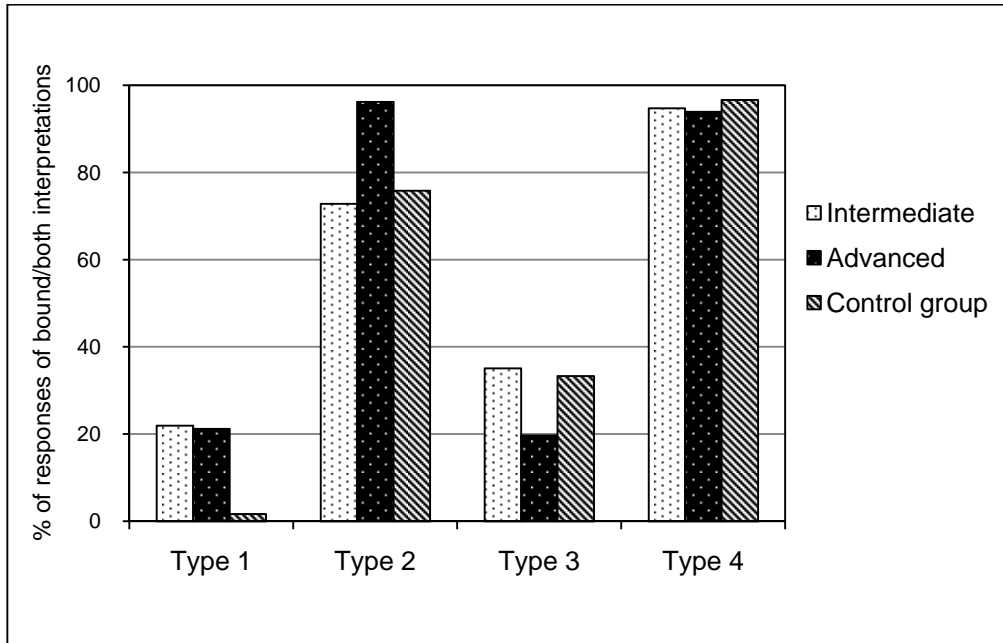


Figure 3: The results of Type 1 to Type 4 in the comprehension task

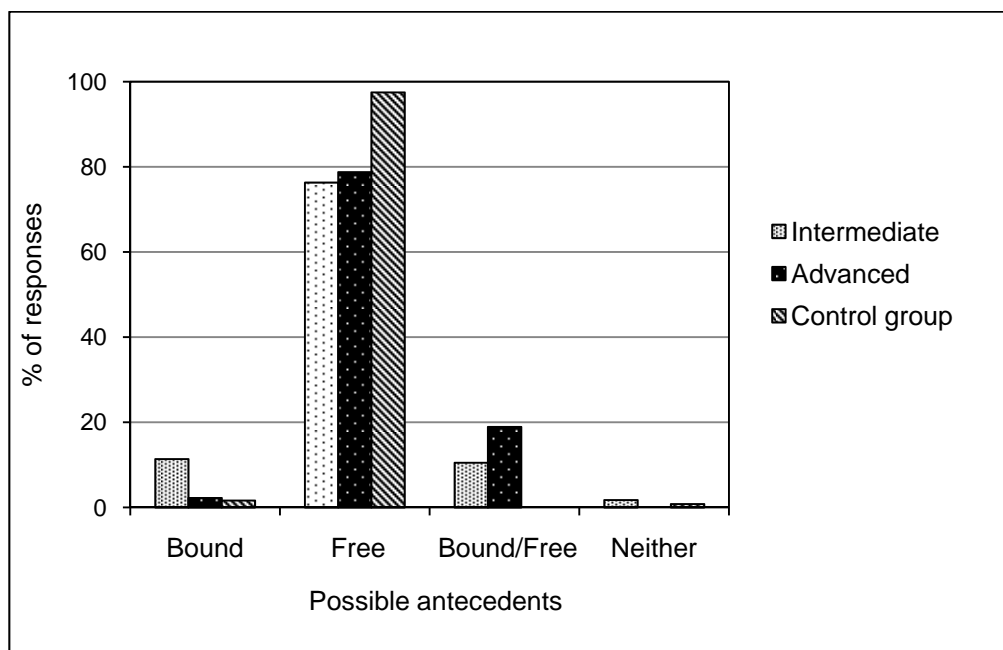


Figure 4: The results of Type 1 (QDP/overt subject) in the comprehension task

Both L2 groups manifest a similar pattern; 76.32% of the intermediate learners and 78.79% of the advanced learners chose the disjoint reading only option. However, the rate is not as high as that of the Korean control group. A one-way ANOVA with a post-hoc Tukey HSD was conducted to see whether there is a significant contrast between groups in the selection of the disjoint reading only in Type 1. A significant contrast is shown for the across-group comparison ($F(2, 58)=5.020, p<0.05$). It reveals a highly significant effect between the L2 intermediate group and the Korean native group ($p<0.05$) and between the L2 advanced group and the Korean native group ($p<0.05$). However, no significant difference is found between the two L2 groups ($p=0.938$). This implies that the two L2 groups behave similarly regarding their preference for the disjoint reading in Type 1, although their performance is not like that of the Korean control group. The scores of the disjoint reading by the intermediate group are considerably high and this is comparable with the scores of the disjoint reading by the advanced group. The advanced group seems to perform slightly better than that of the intermediate group since the former allows the bound reading 2.27% of the time (compared to 11.4% by the intermediate group). However, the advanced group shows a slightly higher rate of ‘both bound/disjoint’ readings than the intermediate one (the former 18.94% of the time and the latter 10.53% of the time), contrary to our expectation. Approximately 21% of the L2 learners in each group do not reject bound or both readings that are not permissible in Type 1. The advanced group does not appear to demonstrate any further development, even though the exposure to Korean has been increased.

Regarding Type 2 (QDP+null subject) sentences, the correct answer for this sentence type is an ‘either bound or disjoint’ interpretation. The advanced group selected more the option of both bound/disjoint readings (61.36%) than the intermediate group (35.09%). Interestingly, the results of the L2 learners in Type 2, whereby the option of both bound/disjoint readings is grammatical, are different from those of the Korean natives. The Korean natives chose a bound interpretation only in 65.83% of the responses, followed by a disjoint reading only 23.34% of the time. They accepted the option of both readings at just 10%. Contrary to the native controls, the L2 groups responded with a more ‘expected’ answer (i.e. an option for both bound/disjoint readings) in Type 2. Although the option for both interpretations is expected to be

available in this type, the high percentage of the bound interpretation by the Korean natives is not surprising. This is because when the coherent discourse cue is not provided, the sentence-internal antecedent for the null pronoun is largely favoured (see Grimshaw & Rosen 1990). The Korean null pronoun is equivalent to the unstressed pronoun in English; the use of null pronouns has been largely regulated by provided discourse contexts. Despite the co-reference interpretation not being obligatory, the interpretation of the null form seems to mainly depend on the availability of semantic/discourse interpretations. Furthermore, this phenomenon is also confirmed with previous OPC research such as Kanno (1997, 1998), Marsden (1998, 2002a), Rothman & Iverson (2007a, b) and Rothman (2009) (see Table 17). Although the comprehension task in this study was designed to improve the rates of the ‘both’ response, it was not successful. The native controls might feel that they should make a decision of one or the other. They may become familiar with making a choice of one being correct and the other being incorrect. This might explain the infrequency of the ‘both bound/disjoint readings’ response.

Having considered the results regarding Type 1 and Type 2 sentences, we can now see how the L2 learners clearly do not treat Type 1 and Type 2 in the same way. All the groups accept a bound reading or both readings in Type 2, whereas these options have been rejected in Type 1. If the OPC is operative in the L2 learners, they should not accept a bound interpretation in Type 1. As a percentage, it seems that L2 learners clearly differentiate between Type 1 and Type 2 in the selection of bound or both bound/disjoint readings. In order to check whether there is a clear distinction in the patterns of responses between Type 1 and Type 2 sentences within each group, a paired-sample *t*-test was conducted. As can be seen in Table 16, each L2 group and the Korean control group show a significant difference for the bound/both readings between Type 1 and Type 2 ($p < 0.05$). Therefore, this result reveals sensitivity to the OPC for the L2 learners as well as for the native speakers of Korean.

Table 16: The results of *t*-test on the selection for bound/both readings within each group in the comprehension task (Type 1 vs. Type 2, Type 1 vs. Type 3)

Group	Type 1 vs. Type 2		Type 1 vs. Type 3	
	<i>t</i>	<i>p</i>	<i>t</i>	<i>p</i>
L2 intermediate (n=19)	-6.722	0.000	0.623	0.538
L2 advanced (n=22)	-11.885	0.000	1.685	0.103
Korean controls (n=20)	-20.033	0.000	-3.943	0.001

However, the case of Type 3 (RDP+overt subject) is different from that of Type 2; there is a strong preference for the disjoint interpretation by the two L2 groups and the Korean control group, even though either a bound or disjoint reading is available. In Type 3 sentences, the overt embedded subject pronoun can co-refer with a referential matrix subject, contrary to Type 1 sentences (QDP+overt subject); in addition, the overt subject pronoun can have a disjoint reading. All the groups chose both bound/disjoint readings in approximately 10% of the responses. Indeed, the selection of the disjoint reading in Type 3 is the most salient interpretation in Korean because the embedded overt pronoun is mostly found in a stressed function. The usage of the embedded overt subject pronoun in Korean is not preferred as a co-referential bound interpretation (Han 2006). A referring expression, such as a person's name that is previously mentioned (or a reflexive pronoun *caki*), occurs for the bound variable interpretation where the third person pronoun is appropriate in English. As briefly discussed in Chapter 3, according to Kang (1988), the use of the overt pronoun in Korean is not the preferred option since this kind of pronoun is a recent development in Korean grammar. Interestingly enough, the preference of the disjoint reading in this sentence type can be seen in the native speakers of Japanese (e.g. Marsden 1998, 2002a) as well as in the native speakers of Spanish (e.g. Rothman 2007a, b; Rothman 2009) (see Table 17).

As shown in Table 16 above, the statistical analysis between Type 1 and Type 3 shows no significant effect in the selection of bound/both readings by all the L2 groups (L2 intermediate: $p=0.538$, L2 advanced: $p=0.103$). However, the Korean control group yields a significant difference for the bound/both readings between Type 1 and Type 3 ($p<0.05$) because this group has categorically rejected the bound/both interpretations in Type 1. Let us remember that the reason for testing Type 3 is to investigate whether the

L2 learners show a different interpretation of the overt pronoun in the QDP and the RDP contexts. The results demonstrate that although Korean controls interpret the overt subject pronoun in Type 1 and Type 3 structures differently, this is not the case for both L2 groups.

In Type 4 sentences (RDP+null subject), there is a very strong preference for bound or both interpretations. A referential DP in the matrix subject position is a preferred antecedent (bound reading) by the L2 groups at 52.85%, and then it is followed by both bound/disjoint readings in 41.46% of the responses. For the native speakers of Korean, there is a very strong preference for the bound reading in Type 4; the sentence-internal antecedent (RDP matrix subject) is selected as an antecedent 90% of the time. In contrast to Type 3, this pattern has also been observed in Type 2, where the null pronoun tends to find its antecedent within the same sentence. The Korean controls exhibit a low rate of the acceptance of both readings, which has been similarly shown in Type 3. They have preferred one particular reading in each sentence type and they have hardly selected both readings.

Table 17 shows a comparison of the acceptance rates in the comprehension task regarding bound or both (bound/disjoint) readings by native controls in established OPC studies. It can be seen that all the studies show a similar performance across different sentence types. For instance, the native controls rejected a bound reading exclusively in Type 1. Such a high rate of the categorical selection of the disjoint reading only in Type 1 can be seen as a reflection of the OPC effects. Any of the other sentence types (e.g. Type 2, 3, and 4) can be interpreted either a bound or disjoint reading. In Type 2, the native control groups showed a preference of the bound reading. Hence, we can see a clear distinction between Type 1 and Type 2 in terms of the permissibility with a QDP as an antecedent. All the studies showed more or less bound or both readings on RDP sentences with overt pronouns (Type 3), which are not permitted for QDP sentences with overt pronouns (Type 1). Furthermore, they derived a strong selection of the bound or both readings in Type 4.

Table 17: The comparisons of acceptance rates of bound or both readings across different sentence types by native controls in previous OPC studies

Study		Type 1 (QDP/overt)	Type 2 (QDP/null)	Type 3 (RDP/overt)	Type 4 (RDP/null)
		%	%	%	%
Current study Korean controls		2.5 ⁸¹	75.83	33.33	96.67
Kanno (1997) Japanese controls		2.0	83.0	47.0	100
Kanno(1998) Japanese controls	Session 1	1.5	85.0	46.5	not tested
	Session 2	0	75.0	57.0	not tested
Marsden (2002a) Japanese controls		3.4	96.5	11.5	not tested
Rothman & Iverson (2007a) Spanish controls		7.0	75.0	36.6	80.0
Rothman & Iverson (2007b) Spanish controls		9.0	76.5	39.0	not tested
Rothman (2009) Spanish controls		5.3	89.3	35.3	87.3

As observed in the group results of the current study, the L2 participants have shown an exclusive acceptance for the disjoint reading and the rejection for the bound reading in Type 1. Both L2 groups and the Korean control group have made a statistical distinction between Type 1 and Type 2 in the selection of the disjoint interpretation. As for the comparison between Type 1 and Type 3, the Korean control group makes a contrast, whereas the L2 groups do not. These results entail that, even though the two L2 groups demonstrate knowledge of the OPC, their interlanguage grammar is not completely nativelike.

5.6.1.2 Group results of Type 5 to Type 8

Table 18 below shows the group results, when the matrix clause subject is a QDP/*wh*-phrase or a RDP and the pronoun is in object position. Type 5 is a main test sentence

⁸¹ This percentage involves an ungrammatical reading for Type 1 such as ‘a bound reading’, ‘both bound/disjoint readings’, and ‘neither’.

type of the OPC as this sentence type contains quantified or *wh*-phrase matrix subjects with embedded overt object pronouns.

Table 18: Acceptance rates of overt and null forms in embedded object position with QDP and RDP contexts (Type 5 to Type 8)

Type of sentences	Option	L2 intermediate (n=19)		L2 advanced (n=22)		Korean controls (n=20)	
		no.	%	no.	%	no.	%
Type 5 (QDP + overt object, n=6)	bound	7	6.14	2	1.52	3	2.50
	disjoint	85	74.56	99	75.00	115	95.83
	both	19	16.67	31	23.48	2	1.67
	neither	3	2.63	0	0	0	0
Type 6 (QDP + null object, n=6)	bound	25	21.93	23	17.42	30	25.00
	disjoint	39	34.21	33	25.00	72	60.00
	both	50	43.86	76	57.58	18	15.00
	neither	0	0	0	0	0	0
Type 7 (RDP + overt object, n=3)	bound	17	29.83	5	7.58	24	40.00
	disjoint	26	45.61	43	65.15	27	45.00
	both	14	24.56	18	27.27	9	15.00
	neither	0	0	0	0	0	0
Type 8 (RDP + null object, n=3)	bound	28	49.12	13	19.70	48	80.00
	disjoint	10	17.55	3	4.54	6	10.00
	both	19	33.33	50	75.76	6	10.00
	neither	0	0	0	0	0	0

Note: The shaded cells indicate expected target responses in each sentence type.

Figure 5 shows the percentages of the bound/both interpretations across groups from Type 5 to Type 8. The results of Type 5 are compatible with those of Type 1. All groups prefer a disjoint antecedent for the overt object pronoun. The Korean control group categorically rejects a bound reading in the OPC sentences and this suggests that the OPC in object position is operative in the grammar of native Korean speakers. Each L2 group demonstrates a similar rate of the disjoint reading between the embedded overt object pronoun and the quantified matrix subject. As can be seen, 74.56% of the intermediate learners, 75% of the advanced learners, and 95.83% of the Korean controls have accepted a disjoint response only. Although the rate of the two L2 groups' rejection of the bound and both readings (intermediate: 22.81%, advanced: 25%) is not as high as that of the Korean control group (4.17%), as shown in Figure 6, the L2

learners' responses can be seen as a reflection of linguistic knowledge, the OPC, rather than a general preference for the disjoint reading. This is because the rate of the rejection of the bound/both readings by the L2 groups is only observed in Type 5, not in the other types of sentence.

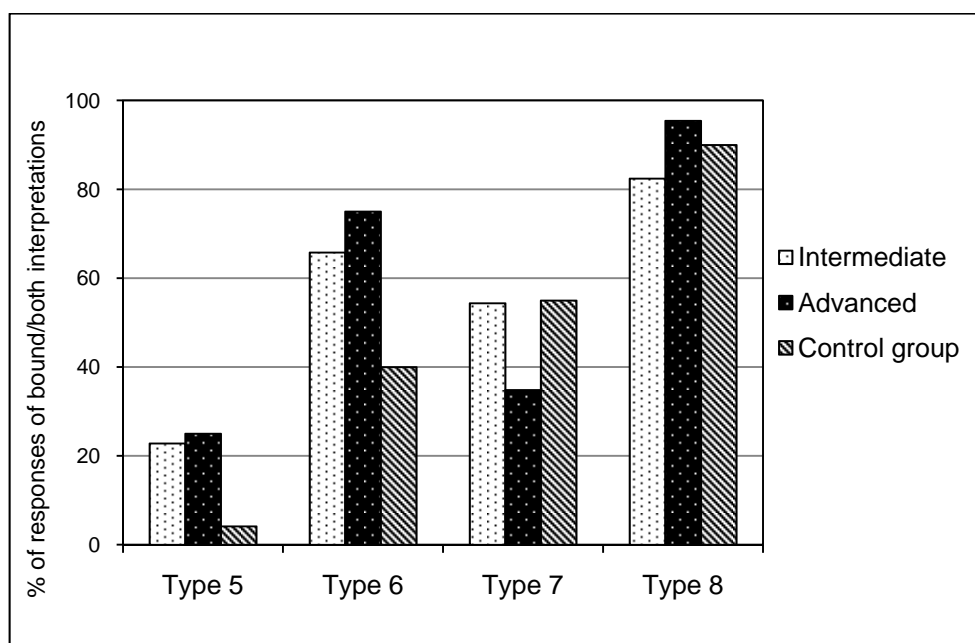


Figure 5: The results of Type 5 to Type 8 in the comprehension task

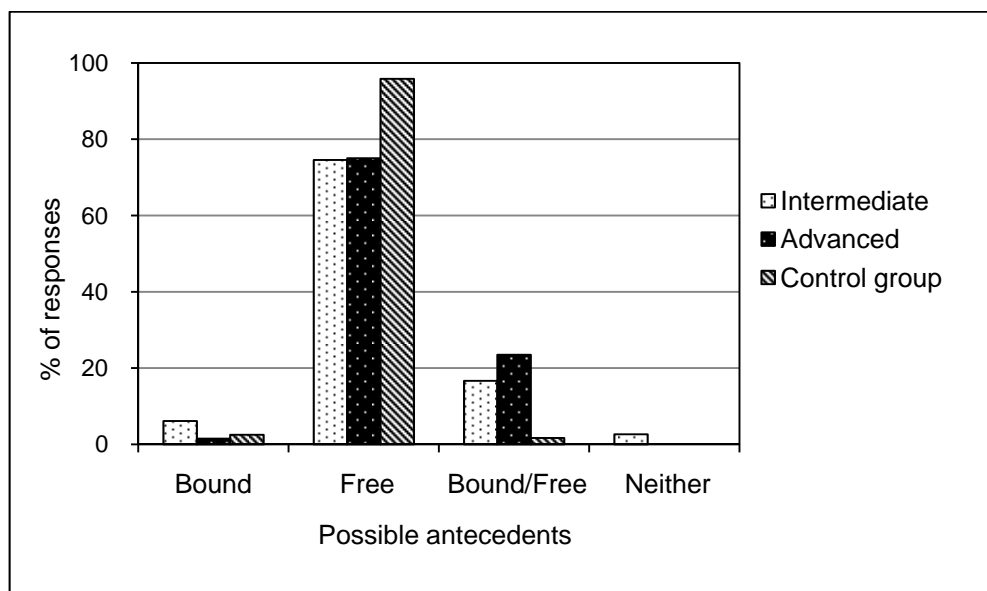


Figure 6: The results of Type 5 (QDP/over object) in the comprehension task

A one-way ANOVA was run to see whether there is a significant difference in choosing a response of the disjoint reading among the experimental groups. A significant contrast has been shown for the across-group comparison in the selection of the disjoint reading in Type 5 ($F(2, 58)=10.714, p<0.05$). Furthermore, a post-hoc Tukey HSD comparison reveals a significant difference between the L2 intermediate group and the Korean control group ($p<0.05$) and between the L2 advanced group and the control group ($p<0.05$). However, no significant effect has been found between the intermediate and the advanced groups ($p=0.996$), as in the case of Type 1 (QDP+overt subject) structures. These statistical results indicate that the L2 learners' performance in Type 5 is different from that of the Korean natives, despite the fact that they show a high percentage of acceptance of sentences with a null pronoun (the correct option).

The result of Type 6 (QDP+null object) sentences is also similar to that of Type 2 (QDP+null subject) in the option of 'both bound/disjoint' readings, which is the correct response. The two L2 groups select bound or both readings in a relatively high rate of responses (intermediate: 65.79%, advanced: 75%) in this context, which are options that are rejected in Type 5 structures. In contrast, the Korean controls only choose both readings 15% of the time, which is similar to those of Type 2. They have a preference for the disjoint reading in Type 6 in 60% of the responses, contrary to the results of Type 2. In order to check whether there is a significant difference in the selection of the bound/both interpretations between Type 5 and Type 6 structures, a paired-sample *t*-test was carried out.

Table 19: The results of *t*-test on the selection for bound/both readings within each group in the comprehension task (Type 5 vs. Type 6, Type 5 vs. Type 7)

Group	Type 5 vs. Type 6		Type 5 vs. Type 7	
	<i>t</i>	<i>p</i>	<i>t</i>	<i>p</i>
L2 intermediate (n=19)	-5.646	0.000	-0.982	0.333
L2 advanced (n=22)	-7.878	0.000	1.278	0.208
Korean controls (n=20)	-6.028	0.000	-4.410	0.000

As Table 19 shows, both L2 groups and the Korean control group show a significant difference regarding the bound/both interpretations between Type 5 and Type 6 structures ($p < 0.05$). These results show an obvious sensitivity to the OPC in the case of L2 learners as well as for the Korean natives. In consequence, they demonstrate that all groups distinguish between overt and null objects when the matrix subject is a QDP/*wh*-word.

Next are the results for Type 7 (RDP+overt object) structures, which contain a referential DP with overt object pronouns. While a significant difference is observed for the Korean control group ($p < 0.05$) in the selection of bound/both readings between Type 5 and Type 7, no significant effect is observed by either of the L2 groups (L2 intermediate: $p = 0.333$, L2 advanced: $p = 0.208$). The case of Type 7 (RDP+overt object) is also comparable to Type 3 (RDP+overt subject) because the statistical analysis between Type 5 and Type 7 has shown no significant effect by the two L2 groups, whereas a significant difference is found for the Korean control group. Again, the performance of the OPC in object position between the L2 groups and the Korean control group differs significantly, despite the L2 speakers having shown that they know the restrictions arising from the OPC.

The data regarding Type 8 (RDP+null object) sentences are similar to those in relation to Type 4 (RDP+null subject), as learners show a preference for bound/both interpretations with both structures. Recall that the motivation for involving the RDP contexts in the test battery was to observe whether taking an antecedent outside the sentence in the QDP contexts is due to preference, rather than rejection of the ungrammatical bound interpretation. The participants may have a preference for the sentence external antecedents in the use of the overt pronoun.

As has been observed in the group results above, the L2 learners have shown an exclusive acceptance for the disjoint reading and a rejection of the bound reading in Type 1 and Type 5. The L2 learners and the Korean controls have made a statistical distinction between Type 1 and Type 2 and between Type 5 and Type 6 in accepting the bound interpretation. I have also observed the results of Type 3 and Type 7, which contain a referential DP with the overt pronoun.

If L2 participants reject the bound reading in Type 1 and Type 5 and they allow a bound reading or both bound/disjoint readings in Type 3 and Type 7, this study expects that their performance would indicate a significant difference. However, the statistical analysis between Type 1 and Type 3 and between Type 5 and Type 7 shows no significant effect by all the L2 groups ($p>0.05$). Instead, a significant difference has been shown by the Korean control group ($p<0.05$) (see Tables 16 and 19). This result is not expected from the prediction. Let us remember that the performance by the L2 speakers was not identical to that of the Korean controls in Type 1; however, the Korean natives showed a sharp contrast between the disjoint reading and the bound reading in this sentence type. Furthermore, the statistical performance between the L2 groups and the Korean control group was different significantly. The L2 learners have allowed a bound reading more or less 20% of the time in Type 1. This percentage is not very different from that of Type 3. I have failed to observe the difference between Type 1 and Type 3 by the L2 groups. Their acceptance pattern of possible antecedents in Type 1 and Type 3 is similar to each other. The case of Type 7 is also compatible with Type 3; but the Korean controls tend to choose the bound reading more than the L2 groups. Overall, the statistical comparison between Type 1 and Type 3 and between Type 5 and Type 7 further confirms that the L2 learners' performance is not like native Korean speakers.

To sum up, the group results have shown that the L2 learners possess relevant knowledge of the OPC at both proficiency levels (intermediate and advanced) and for both types of pronouns (subject and object). I have analysed the OPC effect in Type 1 (QDP+overt subject) and Type 5 (QDP+overt object), and the significant difference between Type 1 (QDP+overt subject) and Type 2 (QDP+null subject) and between Type 5 (QDP+overt object) and Type 6 (QDP+null object). These findings clearly suggest that the L2 speakers appear to have the OPC operative in their interlanguage grammar.

The table 20 below shows how the L2 speakers behave in the three different quantifiers in QDP contexts.⁸² Regarding Type 1 sentences, it seems that there is not much variation in the OPC effect in accordance with the different types of QDPs. However, the quantifier *nwukwunka* ‘someone’ shows the highest violation rates of the OPC for each group, when the pronoun is in object position. 36.84% of the intermediate learners, 43.18% of the advanced learners, and 10% of the Korean controls show the OPC violation in Type 5 sentences, when the QDP is *nwukwunka* ‘someone’. Since this phenomenon is not found in Type 1 sentences, this study assumes that the OPC violation with *nwukwunka* ‘someone’ may be ascribed to the position of pronoun. The quantifier *nwukwunka* ‘someone’ may perhaps not be a representative quantifier for the OPC contexts in this task. Indeed, for Lozano (2003), ‘core’ quantifiers such as ‘each’ and ‘nobody’ were selected by native speakers of Spanish and then these selected quantifiers were used in the task. Yet a possible explanation for the non-instantiation of the OPC effect regarding different quantifiers in Korean is still unclear.

Table 20: OPC violations in three different QDPs/*wh*-words

different quantifiers	L2 intermediate (n=19)		L2 advanced (n=22)		Korean controls (n=20)	
	Type 1 (%)	Type 5 (%)	Type 1 (%)	Type 5 (%)	Type 1 (%)	Type 5 (%)
<i>nwukwunka</i> ‘someone’	21.05	36.84	18.18	43.18	2.5	10
<i>nwukwuna</i> ‘everyone’	28.95	15.79	18.18	9.09	0	0
<i>nwukwu</i> ‘who’	21.05	23.68	27.27	22.73	5	2.5

5.6.2 Individual results

Now let us turn to the individual results in order to examine a possible systematic variation among the participants within each group. First, the present study examines

⁸² According to Marsden’s (1998) result in terms of the investigation of the different types of quantifiers, L2 learners more violated the OPC when the QDP was ‘everyone’. The author argues that the possible reason for the OPC violation in the ‘everyone’ sentences is due to the use of the overt pronoun ‘they’ rather than ‘he’. In the ‘who’ and ‘someone’ sentences, the author used the overt pronoun, ‘he’. She points out that the 3rd plural pronoun ‘they’ may have led the participants to prefer a sentence-internal antecedent.

the consistency of the participants in selecting the expected correct interpretation (i.e. disjoint) in Type 1 and Type 5 sentences. The consistency data presents the number of participants in each group who chose only the disjoint reading for at least five out of the six tokens in OPC contexts, as shown in the following table.

Table 21: Consistency rates with which a disjoint reading only was selected at least five out of six tokens in Type 1 and Type 5 sentences

Group	Type 1 (QDP + overt subject)		Type 5 (QDP + overt object)	
	no.	%	no.	%
Korean controls (n=20)	20	100	20	100
L2 advanced (n=22)	15	68.19	11	50
L2 intermediate (n=19)	12	63.13	10	52.64

The data show that the Korean controls categorically reject a bound reading or bound/both readings in both sentence types. In contrast, the two L2 groups clearly exhibit a different distribution. For the L2 groups, there is no progressive acquisition pattern in the response for the disjoint reading only in Type 1 (QDP+overt subject) and Type 5 (QDP+overt object) and their consistency rates are not as high as those of the Korean controls, which is somewhat consistent with the group data presented in Tables 15 and 18. Interestingly, a different performance between Type 1 and Type 5 for the L2 learners has been shown, in contrast to the previous group results. The consistency of the data demonstrates quite low rates in the selection of the correct option for Type 5 sentences for both proficiency groups, which suggests that, in contrast to the previous group results, a significant number of learners may not have a targetlike syntactic representation of the OPC.

This study has further observed L2 groups individually in order to see whether they show a distinct behaviour according to the different groups. Without a full investigation of the individual results, it would be difficult to explore a more complete picture of the OPC effects between learners.

The following table shows the number of participants who allowed a bound reading in Type 1 and Type 5 structures, an option which is not permitted in Korean. 85% and 75% of the native Korean speakers completely rejected a bound reading in these structures, as shown in Table 22. For Type 1 sentences (QDP+overt subject) 3 native speakers accepted 1 ungrammatical reading; for Type 5 sentences (QDP+overt object) 5 natives accepted 1 ungrammatical bound reading.⁸³ Crucially, none of the Korean natives accepted the ungrammatical bound reading more than once. In contrast, the L2 intermediate and the L2 advanced learners show a different behaviour from the native Korean controls (see Tables 23 and 24).

Table 22: The number of times that a bound reading was selected in Type 1 and Type 5 by native speakers of Korean (n=20)

no. of times bound reading selected	Type 1 (QDP + overt subject, n=6)		Type 5 (QDP + overt object, n=6)	
	no. of subjects	%	no. of subjects	%
0	17	85	15	75
1	3	15	5	25
2	0	0	0	0
3	0	0	0	0
4	0	0	0	0
5	0	0	0	0
6	0	0	0	0
Total	20	100	20	100

In Table 23, 36.84% of the intermediate learners have completely rejected a bound interpretation in Type 1. Furthermore, only 26.32% of the intermediate learners reject a bound interpretation for the overt object pronoun in Type 5. Based on these individual results, it can be seen that there is a substantial amount of individual variation with respect to the selection of the correct choice.

⁸³ Among the 3 native Korean speakers who responded a bound or both interpretations in Type 1, 2 native speakers violated the OPC when the matrix subject was ‘who’ and ‘someone’ respectively and 1 native speaker responded ‘neither’. As for Type 5, 4 native Korean controls violated the OPC when the matrix subject was ‘someone’ and 1 control also did when the matrix subject was ‘who’.

Table 23: The number of times that a bound reading was selected in Type 1 and Type 5
by intermediate learners (n=19)

no. of times bound reading selected	Type 1 (QDP + overt subject, n=6)		Type 5 (QDP + overt object, n=6)	
	no. of subjects	%	no. of subjects	%
0	7	36.84	5	26.32
1	5	26.32	5	26.32
2	2	10.53	3	15.79
3	4	21.05	6	31.58
4	0	0	0	0
5	0	0	0	0
6	1	5.26	0	0
Total	19	100	19	100

From Table 24, 54.55% of the advanced learners do not permit a QDP/*wh*-word as an antecedent for the overt subject pronoun. Compared to the individual results for the intermediate learners regarding a complete rejection of the bound variable reading, we can see a gradual improvement on the acceptance of the disjoint reading in Type 1 as the L2 learners' proficiency of Korean develops. Interestingly, this observation between the advanced and the intermediate learners was not captured by the group results in Table 15 as well as the consistency rates in Table 21.

Table 24: The number of times that a bound reading was selected in Type 1 and Type 5
by advanced learners (n=22)

no. of times bound reading selected	Type 1 (QDP + overt subject, n=6)		Type 5 (QDP + overt object, n=6)	
	no. of subjects	%	no. of subjects	%
0	12	54.55	5	22.73
1	3	13.64	6	27.27
2	1	4.55	7	31.82
3	2	9.09	3	13.64
4	3	13.64	1	4.55
5	1	4.55	0	0
6	0	0	0	0
Total	22	100	22	100

As for Type 5 sentences, only 22.73% of the advanced learners have entirely rejected a bound interpretation. This rate (22.73%) is even lower than the rate of the intermediate learners (26.32%); we cannot, therefore, see any improvement in the rates regarding Type 5 sentences as their proficiency increases. The finding of the overt object pronoun constraint in which shows no development across the proficiency levels is parallel to the group data and the consistency data presented in Tables 18 and 21, respectively.

It is important to note that, given that even a non-trivial number of the Korean native speakers accepted the ungrammatical reading at least once, the nativelike L2 group should include all those learners who accept it once. As can be seen in Tables 23 and 24, 63.16% and 52.64% of the intermediate learners and 68.19% and 50% of the advanced learners can be handled as having nativelike knowledge of the OPC effect in Type 1 and Type 5, respectively. These rates are compatible with the L2 speakers' consistency rates as shown in Table 21.

5.6.3 Summary of the comprehension task data

To summarise, the individual data reveal great variability among the L2 participants regarding knowledge of the OPC in subject and object positions, compared to the Korean natives. In the group results, the L2 learners show OPC effects in their grammar (though their performance is not exactly like the native controls). However, the scores of the individual data are interesting as the individual data provide learner variation that cannot be observed by the group data (note that the difference of both L2 groups was not significant as a group).

Looking at the individual data, an apparent development in the rate of acceptance on the disjoint interpretation can be observed in Type 1, but not in Type 5. In other words, the advanced learners perform better than the intermediate learners in Type 1; however, the advanced learners show a depressed acquisition pattern in Type 5. The L2 speakers in both levels distinguish Type 1 from Type 5; it seems that some of the learners more violate the OPC when the pronoun is in object position than when it is in subject position.

5.7 Results of the story-based translation task

This section provides results of a descriptive and a statistical analysis of the story-based translation task. This study requires two types of analyses: i) a within-group comparison and ii) an across-group comparison. For the within-group comparison, a paired-sample *t*-test was performed to verify significance between grammatical null pronouns vs. ungrammatical overt pronouns in each sentence type (e.g. Type 1 and Type 3). For the latter analysis, a one-way ANOVA with a post-hoc Tukey HSD comparison was conducted. Note that all four types of the test sentences in the translation task are different from the eight types of the test sentences in the comprehension task.

5.7.1 Group results

Table 25 below presents the percentage of the overall results of the translation task by two L2 groups and a Korean control group.

Table 25: Percentages of responses across sentence types by experimental groups in the translation task

Sentence types		Response	L2 inter. (n=19)		L2 advanced (n=22)		Korean controls (n=20)	
			no.	%	no.	%	no.	%
subject pronoun	Type 1: bound reading (n=4)	overt	8	10.53	4	4.55	0	0
		null	68	89.47	80	90.90	78	97.50
		both	0	0	0	0	2	2.50
		<i>caki</i>	0	0	4	4.55	0	0
	Type 2: disjoint reading (n=4)	overt	64	84.21	68	77.27	78	97.50
		null	12	15.79	20	22.73	0	0
		both	0	0	0	0	2	2.50
		<i>caki</i>	0	0	0	0	0	0
object pronoun	Type 3: bound reading (n=4)	overt	17	22.37	11	12.50	2	2.50
		null	59	77.63	61	69.32	71	88.75
		both	0	0	0	0	0	0
		<i>caki</i>	0	0	16	18.18	7	8.75
	Type 4: disjoint reading (n=4)	overt	46	60.53	62	70.45	66	82.50
		null	30	39.47	26	29.55	3	3.75
		both	0	0	0	0	10	12.50
		<i>caki</i>	0	0	0	0	1	1.25

Type 1 (bound reading for a subject pronoun with a QDP matrix subject) and Type 3 (bound reading for an object pronoun with a QDP matrix subject) are the main sentence types for the assessment of the OPC. The instantiation of the OPC is tested by whether L2 speakers produce embedded subject or object pronouns (null vs. overt) in the translation of OPC-related sentences. The Korean translation for the English overt pronoun in these sentence types should be null. It should be noted that even though the production of the null pronoun is the most salient answer in Type 1 and Type 3 sentences, a reflexive pronoun *caki* is also possible in place of a null pronoun. Table 25 shows the percentage of each response that the experimental groups produced in the task. It is worth mentioning that, in Table 25, the response pattern ‘both’ is not available in L2 speakers. This is why all the L2 speakers show 0% of the time in the option of ‘both’. As briefly mentioned in Section 5.4.2, the Korean controls had to take a modified version of the task since the task involved a translation. In this modified version of the task for the Korean control group, it was possible to choose ‘both null/overt pronouns’. Table 26 displays the overall rates of the target responses involving a null pronoun or a reflexive pronoun (e.g. *caki*) in Type 1 and Type 3 sentences.

Table 26: Percentages of the correct responses (null pronoun or *caki*) by experimental groups in Type 1 and Type 3 in the translation task

Group	Type 1 (bound reading for a subject pronoun)		Type 3 (bound reading for an object pronoun)	
	no.	%	no.	%
Korean controls (n=20)	78	97.50	78	97.50
L2 advanced (n=22)	84	95.45	77	87.50
L2 intermediate (n=19)	68	89.47	59	77.63

The following graph shows the percentages of the null pronoun or *caki* across groups for different sentence types. As shown in Figure 7, the rates of the correct responses in Type 1 and Type 3 sentences are notably higher than the ones from the comprehension task in all the experimental groups.

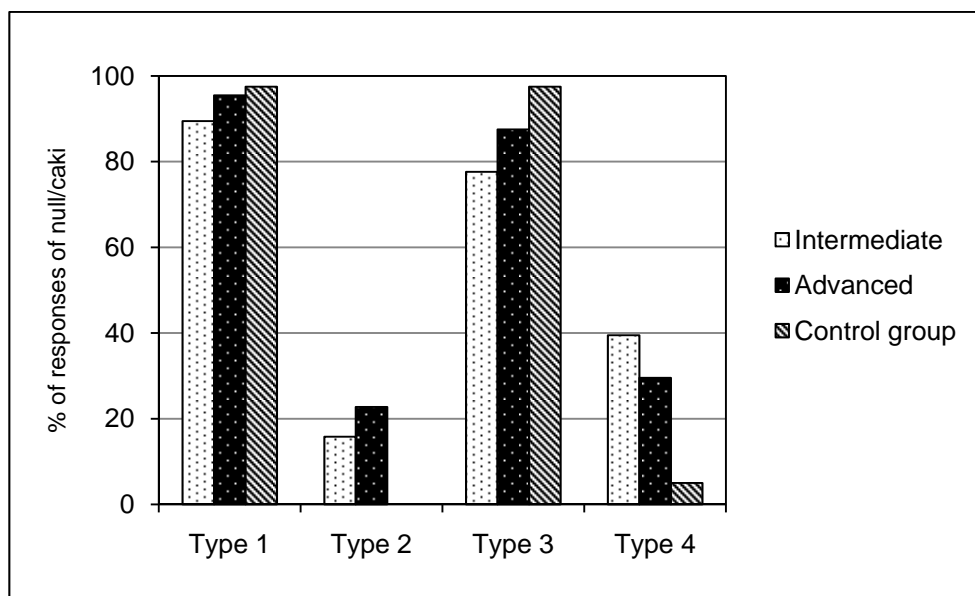


Figure 7: The rates for the use of null/*caki* across sentence types in the translation task

5.7.1.1 Results of Type 1 and Type 2

The Korean controls performed in accordance with our expectation in that they have the OPC structure in their grammar. They treat overt and null pronouns differently, depending on what interpretation is favoured by the story. The Korean controls used a null pronoun 97.5% of the time in Type 1 (bound reading for a subject pronoun with a QDP matrix subject), whereas they used an overt subject pronoun only 2.5% of the time. Conversely, these Korean natives responded with overt subject pronouns at a rate of 97.5% in Type 2, where a discourse-based disjoint reading is favoured by the story and the matrix subject is a QDP.

For Type 1 sentences, only 4.55% of the advanced learners and 10.53% of the intermediate learners used an overt subject pronoun, which is not permitted in Type 1 where the matrix subject is a QDP and the bound reading is favoured by the context. The scores of the intermediate learners regarding the production of the overt embedded subject pronoun replicate the results of Pérez -Leroux & Glass (1999) and Rothman & Iverson (2007b). In addition to this, the intermediate and the advanced groups produce a null subject strongly 89.47% and 90.9% of the time respectively in this sentence type. The intermediate group and the advanced group seem to behave identically at first glance when we only see the percentage of the null pronoun response in Type 1.

Interestingly, only advanced learners produce a reflexive pronoun ‘*caki*’ 4.55% of the time in embedded clauses. The Korean reflexive pronoun ‘*caki*’ is a possible option along with a null pronoun in Type 1 (bound reading for a subject pronoun with a QDP matrix subject) and Type 3 (bound reading for an object pronoun with a QDP matrix subject). The reflexive pronoun in Korean is used interchangeably with a null pronoun in these cases. We can see a modest improvement from the intermediate group (89.47%) through the advanced group (95.45%) in producing a target translation (see Figure 8).

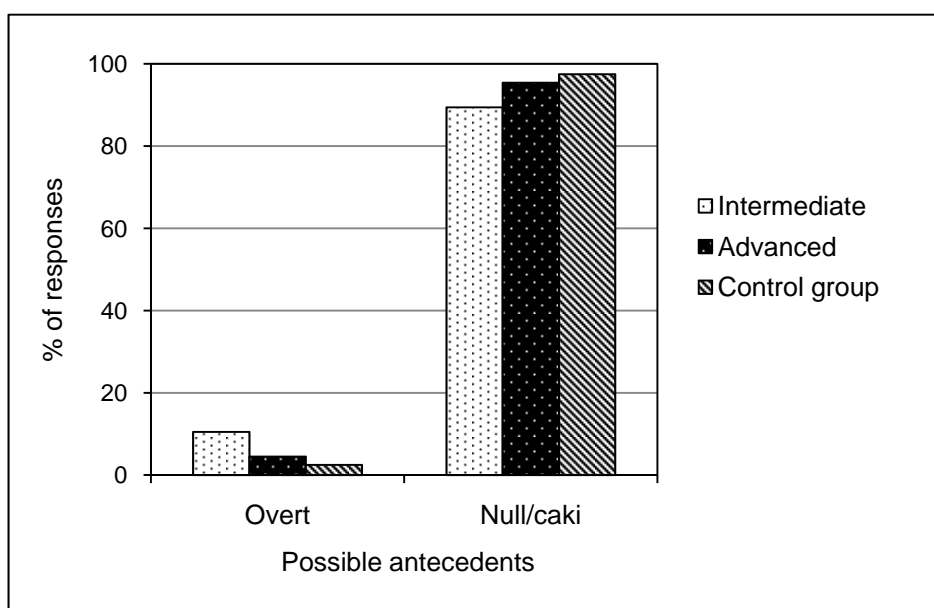


Figure 8: The rates for the use of overt and null/*caki* in Type 1 (bound reading for a subject pronoun with a QDP matrix subject) in the translation task

A one-way ANOVA reveals no significant difference between-group comparisons in the production of the null subject pronoun in Type 1 ($F(2, 58)=2.682, p=0.077$). Further post-hoc Tukey HSD shows no significance between the intermediate and the advanced groups ($p=0.214$), between the intermediate and the Korean control groups ($p=0.074$), and between the advanced and the Korean control groups ($p=0.826$). These results indicate that the three experimental groups present the grammatical null pronouns strongly in the OPC-related contexts to a similar extent. In other words, each group significantly prefers a grammatical null pronoun to an ungrammatical overt pronoun in Type 1 sentences; both L2 groups behave similarly to the Korean control group.

As for Type 2 sentences whereby the matrix subject is a QDP and the discourse-based disjoint interpretation is favoured by the story, 84.21% of the intermediate learners and 77.27% of the advanced learners produced overt subject pronouns (remember that all options are grammatical for Type 2). However, the graph shows a slight decrease in the use of the overt subject pronouns in this sentence type across the proficiency levels. The two L2 groups produce a null subject pronoun significantly less in Type 2 in contrast to Type 1. The L2 participants demonstrate sensitivity to the OPC in that they greatly prefer null subject pronouns in OPC-related contexts and their response pattern for Type 1 is clearly distinguished from that of Type 2 sentences.

Having observed the results regarding Type 1 and Type 2 sentences, we can see how the L2 learners clearly do not treat Type 1 and Type 2 in the same way. In order to confirm that there is a distinct difference in the patterns of responses between Type 1 and Type 2 sentences within each group, a paired-sample *t*-test was conducted. As can be seen in Table 27 below, the Korean control group displays a statistically significant distinction in producing the overt subject pronoun between Type 1 and Type 2 ($t(19) = -41.410$, $p < 0.05$). As is the case for the control group, the intermediate group and the advanced group clearly differentiate between contexts in their use of overt pronouns. The *t*-test reveals a highly significant effect on the within-group comparison between these two stories, Type 1 and Type 2 (intermediate: $t(18) = -10.500$, $p < 0.05$, advanced: $t(21) = -10.752$, $p < 0.05$).

Table 27: The within-group comparisons for production of the overt subject pronoun between Type 1 and Type 2 sentences in the translation task

Sentence types	L2 intermediate (n=19)			L2 advanced (n=22)			Korean control group (n=20)		
	<i>M</i>	<i>SD</i>	<i>t</i>	<i>M</i>	<i>SD</i>	<i>t</i>	<i>M</i>	<i>SD</i>	<i>t</i>
Type 1	0.42	0.61	$p=0.000$	0.18	0.40	$p=0.000$	0.10	0.31	$p=0.000$
Type 2	3.37	0.96		3.09	1.19		3.90	0.31	

5.7.1.2 Results of Type 3 and Type 4

The Korean control group used a null pronoun 88.75% of the time, when the embedded object pronoun is bound by the QDP matrix subject (Type 3). Furthermore, 8.75% of the controls used a reflexive pronoun *caki*, which is also a possible answer. While a total of 97.5% of the native speakers of Korean produced a target response in Type 3 (bound reading for an object pronoun with a QDP matrix subject), only 2.5% of the controls elicited an overt pronoun, which is not allowed in this sentence type.

Consequently, it is observed that the OPC in object position is operative for the native speakers of Korean, as is the case for the OPC in subject position.

Regarding Type 3 sentences, the intermediate group assigned a null pronoun 77.63% of the time, but used an overt pronoun at 22.37%. The graph in Figure 9 below shows the rate of responses for each group in Type 3.

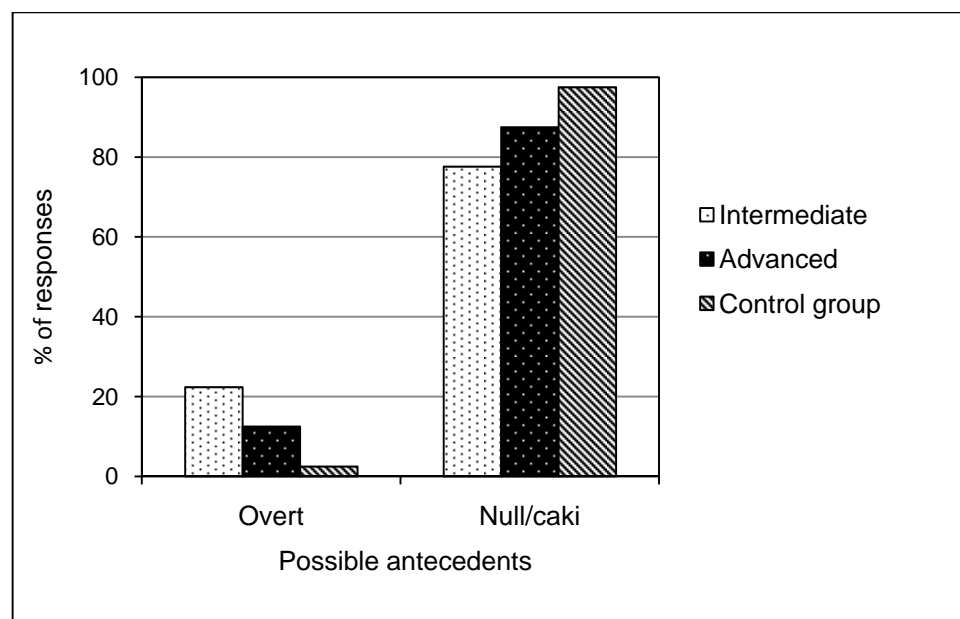


Figure 9: The rates for the use of overt and null/*caki* in Type 3 (bound reading for an object pronoun with a QDP matrix subject) in the translation task

The rates of null/*caki* pronouns, which are the accurate responses in Type 3, are much higher than the rates of overt pronouns. When comparing the Type 1 and Type 3 sentences, the intermediate group uses more grammatical null pronouns when the

pronoun is in subject position (Type 1) than in object position (Type 3). Conversely, they produced more ungrammatical overt pronouns in Type 3 (22.37%) than in Type 1 (10.53%), which suggests that the intermediate group performs better in Type 1 than in Type 3. Although this group has produced somewhat ungrammatical translation in Type 3, a high percentage of the learners have produced a target grammar in this sentence type. This result indicates that the intermediate learners may have the OPC instantiated in their grammars.

For the advanced group, the learners use null pronouns in 69.32% of the responses; this rate is lower than that of the intermediate level learners. The performance of the intermediate learners seems to be better than that of the advanced learners at this stage. However, the advanced group produces a reflexive pronoun '*caki*', instead of a null pronoun 18.18% of the time; whereas, the intermediate learners have not used this 'new' pronoun. Overall, 87.5% of the advanced learners have used a target pronoun; this rate is higher than the rate of the intermediate group (77.63%) (see Figure 9). The advanced group also shows a different behaviour between Type 1 and Type 3 sentences, like the intermediate group. That is, the accurate rates of responses in the advanced learners have decreased in Type 3, when compared with the percentage for Type 1.

A one-way ANOVA was run on the data in order to compare the three different groups. Recall that there was no significant effect for the across-group comparison in Type 1. In contrast to Type 1 sentences, a one-way ANOVA shows a significant effect for Type 3 ($F(2, 58)=3.791, p<0.05$). Further post-hoc Tukey HSD reveals that the intermediate group and the control group show a significant difference ($p<0.05$), whereas the intermediate and the advanced groups ($p=0.348$) and the advanced group and the control groups ($p=0.329$) do not show a significant difference. These statistical results indicate that the behaviour of the advanced group is consistent with the Korean control group in Type 3 sentences, but the performance of the intermediate group is not completely like that of the Korean control group in this sentence type.

Table 28 shows a within-group comparison on the production of the overt pronoun in Type 1 and Type 3 sentences. According to the *t*-test, the performance of each group is not significantly different from Type 1 and Type 3 sentences ($p>0.05$). This implies

that the L2 groups and the control group behave similarly between Type 1 and Type 3 in the translation task, regardless of their proficiency level.

Table 28: The within-group comparisons for production of the overt pronoun between Type 1 and Type 3 sentences in the translation task

Sentence types	L2 intermediate (n=19)			L2 advanced (n=22)			Korean control group (n=20)		
	<i>M</i>	<i>SD</i>	<i>t</i>	<i>M</i>	<i>SD</i>	<i>t</i>	<i>M</i>	<i>SD</i>	<i>t</i>
Type 1	0.42	0.61	-1.580	0.18	0.40	-1.670	0.10	0.31	0.000
Type 3	0.89	1.29	$p=0.132$	0.50	0.40	$p=0.110$	0.10	0.31	$p=1.000$

In Type 4 where the matrix subject is a QDP and the context-based disjoint interpretation is favoured for the object pronoun, 60.53% of the intermediate learners and 70.45% of the advanced learners construct a relatively high percentage of an overt pronoun than a null pronoun. All the groups have produced an overt pronoun for Type 4 in a high rate, in contrast to Type 3 sentences. Clearly, the L2 groups as well as the Korean control group discriminate between Type 3 and Type 4 in their use of overt pronouns. In order to observe whether there is an apparent distinction in the responses between Type 3 and Type 4 sentences in each group, a paired-sample *t*-test was conducted. As can be seen in Table 29, both L2 groups and the control group demonstrate a significant distinction in the use of the overt pronoun between Type 3 and Type 4 ($p<0.05$). These results confirm sensitivity to the OPC for the L2 learners and the native Korean speakers.

Table 29: The within-group comparisons for production of the overt object pronoun between Type 3 and Type 4 sentences in the translation task

Sentence types	L2 intermediate (n=19)			L2 advanced (n=22)			Korean control group (n=20)		
	<i>M</i>	<i>SD</i>	<i>t</i>	<i>M</i>	<i>SD</i>	<i>t</i>	<i>M</i>	<i>SD</i>	<i>t</i>
Type 3	0.89	1.29	-4.043	0.50	0.86	-9.289	0.10	0.31	-16.000
Type 4	2.42	1.39	$p=0.001$	2.82	0.96	$p=0.000$	3.30	0.92	$p=0.000$

To summarise, the English-speaking learners of Korean demonstrate a clear OPC effect as a group in the translation task. Both intermediate and advanced groups behave like the Korean controls in Type 1 sentences. This result indicates that L2 learners clearly show knowledge of the OPC in subject position, regardless of their proficiency level. Their performance of Type 3, however, is different from that of Type 1. While the advanced group performs like the Korean control group in Type 3, the performance by the intermediate group exhibits a significant difference from the control group statistically in this sentence type. However, the intermediate learners' production of null pronouns in Type 3 shows a relatively high percentage of responses. Although the performance of the intermediate group is significantly different from that of the Korean control group, it does not imply that the intermediate learners do not demonstrate knowledge of the OPC. As can be seen in Table 26, there is a gradual improvement on producing a target response as their proficiency level of Korean increases in Type 1 as well as in Type 3.

5.7.2 Individual results

Turning to the individual performance, this study has observed the individual data in the same way as the comprehension task. I have first examined the consistency rate of the participants in the elicitation of the target response for Type 1 and Type 3 sentences, as shown in Table 30. This consistency rate presents the number of participants who produced a null pronoun (or *caki*) for the OPC contexts, which is a correct response, in at least three out of the four test sentences.

Table 30: Percentages with which a target pronoun was elicited at least three out of the four items in Type 1 and Type 3 sentences

Group	Type 1(bound reading for a subject pronoun)		Type 3 (bound reading for an object pronoun)	
	no.	%	no.	%
Korean controls (n=20)	20	100	20	100
L2 advanced (n=22)	22	100	19	86.36
L2 intermediate (n=19)	18	94.74	14	73.68

In Table 30, all the Korean controls completely rejected an overt pronoun in subject position as well as in object position. It is seen that there is a similarity in the consistency pattern between the Korean controls and the advanced learners in Type 1 sentences. Furthermore, the majority of the advanced learners (86.36%) did not produce the overt object pronoun for Type 3 in at least three out of four tokens. However, three advanced learners did not exhibit a consistent pattern of the expected correct response, which may imply that these learners do not appear to show the contrast between overt and null object pronouns. As for the intermediate learners, 94.74% and 73.68% of them exhibited the OPC in Type 1 and Type 3, respectively. Both L2 groups perform better in Type 1 than in Type 3, which is also demonstrated by the group results. These data show a development across groups in the production of the correct response in Type 1 and Type 3, and their consistency rates confirm the group results in this translation task (see Table 26), contrary to the comprehension task. Now let us observe the individual number of participants who produced an overt pronoun in Type 1 and Type 3, the response which is not permitted in Korean.

Table 31: The number of times that native speakers of Korean (n=20) produced an overt pronoun in Type 1 and Type 3 sentences

no. of times overt pronouns produced	Type 1 (bound reading for a subject pronoun)		Type 3 (bound reading for an object pronoun)	
	no.	%	no.	%
0	18	90	18	90
1	2	10	2	10
2	0	0	0	0
3	0	0	0	0
4	0	0	0	0
Total	20	100	20	100

90% of the Korean controls (18 out of 20) did not use an overt pronoun at all in Type 1 and Type 3 sentences, as shown in Table 31. Conversely, the L2 intermediate and the L2 advanced learners exhibited a different distribution from the Korean native controls (see Tables 32 and 33). It can be observed that the Korean controls do not differentiate the translation of the overt pronoun in subject position from that of the overt pronoun in object position in bound-variable contexts when the matrix subject is a QDP.

Table 32: The number of times that intermediate learners (n=19) produced an overt pronoun in Type 1 and Type 3 sentences

no. of times overt pronouns produced	Type 1 (bound reading for a subject pronoun)		Type 3 (bound reading for an object pronoun)	
	no.	%	no.	%
0	12	63.16	11	57.89
1	6	31.58	3	15.79
2	1	5.26	2	10.53
3	0	0	2	10.53
4	0	0	1	5.26
Total	19	100	19	100

63.16% and 57.89% of the intermediate learners did not produce an overt pronoun at all in Type 1 and Type 3. This data shows that there is considerable individual variation regarding the use of the target pronoun. It is noted that subject number 11 elicited only a null pronoun across all the sentence types (see Appendix 7.2). Furthermore, there are some learners (e.g. subject number 6, 7, and 11) who produced only a null pronoun in Type 3 structures who also produced a null pronoun in Type 4 sentences (discourse-based disjoint reading for an object pronoun with a QDP matrix subject). These learners may have a preference or the use of null pronouns. However, this does not suggest that they have no sensitivity to the OPC effect since the OPC restriction can only be observed in Type 1 and Type 3.

Table 33: The number of times that advanced learners (n=22) produced an overt pronoun in Type 1 and Type 3 sentences

no. of times overt pronouns produced	Type 1 (bound reading for a subject pronoun)		Type 3 (bound reading for an object pronoun)	
	no.	%	no.	%
0	18	81.82	15	68.18
1	4	18.18	4	18.18
2	0	0	2	9.09
3	0	0	1	4.55
4	0	0	0	0
Total	22	100	22	100

As illustrated in Table 33, 81.82% and 68.18% of the advanced learners did not assign an overt pronoun in Type 1 and Type 3 sentences, respectively. Some of the advanced learners obviously demonstrate a different performance between Type 1 and Type 3 sentences. Among the learners who only produced a target pronoun (e.g. null or *caki*) in Type 1 and Type 3 structures, participant number 14 did not make a distinction in their use of null and overt pronouns across the sentence types (see Appendix 7.3). This participant displays a strong preference for the use of the null pronoun. In addition, participant number 5 shows a preference for a null pronoun in subject position, and subject number 13 also shows the same phenomenon in object position. Again, these learners' overuse of the null pronoun does not imply that the OPC is not operative in their interlanguage grammar.

Taken together, the individual results by the two L2 groups demonstrate variation to some degree in Type 1 (bound reading for a subject pronoun with a QDP matrix subject) as well as in Type 3 (bound reading for an object pronoun with a QDP matrix subject), when compared to the Korean controls. This data demonstrates a progressive acquisition pattern in the rate of the use of the null pronoun (including *caki*) in Type 1 and Type 3 sentences as the L2 learners' proficiency level increases. That is, the advanced learners perform better than the intermediate learners in the OPC-relevant constructions. Moreover, the two L2 groups perform better in Type 1 than in Type 3. These individual data by both groups clearly show more violations in Type 3 than in Type 1, in contrast to the group data presented in Table 25.

5.7.3 Summary of the translation task data

To summarise the context-based translation task, the two L2 groups show OPC effects in subject (Type 1) and object (Type 3) positions. However, their performance of Type 1 is not similar to that of Type 3 sentences. As for Type 1, both intermediate and advanced groups did not exhibit a significant difference from the Korean control group. As for Type 3, the intermediate group shows a significant difference from the Korean control group but the performance by the advanced group did not show a significant difference from the control group in this sentence type. The individual data that I observed provides obvious learner variation. In particular, the individual L2 speaker in

both groups has performed better in Type 1 than in Type 3, which is not observed by the group data.

5.8 Summary and discussion

The first aim of the OPC study was to uncover empirical evidence concerning whether L2 speakers acquire grammatical knowledge of the OPC in L2 Korean. The second aim of this study was to look into the issue of whether the OPC in Korean is maintained not only in subject position but also in object position. This study demonstrates that the group results of the OPC in subject position are consistent with previous findings, particularly for the intermediate learners (e.g. Kanno 1997, 1998; Pérez-Leroux & Glass 1999; Rothman & Iverson 2007a, b; Rothman 2009). The individual-level results in this study, however, do not entirely replicate a similar finding to the group data. In this section, I discuss and present important aspects of L2 acquisition to support the following observations with respect to the research questions:

1. The Korean native speakers do not exhibit an asymmetry of the OPC between subject and object pronouns. This finding confirms that the grammatical status of null object in Korean is *pro*.
2. The group results show that the OPC in both subject and object positions seems to be operative in L2 speakers.
3. The individual results demonstrate that some learners have performed better on subject position than on object position; furthermore, these individual data have shown a gradual progress in L2 speakers according to the proficiency level.
4. Although the L2 speakers have knowledge of the OPC in their grammar, it does not entail that learner behaviour is necessarily targetlike.

The present study has attempted to evaluate the validity of the ‘Full Access’ account (e.g. Schwartz & Sprouse 1994, 1996). The reason why I was not concerned with the ‘Full Transfer’ account was that the intermediate learners in this study appear to be

beyond the initial state of L2 development. The intermediate learners already reached a higher proficiency level, so the current study could not obtain meaningful data for the 'Full Transfer' part of the Full Transfer/Full Access hypothesis. The target responses of the intermediate group for the OPC-related sentences (QDP+overt subject or overt object) are largely accurate in the comprehension task, and they are not significantly different from the scores obtained by the advanced group. Similarly, the results of the translation task show that the performance of the intermediate group reveals no significant difference from that of the advanced group in Type 1 (bound reading for a subject pronoun with a QDP matrix subject) and Type 3 (bound reading for an object pronoun with a QDP matrix subject). The group results clearly show that English learners of Korean exhibit knowledge of the OPC in subject position as well as in object position, irrespective of learners' proficiency levels.

As for the learning environment for L2 learners, there are at least two factors against L2 restructuring in the process of the 'Full Access' account of the FT/FA (according to the FT/FA, L2 speakers restructure their grammars on the basis of positive evidence from the target language): no direct evidence about the unacceptability of the bound variable reading in Korean and the low frequency of the OPC constructions in the target language input. Moreover, the ambiguity of the L1 native grammar between disjoint and bound variable readings appears to pose problems for L2 learners. Nonetheless, the participants in both groups abandon the L1-based grammar and accommodate the syntactic restriction of the target grammar. This outcome leads to the conclusion that abstract grammatical knowledge is implicated in L2 speakers' grammatical representations of overt and null pronouns in quantifier-binding constructions. Its finding shows that the targetlike performance between the L2 speakers and the Korean controls can be accommodated within the same mental architecture, UG, in L1 and L2 acquisition. Consequently, the finding seems to be in line with previous studies, lending support to the evidence of full access to UG in adult L2 acquisition.

However, this study does not fail to indicate the L1 transfer. The individual data has precisely shown the L1 influence. Let us consider the individual results of the OPC in subject position first. In the comprehension task, 36.84% of the intermediate learners and 54.55% of the advanced learners show complete accuracy in respect to the QDP

sentences when the pronoun is in subject position (Type 1, note that 85% of the Korean natives did not accept a bound interpretation in Type 1). For the translation task, 63.16% of the intermediate learners and 81.82% of the advanced learners demonstrate a consistent choice of null pronouns in Type 1 (bound reading for a subject pronoun with a QDP matrix subject, note that 90% of the Korean controls did not produce an ungrammatical overt pronoun in this sentence type). We can see a progressive acquisition pattern regarding the OPC with the overt subject pronoun as the L2 speakers increase in proficiency level in Korean. The intermediate learners show low rates of targetlike responses and the advanced learners demonstrate development that is constrained by the OPC. Similarly, the L2 intermediate learners reveal the lowest scores regarding the rejection of the bound interpretation in Type 1, whereas the L2 advanced learners show the lowest scores regarding the acceptance of the overt subject pronoun as a bound variable reading. Having reference to this point, it may be the case that the existing English L1 grammar might be interfering, thereby having an effect on the acquisition of properties of the L2 which differ in both grammars. That is, the learners' own native grammar can be contributing to the L2 learners' misanalysis of the OPC constructions since they prefer the option which is available in their L1 and not in the L2. As such, this in fact presents clear evidence in support of the L1 transfer effects. Moreover, although the L2 advanced learners in this study do not seem to have reached a complete target grammar yet, they are in a transitional state of interlanguage grammar. L2 restructuring under the 'Full Access' to UG account appears to be operational as we see a clear OPC effect by the L2 speakers in both proficiency levels. Observed OPC effects in the L2 speakers thus support the view that access to UG is fully available.

A question remains as to why the individual result in both groups shows variation. This variation becomes problematic, particularly for the Korean native speakers, even though they are far more consistent when the individual data of the L2 speakers are taken into account. This is because, from a UG point of view, a principle of UG should be 'built-in' by native speakers, so that they are expected to perform at 100% accuracy. However, as can be seen in Table 17, previous studies also showed a certain degree of native speakers' violation of the OPC. The errors made by native speakers may represent task factors but not represent the lack of the OPC effect. As none of the natives accepted an

ungrammatical reading more than once in Type 1 and Type 5 in the comprehension task in contrast to the L2 speakers, this explanation for the controls' violation seems feasible. Across all the previous studies, there are very few native speakers allowing overt pronouns for OPC contexts in Table 17. Crucially, the main variation for the native speakers is in whether they allow both interpretations for Type 2, 3, and 4 or whether they choose either only disjoint or only bound interpretation. Methodological attempts were made to improve the rate of the 'both' response for these sentence types, however the native speakers selected either a disjoint or bound interpretation confirming the previous studies. Although the native speakers' response pattern for Type 2, 3, and 4 is not directly relevant to knowledge of the OPC, it should be considered how we can ensure the reliability of the learner data if the controls did not give the 'expected' results. As briefly mentioned in Section 5.6.1, the native speakers' tendency for selection for either one or the other may be because they have always been required to make a decision for a correct or incorrect answer, so that they may perhaps feel uncomfortable making a choice of two 'Yes' or two 'No' in their performance. This tendency to select only one reading is also observed in L2 speakers. Furthermore, there might be semantic or discourse effects towards the selection of the null or overt pronoun in this kind of sentence type (see Section 5.6.1).

To summarise for the OPC in subject position, the L2 learners successfully obtain OPC knowledge despite this being a POS learning condition. Furthermore, full access to UG under investigation is confirmed as the L2 learners show knowledge of OPC restrictions. Although the individual data demonstrate a clear L1 transfer effect, the group results do not provide a developmental progression across L2 groups in the comprehension task (but the group results in the translation task show a little increase according to the learners' proficiency level). It should be noted that the scores of the translation task are higher than those of the comprehension task. These differences between the two tasks may be attributed to the design of the task itself. It is supposed that the translation task used in this study might have allowed the participants to draw on metalinguistic knowledge to some extent, as pointed out by Antonella Sorace (personal communication).

Turning to the OPC in object position, the Korean native speakers clearly show the instantiation of the OPC in object position, as in subject position. This result suggests that Korean speakers treat the null object as a *pro*, thus they demonstrate a parallel behaviour of the OPC between subject and object pronouns. For the L2 speakers, the group results exhibit the OPC effect in object position as well. Although the two L2 groups do not show a significant difference in the selection of the target response between Type 1 (QDP+overt subject) and Type 5 (QDP+overt object) in the comprehension task, quite poor performance for the OPC in object position is observed at the level of the individual data. Only 26.32% of the intermediate learners and 22.73% of the advanced learners show complete accuracy in Type 5 (QDP+overt object) in the comprehension task; whereas 75% of the Korean controls exhibit a decisive selection of the disjoint reading in this sentence type. For the translation task, 57.89% of the intermediate learners, 68.18% of the advanced learners, and 90% of the Korean controls assign a correct response in all test items of Type 3 (bound reading for an object pronoun with a QDP matrix subject). Contrary to the comprehension task, the intermediate learners and the advanced learners manifest a different behaviour in the translation task according to the proficiency level. We can see a somewhat less targetlike acquisition pattern for the OPC in object position in both tasks, when compared with the scores of the OPC in subject position. As for the results of the object pronoun constraint, the individual data show lower rates of correct performance in both tasks in comparison to the results of the subject pronoun constraint. Also, there is no observable development on the target property across learners' proficiency levels in the comprehension task. Although the group results demonstrate the L2 speakers' OPC effect in object position, their individual scores do not conform to the Korean natives' scores.

The immediate question arises: how can we account for variation in the individual data of the OPC between subject and object positions? This study tentatively proposes different accounts for learner variation. Firstly, I retain the claim that violations of the OPC with overt object pronouns may be due to a deficit regarding L2 speakers' knowledge of the syntactic properties of pronouns themselves, and not because of the OPC. In the literature, subject/object asymmetries in the use of L2 learners' null pronouns have been reported, even though not many studies have examined null

pronouns in both subject and object positions (e.g. Polio 1995; Yuan 1997; Park 2004). Undoubtedly, the properties associated with null pronouns are complex since each language licenses the presence of null forms under different syntactic, semantic, and discourse conditions. For instance, Park (2004) claims that it is not difficult for Korean learners of English to learn English subjects since Korean and English have the same uninterpretable agreement features. However, Korean and English differ in the strength of theta-features.⁸⁴ For Park, languages with strong theta features such as English do not allow null objects since the theta feature of the verb needs to be checked that of the object before Spell-Out. In languages with weak theta features like Korean, checking of the theta-feature can be postponed until after Spell-Out. Thus, null objects are allowed in Korean. It is, therefore, possible that Korean learners of English may take time to learn the properties of strong theta-features, which may result in learners dropping more objects than subjects. Previous L2 studies on the asymmetry in the use of null subjects and null objects have not addressed the acquisition of the null pronouns in quantifier-binding constructions, so this explanation seems rather doubtful.

Secondly, and perhaps more plausibly, the subject/object asymmetry by some individual learners can possibly be accounted for in the OPC effect under the assumption that learners may take surface null objects as a variable A'-bound by a null operator such as Chinese (Huang 1984, 1989). Under Huang's (1984) analysis (see Chapter 3), empty subjects and empty objects have different syntactic status, thus different interpretations can be derived. Therefore, in this case, binding is possible if an overt pronoun occurs as an object, so the pronoun may be A'-bound. In other words, it is viable that these individual learners who show a subject/object asymmetry in the OPC effect have a Chinese type of grammar, yet different from the native Korean speakers. Although their knowledge of the OPC does not represent properties of L1 English nor L2 Korean but does occur in other languages such as Chinese, the learners' interlanguage grammar is still UG-constrained (e.g. Schwartz & Sprouse 1994, 1996).

Lastly, another possible explanation for learner variation regarding knowledge of the OPC in object position even for some advanced learners at the individual level may be

⁸⁴ Argument DPs, such as a subject and an object, in a sentence get theta roles (i.e. semantic roles) assigned to them through feature checking mechanism under a Minimalist theory of language. Different arguments play different semantic roles with respect to their predicates.

attributed to the lack of evidence in the L2 input. In light of the absence of the OPC in English and the impoverished target language input, acquiring the interpretative constraint on overt pronouns in L2 is problematic for learners. I have already discussed the OPC in subject position is also underdetermined by input, but a relatively high number of individual learners demonstrated a clear UG-constrained OPC effect. Although the L2 input does not provide any information as to when the overt pronoun may occur with particular interpretations (i.e. distinction between bound variable and disjoint readings), learners may perhaps encounter a sentence where an overt pronoun is placed mostly in subject position. As I have briefly mentioned in Chapter 3, the use of the overt pronoun *ku* in colloquial speech is less preferred (see Kang 1988), so that learners may not frequently be exposed to the usage of the pronoun *ku*. It is possible to assume that this tendency of rarity in the use of *ku* is much stronger in object position than in subject position. Consequently, learners may not receive any useful data regarding the application of the overt object pronoun. Hence, it is assumed that they show a different behaviour between subject and object pronouns in the OPC-related contexts. Nevertheless, it is still unclear as to exactly what causes the lack of OPC effects in object position through the individual data. More research is needed to reveal the reason for this finding. The present study, therefore, leaves this issue open for future investigation.

CHAPTER 6

A STUDY OF THE L2 ACQUISITION OF ANAPHORIC BINDING

This chapter presents an empirical study which examines the role of features in the acquisition of locality and orientation constraints of English reflexives by Korean speakers. It is acknowledged that parts of this chapter have appeared in *Language Acquisition* (2012) co-authored with Domínguez and Hicks. As discussed in Chapter 4, I assume that nonlocal Korean reflexives take the semantic bound variable mechanism in their feature specification, while the English reflexives need to instantiate the anaphoric dependency approach through the Agree operation. Acquiring the binding constraints requires new binding mechanisms from the L1 semantic variable binding by Topic to the L2 syntactic referential dependency. Therefore, the acquisition problem confronted by L2 speakers is to find out what kind of features of the target language are involved in the target grammar as well as what kind of mechanisms give rise to the properties of reflexives. L2 learners should figure out different feature specifications in the target grammar. Thus the learning task in this case involves reanalysing learners' valued [VAR] feature of the L1 with an unvalued version of the L2 feature as well as the mechanism responsible for syntactically valuing formal features via the grammatical operation of Agree. Since Agree is universally available through UG, knowledge of locality and orientation constraints will naturally follow once L2 speakers acquire the target featural configuration of the anaphoric pronoun. Thus they will not have to learn these two constraints. Since English and Korean use different feature configurations under the feature-based approach concerning reflexives, this study predicts L2 speakers' learning difficulty in the L2 grammar. I demonstrate that one crucial consequence of the feature-based approach is that even if L2 speakers show target knowledge of locality restrictions, as shown in previous research, this cannot be taken as evidence that L2 speakers have acquired the correct mechanism for anaphoric binding in the target grammar. This is because the selection of local antecedents in the L2 does not necessarily entail having acquired a different mechanism for anaphoric binding, under this new approach.

For the learning tasks in the acquisition of English binding properties by Korean speakers, acquiring both locality and orientation constraints in English requires the reconfiguration of the relevant features in the L1 for the L2 since different feature combinations are involved in each language. This analysis converges on the current Feature Assembly Hypothesis (FAH) (Lardiere 2008, 2009), which is framed within the Minimalist analysis of grammar (Chomsky 2000, 2001). As sketched in Chapter 2, Chomsky describes language acquisition as a process which involves the selection of features from a universal set of features made available by UG and the use of those selected features to construct lexical items that enter into the computation. Languages therefore differ in how these features are grouped together into individual lexical items and functional categories. Lardiere places emphasis on the role of feature (re)assembly in the acquisition of a second language. Under Lardiere's Feature Assembly analysis, L2 learners who come to the learning task with fully assembled feature matrices of L1 grammar have to select new features for the L2 and to reassemble existing features. This process is mediated by access to UG (comprising a universal computational system) alongside appropriate positive input. Therefore, Lardiere argues that acquiring an L2 grammar is not only upon the question of the availability of specific syntactic features (see Section 2.2.3.3).

In this chapter, the validity of the FAH is tested by empirical data obtained from a picture verification task. The experimental data is collected from three different groups of Korean-speaking learners of English and an English control group. The rest of this chapter is structured as follows. I present the research questions, hypothesise the predictions in relation to the aforementioned research questions, and provide background information about the subjects who participated in this study. Subsequently, this chapter presents the procedures and the task used for the experiment. Lastly, I discuss the results from the experiment.

6.1 Research questions

Under the feature-based reinterpretation of the binding constraints, this study seeks to explore the following research question:

Do Korean L2 learners of English acquire new ‘referential dependence’ syntactic features of English reflexives as well as the mechanism for how these features are valued, different from semantic variable binding features found on Korean reflexives?

With respect to the main research question above, the three subquestions will be investigated as follows. It should be noted that these three questions cannot be compatible with one another:

1. Do Korean-speaking learners of English show an acquisition pattern whereby both locality and orientation constraints are correctly acquired?
2. Do Korean-speaking learners of English show an acquisition pattern of ‘locality before orientation’, the locality condition being first acquired before the orientation condition being acquired?
3. Do Korean-speaking learners of English show an acquisition pattern of ‘orientation before locality’, the orientation condition being first acquired before the locality condition being acquired?

The first question concerns the issue of whether Korean learners of English correctly acquire L2 English binding properties of locality and orientation via the successful reanalysing the [VAR] feature on English reflexives. If Korean speakers acquire this new feature configuration associated with syntactic dependency of English anaphors, they would acquire both locality and orientation constraints simultaneously. This is because the syntactic operation Agree allows subject or non-subject binding within the phase-based locality constraint. Therefore, given that Korean speakers reconfigure their feature mechanisms to syntactic features, both locality and orientation can be achieved.

The second question is to examine whether Korean learners of English have difficulty in correctly reanalysing the [VAR] feature on English reflexives due to the L1 transfer (e.g. the valued [VAR: Reflexive] feature of the Korean local reflexive *caki-casin*). If Korean speakers exhibit the pattern of ‘locality before orientation’, this would suggest that they transfer their L1 local option into the L2 and that they still have trouble with a new

binding configuration.

The third question asks whether the acquisition pattern of ‘orientation before locality’ is potentially possible. I assume that the acquisition of the absence of an orientation restriction in English necessarily involves positing an unvalued [VAR] feature on English reflexives. Therefore, this scenario is not feasible. Even though Korean-speaking learners of English fail to reanalyse the new [VAR] feature correctly, this acquisition pattern should not be attested.

6.2 Hypotheses and predictions

Following the Feature Assembly hypothesis (FAH) (Lardiere 2007a, b, 2008, 2009) on the basis of the Full Transfer/Full Access (FT/FA) hypothesis (Schwartz & Sprouse 1994, 1996), the subsequent hypotheses can be formulated in order to test the role of features in L2 acquisition.

1. **Hypothesis 1:** L2 learners fail to reassemble target features.

Korean-speaking learners of English in the lower proficiency level would start out with a fully assembled set of L1 lexical items and grammatical categories. Thus, they would transfer their L1 local configuration (e.g. the [VAR: Reflexive] feature of the Korean local reflexive *caki-casin*) into the initial L2 representation, in particular if we assume the ‘Full Transfer’ part of the FT/FA hypothesis.

2. **Hypothesis 2:** L2 learners successfully reassemble target features.

Korean-speaking learners of English in the advanced proficiency level would reconstruct the relevant assembled features from the L1 into the L2 employing the Agree operation, which is universally available through UG. Thus, they would successfully reanalyse the [VAR] feature of English reflexives and reconfigure those onto the new language-specific binding properties of the L2. This hypothesis is consistent with the ‘Full Access’ part of the FT/FA hypothesis.

The first hypothesis is hinted at by the ‘Full Transfer’ account of the FT/FA hypothesis proposed by Schwartz & Sprouse (1994, 1996). This study assumes that the initial state of the L2 grammar constitutes L1 lexical features and functional categories. It should be noted that the role of L1 in the FT/FA is somewhat different from that of the FAH. Under the FAH, the L1 is defined as pre-given linguistic knowledge which is selected and assembled onto lexical items. Accordingly, this study hypothesises that learners’ native knowledge of how the relevant lexical items are organised plays an important role in reconfiguring a target grammar. More specifically, the lower proficiency learners would maintain their pre-assembled local feature combinations (e.g. *caki-casin*) into the L2. Since the Korean reflexive *caki-casin* is morphologically similar to English reflexives and also this reflexive only allows local binding, the Korean speakers’ L1 valued [VAR: Reflexive] feature of *caki-casin* (‘self-self’) would be transferred to the learners’ interlanguage as an initial stage of the L2.⁸⁵ Consequently, they would demonstrate a persistent failure in reanalysing the unvalued [VAR] features found on English reflexives under the FAH. This would result in targetlike behaviour regarding locality, but not orientation.

The second hypothesis has been built on the ‘Full Access’ part of the FT/FA, which suggests that the more proficient learners would restructure their interlanguage grammars on the basis of robust L2 input via full UG access. Therefore the advanced L2 speakers would successfully reanalyse the unvalued [VAR] feature of English reflexives and consequently they would be able to reconfigure the relevant feature bundles from the L1 in the L2. In keeping with the Minimalist conceptions, syntactic operations such as Agree are engendered by the computational system which is innate. Thus, we can assume that access to UG along with appropriate L2 input would contribute to L2 learners’ reconfiguration of the target grammar. Based on the research questions and hypotheses, specific predictions to be addressed are as follows:

1. **Prediction 1:** This study predicts the possibility of a failure to reanalyse the [VAR] feature of English reflexives by L2 learners in the lower proficiency level. This means that learners cannot posit an unvalued [VAR] feature on

⁸⁵ Further reasons why the long-distance reflexive *caki* is not transferred will be explained in Section 6.6.4 and Section 6.7.

English reflexives, but they transfer a Korean local feature value for English reflexives. In this prediction, we expect an acquisition pattern whereby locality appears to be acquired but orientation is not. This involves learners' L1 transfer of the valued [VAR: Reflexive] feature of the Korean local reflexive such as *ku-casin* 'him-self' and *caki-casin* ('self-self'), which reflexivises only the most local predicate. In this prediction, the locality constraint seems targetlike, but local binding is in fact arised from learners' L1 transfer as L2 speakers still hold their L1 features into the L2. Thus it is predicted that L2 learners in the lower proficiency level would not reconfigure the appropriate features yet. In this possibility, knowledge of locality would be apparently acquired, but not orientation.

2. **Prediction 2:** This study predicts the possibility of a successful reanalysis of the [VAR] feature of English reflexives by L2 learners in the advanced proficiency level. This prediction results in an acquisition pattern whereby both locality and orientation are correctly acquired by more proficient learners. This involves the positing of a new unvalued [VAR] feature on English reflexive and at the same time involves the rejection of the valued [VAR: Topic] feature of *caki* and [VAR: Reflexive] feature of *caki-casin*. The mechanism by which feature is valued, the operation Agree, is provided by UG. In this prediction, the target grammar would be successfully acquired.
3. **Prediction 3:** This study does not predict an acquisition pattern whereby orientation is acquired without having acquired locality. If L2 speakers have reconfigured the new feature combinations for the English reflexive, the restriction of locality and orientation will both naturally ensue. In this case, the acquisition pattern whereby orientation before locality cannot occur since orientation always comes along with locality from the correct featural composition of the reflexives.

This study is motivated by the observation made in the previous L2 binding research that knowledge of locality seems to be acquired before orientation is acquired. Under

the feature-based approach to L2 binding, this study would be able to provide an appropriate account for the dissociation pattern previously observed in the L2 acquisition of locality and orientation.

6.3 Participants

A total of 70 Korean-speaking learners of English divided into three proficiency groups (19 low-intermediate, 26 intermediate, and 25 advanced learners) participated in the study. The L2 participants were recruited from two institutions in Korea through personal networks. The original pool of subjects was comprised of 88 learners. However, 18 subjects were excluded from the data analysis because: i) some of them did not meet the required proficiency level, ii) some of them did not complete the test properly, or iii) some of them withdrew their participation in the actual test. The control group consisted of 20 English native speakers, who were undergraduates at the University of Southampton, UK, at the time of testing.

All L2 participants filled out a background questionnaire to find out their prior experience with English (see Appendix 4 for the background questionnaire). All of them were monolingual speakers of Korean and had learnt or were learning English as a foreign language. The participants had been taught English in Korea largely in a classroom environment with the main emphasis on grammar and vocabulary. The L2 subjects had started learning English at an average age of 8; 09⁸⁶ and the mean time learning English was 11 years and 6 months. The L2 participants were homogeneous on age, the age of the first exposure to English, and the year of learning English (see Table 34). All Korean participants took an English proficiency test consisting of vocabulary and grammar, taken from Macmillan Placement Test (2007) available on-line. Based on the scores of this test, the subjects were divided into three levels: low-intermediate, intermediate, and advanced. The level of the proficiency was determined in accordance with cut-off points already defined by the test. Only learners of at least low-intermediate proficiency level were included in the study. A one-way ANOVA with *proficiency scores* as the dependent variable and *group* as the independent variable indicated a

⁸⁶ Most of the L2 participants had received the English lessons starting in Grade 3 at elementary schools in formal settings.

highly significant difference across the three non-native groups with respect to their English proficiency ($F(2, 67)=157.397, p=0.000$). Table 34 below summarises the relevant background information of the L2 participants.

Table 34: Summary of background information of L2 learners
(means and standard deviations)

Group	Mean Age	Mean age of first English exposure (years)	Mean time learning English (years)	Mean scores of proficiency test (n=50)
Low-inter. (n=19)	19.6 (1.4)	9 (2.7)	10.6 (1.9)	29.4 (3.2)
Intermediate (n=26)	21.9 (2.2)	9 (2.3)	12.3 (2.7)	36.7 (1.6)
Advanced (n=25)	20.4 (2.0)	8.9 (1.8)	11.8 (2.6)	41.6 (1.9)
Total (n=70)	20.7 (2.2)	8.9 (2.2)	11.6 (2.5)	36.5 (5.3)

6.4 Methodology

6.4.1 Task: The picture verification task

A picture verification task was designed and administered to Korean speakers of English in order to respond the research questions as well as evaluate the validity of the three predictions. Before looking at the task this study employed, let us briefly consider different methodologies that the previous L2 binding research used, and why, in particular, the picture verification task was adopted in this study.

L2 studies of reflexive binding have used various tasks to determine the nature of learners' interlanguage grammar. An influential study of reflexive binding (e.g. Finer & Broselow 1986) used a picture identification task and this was followed up by a variety of tasks. In the picture identification task, the subjects were instructed to match the correct picture(s) that the sentence best described. Lakshmanan & Teranishi (1994)

argue that the picture task is methodologically problematic because participants' selection of the correct picture may have been based on non-grammatical strategies. Their argument arose from the study of Grimshaw & Rosen (1990), which examined children's low performance on Condition B of the binding theory, relative to their performance on Condition A in L1 acquisition. Grimshaw & Rosen suggested that children's rapid development on Condition A is not due to grammatical knowledge but to a non-grammatical strategy, namely, the '*reflexive action*' strategy. The authors argue that if children adopted this strategy, they would select the picture which displays a reflexive action. If adult L2 learners use this strategy, it is not particularly clear how we can distinguish learners' correct responses between the strategy and grammatical knowledge. Much L1 binding research, such as Chien & Wexler (1990), has used an act-out task or a picture yes/no judgment task because young children are not cognitively mature to take the pen-and-paper task. As for adults' L2 binding studies, previous literature has shown a range of methodology to conduct an experiment. A multiple-choice comprehension task has been extensively used among researchers (e.g. Thomas 1989, 1991, 1993; Hirakawa 1990; Bennett 1994; Matsumura 1994; Yuan 1998). For instance, participants were given a sentence that contains a reflexive and then they were asked to whom 'herself' (or 'himself') could refer. The learners' task was to indicate one answer as a possible interpretation from the potential antecedents. This task often contains a 'don't know' option which learners can choose if they are unsure of the response; however, there is a possible danger in the case is that learners might overrely on this option, in order to avoid making a judgment (Ionin 2011). In addition, a disadvantage of the multiple-choice comprehension task is that when participants are faced a range of antecedent choices, they may fail to select all of the potential antecedents. Lakshmanan & Teranishi (1994) also note that this kind of the task may lead the informants to consider only one antecedent, and thus it may demonstrate learners' preference rather than their syntactic judgments.

The important acquisition tasks in the present study are that learners must reject the long-distance interpretation of the reflexive, and accept the object as an appropriate antecedent. The latter poses a genuine challenge for achieving nativelike success, since in such cases the subject is typically an alternative available antecedent for the reflexive, and may perhaps be pragmatically preferred in some contexts. Thus it is important to

ensure that any rejection of the object as a possible antecedent by the learners is not due to preference bias but because their interlanguage grammar does not permit it.

Several methodological attempts in English L2 reflexive binding research have been made to improve the rate of responses confirming the ambiguity and reducing the extent to which preference rather than grammaticality is tested (e.g. Lakshmanan & Teranishi 1994; Wakabayashi 1996; White et al. 1997). In the studies of Bennett (1994), Thomas (1991), Matsumura (1994), and White et al. (1997), L2 learners received a short training session on ambiguity possibilities prior to the main study. Eckman (1994) reminded learners to think about the ambiguity interpretations in answering his picture identification task. Wakabayashi (1996) designed a sentence judgment task and subjects were asked to indicate their preference by ranking all possible antecedents, from 1 for the most preferred and 2 and 3 for less preferred. Despite all these efforts in methodology, there was apparently little success with the rate of the ambiguity (e.g. Thomas 1991; Bennett 1994, Matsumura 1994; Wakabayashi 1996; White et al. 1997). Among those improvements, consider Lakshmanan & Teranishi's (1994) sentence judgment task which has shown a relatively high percentage of ambiguity by Japanese native speakers, as in (1).

- (1) John said that Bill saw *himself* in the mirror.
- | | | | |
|----|---------------------------|-------|----------|
| a. | 'Himself' cannot be John. | agree | disagree |
| b. | 'Himself' cannot be Bill. | agree | disagree |
- (Lakshmanan & Teranishi 1994: 195)

Lakshmanan & Teranishi made use of negative sentences in order to judge unaccepted antecedents. The authors argued that this type of the task, whereby asking participants to indicate who could not be an antecedent, would decrease a preference of only one possible antecedent or the other. Their result demonstrated that 58% of the Japanese controls chose ambiguous interpretations. However, it would seem that the process of consideration of negative sentences (through selecting impossible antecedents) may perhaps lead learners to choose the incorrect option.

White et al. (1997) tried to overcome methodological difficulties in investigating learners' knowledge of reflexive binding using story and picture-based truth-value

judgment tasks. The subjects were asked to judge the sentence followed by the context with a story or picture. The authors assert that the beneficial effect of the story-based truth-value judgment task is that it does not need subjects to consider different possible meanings for an ambiguous sentence. This is because they are just expected to answer 'True' or 'False' in a given sentence. The major problem with the use of the story-based truth-value judgment task is that given contexts are often drawn to accept a particular interpretation which might not be allowed in grammar. Furthermore, this task is particularly difficult for low-proficiency learners because they may not fully understand a context.

Having considered the previous methodologies raised in the literature review, the present study adopts a picture verification task. The advantage of the picture verification task is that participants are not forced to consider a specific structure or interpretation under investigation which might be found unnatural (Weert 2002). Also, a reason for the use of the picture verification task is that this study includes low-intermediate speakers whose linguistic competence is not yet fully developed. These represent significant difficulties for the alternative instrument, a story-based grammaticality judgment task. Indeed, a story-based truth-value judgment task (similar to White et al. 1997) was piloted to a few English native speakers and L2 Korean speakers; all expressed awkwardness regarding the task itself, which was thus abandoned. A disadvantage of the picture task is that it is sometimes taken to demonstrate only preference because it does not require participants to explicitly reject a picture as an appropriate representation of the test sentence (Schmitt & Miller 2010; Ionin 2011). For this reason, I was keen to emphasise to the participants the requirement to read carefully all the options A, B, and C in order to raise their sensitivity to potential ambiguity as far as possible.

6.4.2 Constructing test sentences

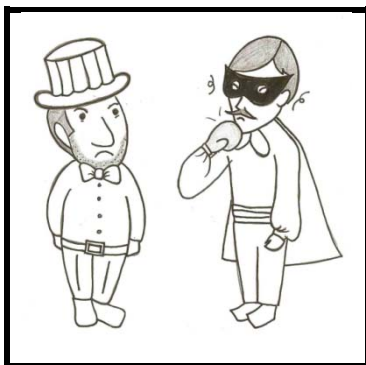
For the purposes of the current study, a picture verification task was developed to test learners' knowledge of locality and orientation constraints in English, adapted from Finer & Broselow (1986), Chien & Wexler (1990), Finer (1991), and White et al. (1997). The participants were presented with two pictures and a sentence containing a reflexive.

Each page contained two different drawings with a target sentence and three options. They were asked to indicate the picture that best matched the given sentence by circling one of three options (A), (B), or (C). If either picture (A) or (B) was possible, they were instructed to choose an option (C). Examples of the test items are illustrated below.

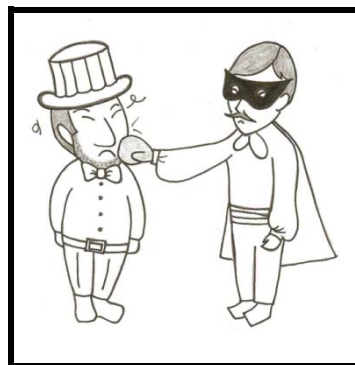
(2) Sample test items

a. Type 1:

Mr. Hat said that Mr. Mask punched himself.



(A)

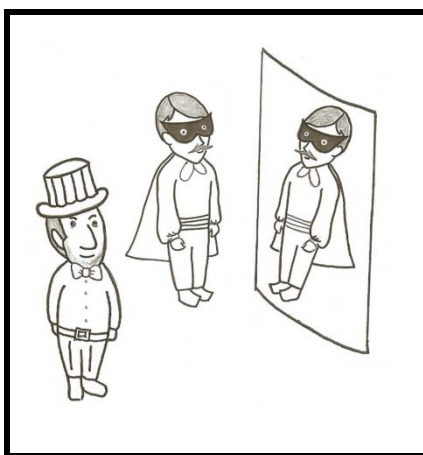


(B)

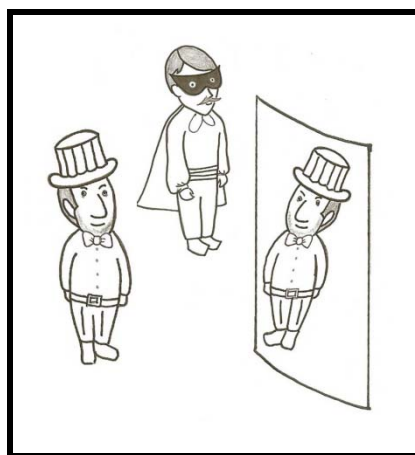
(C) either A or B

b. Type 3:

Mr. Hat showed Mr. Mask a reflection of himself in the mirror.



(A)



(B)

(C) either A or B

The task included 15 target sentences and five distractors. The task sentences were of three different types, and each type consisted of five items. Table 35 below shows the three types of sentences used in the task and the possible antecedents in each sentence type. The distractors involved a similar picture verification task, only using non-reflexive pronouns (*him*, *her*, etc.) in place of reflexive pronouns.

Table 35: Sentence types and possible antecedents in the picture verification task

Type of sentences	Possible antecedents	
	Korean (<i>caki</i>)	English
Type 1 (n=5): Finite bi-clausal sentences e.g. Mr. Hat said that Mr. Mask punched himself .	Mr. Mask (local) or Mr. Hat (LD)	Mr. Mask (local only)
Type 2 (n=5): Non-finite bi-clausal sentences e.g. Miss Curly asked Miss Princess to spray herself with perfume.	Miss Princess (local) or Miss Curly (LD)	Miss Princess (local only)
Type 3 (n=5): Mono-clausal sentences e.g. Mr. Hat showed Mr. Mask a reflection of himself in the mirror.	Mr. Hat (subject only)	Mr. Hat (subject) or Mr. Mask (object)
Type 4 (n=5): Distractors	Not relevant to the study	

Type 1 and Type 2 sentences were designed to test the locality constraint. Type 1 sentences involve finite bi-clausal sentences. Type 2 sentences consisted of non-finite bi-clausal sentences (only the embedded clause is non-finite). The decision to include Type 2 sentences is based on findings from previous research which revealed an asymmetry in the correct binding pattern between finite and non-finite sentences. For the sample test item (2a), if learners choose either *Mr. Mask* or *Mr. Hat* (option C) as an antecedent for the reflexive in this sentence type, it would show that the feature value had not been reanalysed. This means that learners apply their L1 reflexivisation mechanism to the English reflexive, accepting either a local or nonlocal antecedent. If learners select *Mr. Hat* only (option B), they would strongly reject an unvalued [VAR] feature found on English reflexives and, at the same time, they would reject one of the options (e.g. *caki-casin*) available in the L1 (but transfer their L1 valued reflexivising feature of *caki*, since the participants have allowed LD binding only). If learners choose

Mr. Mask only (option A) as an antecedent, the binding pattern would be consistent with a targetlike analysis of reflexivisation, restricted to a local antecedent. However, as noted, this study cannot confirm that learners' performance for the selection of the local DP only is derived from the successful acquisition of new syntactic features of English reflexives. This is because their selection of the local antecedent can be explained by two different possibilities, as outlined in Section 4.6. One such possibility is learners' successful acquisition of the feature specification of English reflexives, differentiating between local and nonlocal DPs. In this case, learners have acquired unvalued 'semanticsyntactic' features of English reflexives accepting only a local antecedent. Once learners involve the anaphoric feature mechanism in locality, this study expects that they also acquire orientation (Type 3) as the relevant feature of reflexives can be checked either by a subject or a non-subject argument. The other possibility is that learners have not acquired the appropriate properties of syntactic features found on English reflexives, but they have transferred the valued L1 reflexivising feature such as [VAR: Reflexive] for the English equivalent to the local Korean reflexives such as *ku-casin* 'him-self' and *caki-casin* 'self-self'. In this case, it is expected that orientation is not acquired since the locally bound Korean reflexives are subject-oriented. Despite locality having appeared to be correct (recall that participants' targetlike locality is derived from the inappropriate licensing of binding), this is why I assume that they have a different feature specification to the English reflexives. For Type 2 sentences, the prediction for each response is similar to Type 1 sentences.

Type 3 sentences were designed to test the orientation constraint in mono-clausal sentences. Once acquisition of the new feature combinations has taken place, both locality and orientation naturally follow. For the sample test item (2b), choosing either *Mr. Hat* or *Mr. Mask* (option C) as an antecedent would show that L2 learners perform as in English grammar. Since their L1 only allows a subject DP *Mr. Hat*, selecting an option C indicates that they have acquired new syntactic feature specifications of English reflexives. If L2 speakers choose *Mr. Hat* only (option B), they would only allow subject binding and reject object binding. Thus, it is assumed that the L2 learners still maintain the L1 reflexivising value in their L2 grammar. If learners select *Mr. Mask* only (option A), they would allow an object antecedent only, which is possible in some contexts in English but not in Korean.

Type 4 consists of 5 items of distractors which involve non-reflexive pronouns and will not be considered in this study.⁸⁷ The details of different sentence types used in the picture verification task and the expected answer are simplified in Table 36.

Table 36: The details of sentence types used in the picture verification task

Types	Binding constraint	Clausal type	Expected answer
Type 1	locality	finite bi-clausal	local only
Type 2	locality	non-finite bi-clausal	local only
Type 3	orientation	mono-clausal	either subject or non-subject

6.5 Procedures

The experiment was conducted in two different universities in Seoul, Korea, where the participants studied. All L2 participants completed their task in two different sessions. In the first session, they were asked to fill out a questionnaire about their previous experience of learning English including their general background. Subsequently, the English proficiency test was administered with a maximum of 45 minutes. When they finished the proficiency test, they had a 15 minute break, then the picture verification task was administered. All the test items in the task were illustrated randomly in the test papers. Written and oral instructions were given. Especially, the L2 learners were provided with test papers which had Korean instructions and the meaning of some words. Participants were instructed to complete the task using their first intuition and particularly they were instructed to read carefully the input sentence with three options (A), (B), and (C). There was no time limit to finish the task, but they were asked not to spend too much time on each item. The participants were also instructed not to change their answers once they had completed each page. Most of the subjects finished the task within 20-30 minutes. The control group only completed the picture verification task. All L2 subjects were tested in the classroom of each institution in Korea, whereas native controls were tested individually and some in groups in the University of Southampton, UK.

⁸⁷ Since pronouns cannot be bound by a local antecedent (under the Condition B effect), the long-distance antecedent is typically selected.

6.6 Results

This section provides a descriptive and a statistical analysis of the group data.

Regarding a quantitative statistical analysis, a within-group comparison and an across-group comparison were conducted. A paired-sample *t*-test was used for the within-group comparison and a one-way ANOVA with a post-hoc Tukey HSD comparison was used for the across-group comparison. The alpha level for all statistical tests was set at $p < 0.05$. Table 37 below shows percentages of all responses obtained from the three Korean L2 groups and the English control group.

Table 37: Percentages of responses by three Korean L2 groups and an English control group in the reflexive binding task

Type of sentences	Option	Low-inter. (n=19)	Intermediate (n=26)	Advanced (n=25)	English controls (n=20)
		%	%	%	%
Type 1 (locality, finite clauses, n=5)	LD	7.37	2.31	0.80	0.00
	local	88.42	94.62	98.40	100.00
	LD/local	4.21	3.08	0.80	0.00
Type 2 (locality, non-finite clauses, n=5)	LD	26.32	17.69	4.80	1.00
	local	71.58	79.23	93.60	99.00
	LD/local	2.11	3.08	1.60	0.00
Type 3 (orientation, n=5)	subject	72.63	75.38	75.20	50.00
	object	23.16	16.92	19.20	5.00
	sub/obj	4.21	7.69	5.60	45.00
Type 4 (fillers, n=5)	LD	83.16	81.53	88.00	96.00
	local	10.53	13.08	9.60	4.00
	LD/local	6.32	5.39	2.40	0.00

Note: The shaded cells indicate expected correct responses in each sentence type.

6.6.1 Group results in locality

The following graph displays percentages of selection of a local antecedent only in Type 1 and Type 2 sentences, which is the correct response for locality. These results show a general preference for local antecedents across both Type 1 and Type 2, although for all groups of learners this preference is stronger in Type 1 than in Type 2.

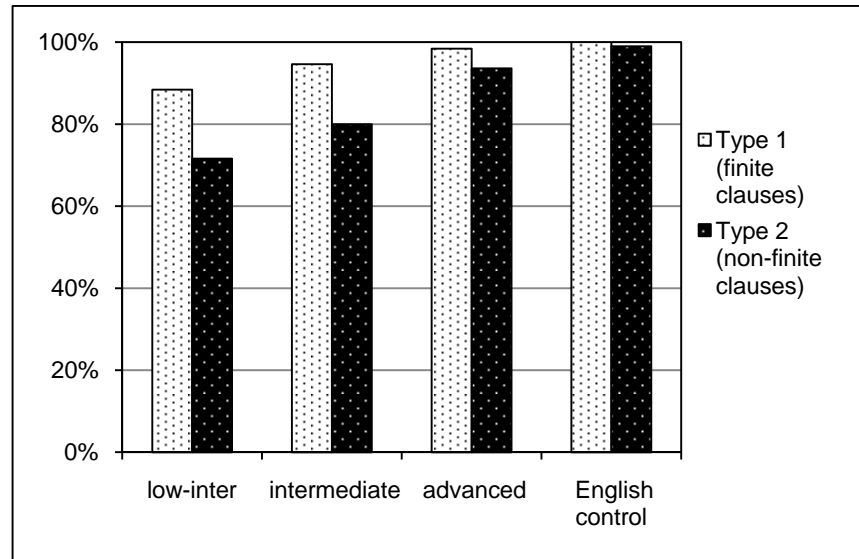


Figure 10: Across-group comparisons for percentages of local binding in locality

From Figure 11 below, all groups show a high percentage of selection of the local antecedent in Type 1; 88.42% of the low-intermediate group, 94.62% of the intermediate group, and 98.4% of the advanced group accepted a local antecedent only in Type 1 structures. The English control group performed perfectly, choosing a local DP as an antecedent for the reflexive pronoun in 100% of the responses. For the Type 1 sentences, a one-way ANOVA with a post-hoc Tukey HSD comparison was run on the data in order to check a significant effect for the across-group comparison in the selection of the local antecedent only.

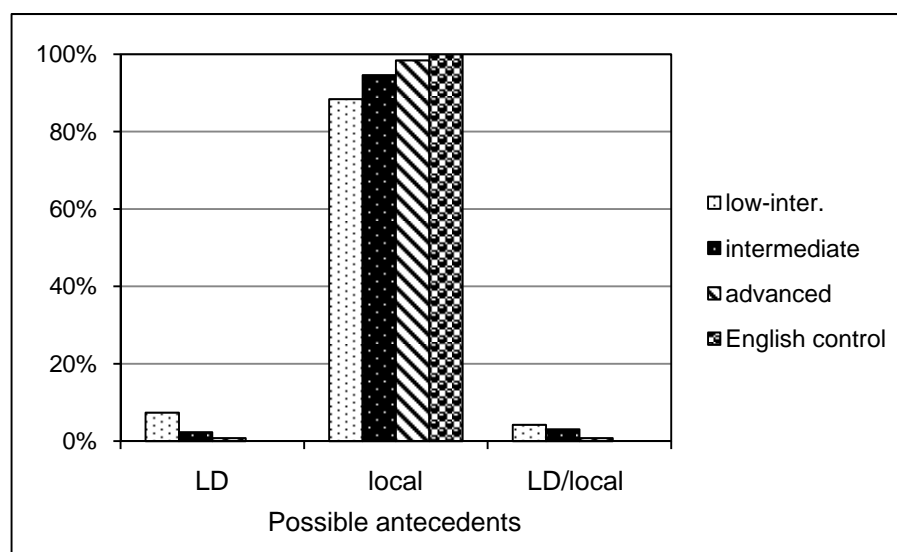


Figure 11: The percentage of responses of Type 1 sentences by all groups

A significant main effect was found for the between-group comparison ($F(3, 86)=6.976$, $p<0.05$): between the low-intermediate and the intermediate groups ($p<0.05$), between the low-intermediate and the advanced groups ($p<0.05$), and between the low-intermediate and the English control groups ($p<0.05$). The low-intermediate group was shown to be significantly different from all other groups. However, no significant difference was found between the intermediate and the advanced groups ($p=0.620$), between the intermediate and the English control groups ($p=0.369$), and between the advanced and the English control groups ($p=0.964$). This implies that the performance of the low-intermediate group significantly differs from that of the intermediate, the advanced, and the English control groups. In contrast, the intermediate, the advanced, and the English control groups behave similarly for this type of sentence based on the statistical significance. As shown in Figures 10 and 11, we can see a gradual improvement in the selection of local binding only for the reflexive pronoun according to the L2 learners' proficiency levels. Conversely, it is observed that there is a tendency to decrease in the choice of LD binding and both (LD/local) bindings, the options that are not permitted in English, as their proficiency increases in Figure 11. This result is consistent with similar findings from previous research which has shown a relatively high percentage of local binding only in Type 1 sentences across different proficiency levels (e.g. Hirakawa 1990; Thomas 1991; Lakshmanan & Teranishi 1994; Akiyama 2002; Jiang 2009).

The response pattern of Type 2 sentences is broadly similar to that of Type 1 sentences in that there was a strong acceptance rate for the local antecedent only by all three L2 groups and the English control group. 71.58% of the low-intermediate group, 79.23% of the intermediate group, and 93.6% of the advanced group chose a local antecedent only. As was observed in Type 1 sentences, we can see a steady improvement on the acceptance of the local antecedent only in Type 2 structures as the L2 speakers' proficiency of English develops in Figures 10 and 12.

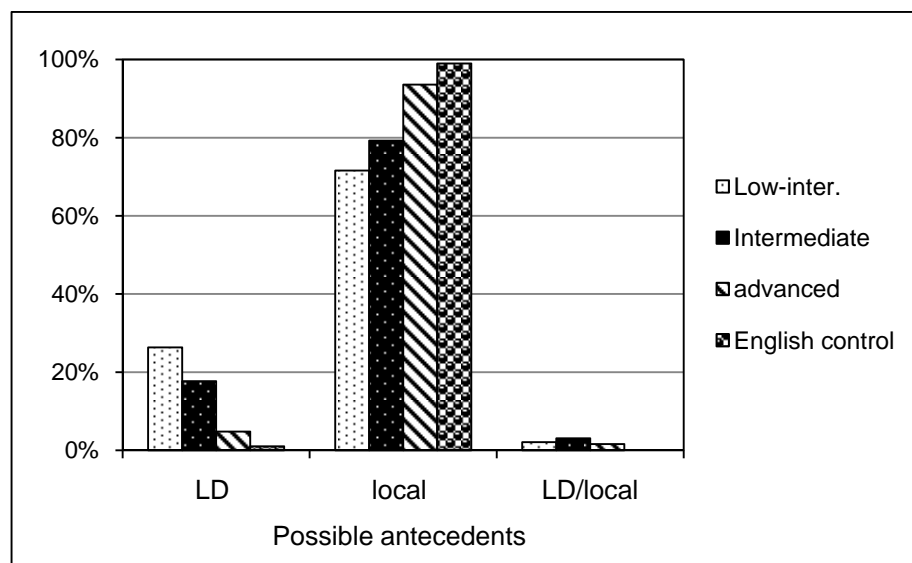


Figure 12: The percentage of responses of Type 2 sentences by all groups

A one-way ANOVA revealed that there was a significant main effect for the across-group comparison ($F(3, 86)=14.397, p<0.05$) in the choice of local binding only. A post-hoc Tukey HSD comparison further revealed that there was a significant difference between the low-intermediate and the intermediate groups ($p<0.05$), between the low-intermediate and the advanced groups ($p<0.05$), between the low-intermediate and the English control groups ($p<0.05$), between the intermediate and the advanced groups ($p<0.05$), and between the intermediate and the English control groups ($p<0.05$). However no significant effect was found between the advanced and the English control groups ($p=0.780$). These results indicate that the acceptance of the local DP only in the low-intermediate group is significantly different from the intermediate, the advanced, and the English control groups. In addition, the performance of the intermediate group significantly differs from the advanced and the English control groups. However, the advanced group and the English control group behave similarly regarding their selection for the local antecedent in Type 2 structures. Remember that not only the advanced group but also the intermediate group showed a similar behaviour in Type 1 sentences. In this respect, the L2 speakers appear to distinguish Type 1 sentences from Type 2 sentences in the selection of the correct response, thereby showing an asymmetry between finite and non-finite clauses. Having considered the results regarding Type 1 and Type 2 sentences, a paired-sample *t*-test was used for the within-group comparison, as shown in Table 38.

Table 38: The comparisons between Type 1 and Type 2 sentences within groups

Sentence Type	Low-intermediate (n=19)			Intermediate (n=26)			Advanced (n=25)			English controls (n=20)		
	<i>M</i>	<i>SD</i>	<i>t</i>	<i>M</i>	<i>SD</i>	<i>t</i>	<i>M</i>	<i>SD</i>	<i>t</i>	<i>M</i>	<i>SD</i>	<i>t</i>
Type 1 (n=5)	4.26	0.87	3.745 <i>p</i> =0.001	4.73	0.67	2.757 <i>p</i> =0.011	4.92	0.28	2.753 <i>p</i> =0.011	5.00	0.00	1.000 <i>p</i> =0.330
Type 2 (n=5)	3.16	1.30		3.96	1.28		4.68	0.48		4.95	0.22	

All L2 groups showed a significant effect between Type 1 and Type 2 sentences ($p < 0.05$); in contrast, no significant difference was shown for the English control group ($p = 0.330$). This result shows that only the English control group handles Type 1 and Type 2 sentences in a similar fashion; but all three L2 groups do not treat these sentence types in the same way. It seems that L2 learners have more difficulty with reflexive binding when the sentence includes a non-finite clause. This result is not that surprising since similar findings have also been found in previous studies (e.g. Finer & Broselow 1986; Hirakawa 1990; Finer 1991; Matsumura 1994; Akiyama 2002; Jiang 2009).

Let us now examine the consistency of the participants in selecting only the appropriate local antecedent in Type 1 and Type 2 sentences, as shown in the following table. In evaluating the learner consistency, a score of 80% or above was taken as an indicator of successful knowledge of locality restrictions. Therefore, a participant had to take four correct answers out of five test items in order to be treated as having demonstrated nativelike knowledge of locality constraints. Obviously, this criterion is arbitrary but this study generally follows the consistency rates of previous studies.⁸⁸

⁸⁸ A few studies, such as Wakabayashi (1996), have considered the participants' responses to be consistently targetlike only if they correctly answer all sentences in the relevant type of structure. Many other studies (e.g. Thomas 1991, 1993; Yip & Tang 1998) have instead regarded as consistently targetlike those participants who responded correctly two out of three times or three out of four times for each relevant structure.

Table 39: Consistency rates with which a local antecedent was selected at least four out of five test items in Type 1 and Type 2 sentences.

Group	Type 1 (finite clauses)		Type 2 (non-finite clauses)	
	no.	%	no.	%
English controls (n=20)	20	100	20	100
Advanced (n=25)	25	100	25	100
Intermediate (n=26)	25	96.15	15	57.69
Low-intermediate (n=19)	15	78.95	10	52.63

The English control group and the advanced L2 group categorically rejected a long-distance antecedent in Type 1 and Type 2. The L2 learners exhibited a different distribution pattern from the English controls with the exception of the advanced learners. As seen in Table 39, while 78.95% of the low-intermediate learners and 96.15% of the intermediate learners rejected a non-local antecedent in Type 1, 52.63% of the low-intermediate learners and 57.69% of the intermediate learners did not permit a long-distance antecedent in Type 2 sentences. The low-intermediate and the intermediate learners showed high rates of correct response for Type 1 but poor rates for Type 2 sentences. That is, a clear asymmetry in the selection of the appropriate response between finite and non-finite clauses is observed in the intermediate and low-intermediate data, as is also shown in the group data.

We can see a progressive acquisition pattern in the response for local binding in Type 1 and Type 2 sentences which corresponds to the L2 learners' proficiency level. Based on these consistency data in the low-intermediate and the intermediate groups, it is evident that there is a significant amount of individual variation pertaining to the selection of the correct option in Type 1 and Type 2 sentences. This suggests that a significant number of learners may not have a targetlike syntactic representation of locality, contrary to the previous group results. As for Type 3 sentences, this study will not consider the consistency of the individual data among learners since their performance of Type 3 has already shown difficulty in dealing with pronoun-orientation (see Section 6.6.2).

6.6.2 Group results in orientation

Type 3 sentences were designed to test learners' knowledge of orientation restrictions in English. Recall that Type 3 structures permit either a subject or object antecedent for the English reflexive; so the option of both antecedents is a correct response. However, in Korean, only a subject antecedent is accepted for both types of reflexive (e.g. *caki-casin* and *caki*) in this sentence type. Although English native controls might be expected to select the 'both' option, given the absence of any orientation constraints in English, the controls chose a subject antecedent only 50% of the time and half of the responses were an object or both (subject/object) DPs as antecedents. Similar results for acceptance rates of ambiguous interpretations by English controls were also attested in previous studies such as Thomas (1991) and Yip & Tang (1998). Even lower preference rates for both subject/object binding were observed in some studies of Hirakawa (1990), Eckman (1994), and Wakabayashi (1996) (see Section 4.7.1). Nevertheless, the results for Type 3 sentences seem to demonstrate a clearly distinct pattern of responses for the English control group and the three L2 groups.

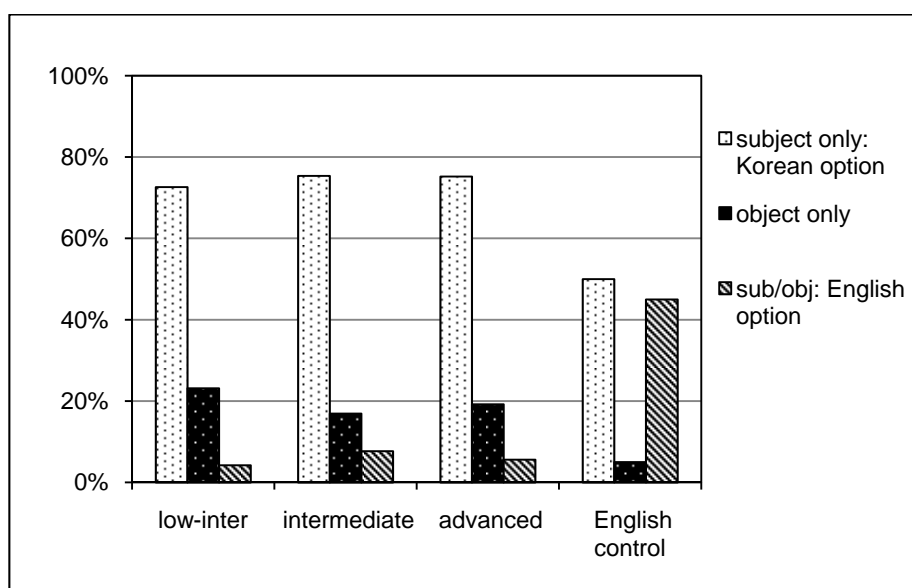


Figure 13: Across-group comparisons for percentages of target responses in orientation

While 45% of the English controls allowed the expected 'both' interpretations in Type 3 sentences, only 4.21% of the low-intermediate, 7.69% of the intermediate, and 5.6% of the advanced groups accepted this option. There was not even a consistent improvement

across groups with the L2 speakers' proficiency levels: 72.63% of the low-intermediate, 75.38% of the intermediate, and 75.2% of the advanced groups selected a subject antecedent only (see Figure 13). All three L2 groups yielded a significant distinction in performance between the subject DP and the object/both DPs ($p < 0.05$), whereas the English control group did not show a significant main effect between these options ($p = 1.00$) (see Table 40).

Table 40: The comparisons between subject antecedents and object/both (subject/object) antecedents in Type 3 sentences within groups

	Low-intermediate (n=19)			Intermediate (n=26)			Advanced (n=25)			English controls (n=20)		
	<i>M</i>	<i>SD</i>	<i>t</i>	<i>M</i>	<i>SD</i>	<i>t</i>	<i>M</i>	<i>SD</i>	<i>t</i>	<i>M</i>	<i>SD</i>	<i>t</i>
subject DP only	3.58	1.26	3.729 $p=0.002$	3.77	0.86	7.500 $p=0.000$	3.76	1.17	5.409 $p=0.000$	2.50	1.88	0.000 $p=1.000$
object/ both DPs	1.42	1.26		1.23	0.86		1.24	1.17		2.50	1.88	

Looking closely at the results of the option for the object antecedent only, each L2 group selected the option for object DP only more often than the correct option for both subject/object DPs. Even 5% of the English control group chose this option. Although this option is not a 'correct' response in either of the two languages, English reflexives can have an object antecedent in some contexts in English but not in Korean. Let us explore how the L2 speakers and the native controls responded to each test sentence in Type 3. Take the five test sentences as (3):

(3) Type 3 test sentences

- a. Miss Princess told Miss Curly about herself.
- b. Pinocchio asked Grandpa about himself.
- c. Cinderella showed Grandma a picture of herself.
- d. Mr. Hat showed Mr. Mask a reflection of himself in the mirror.
- e. Miss Princess gave Miss Curly a book about herself.

In Type 3, three of the five test sentences contained a 'picture-DP' kind without a possessor (e.g. sentences 3c, 3d, and 3e). Reflexives in the picture-DP category are

often thought to behave differently from other reflexives, and some have suggested that they are exempt from Condition A of the binding theory. Some authors such as Pollard & Sag (1992) and Reinhart & Reuland (1993) have claimed that they are not true reflexives governed by the binding theory but logophoric reflexives governed by independent factors (see Section 4.4.4). I follow Hicks (2009), who takes a neutral position, arguing that the picture-DPs not only satisfy the locality requirement for a locally bound reflexive, but also allow the presence of logophoric binding; essentially, a reflexive in this position is ambiguous between the two lexical items. The following table reports the participants' performance for each sentence in Type 3.

Table 41: Percentages of responses for the five test items in Type 3 sentences

Test item no.	Option	Low-inter. (n=19)	Intermediate (n=26)	Advanced (n=25)	English controls (n=20)
		%	%	%	%
3a	subject	78.94	88.46	88.00	55.00
	object	10.53	3.85	8.00	0.00
	both	10.53	7.69	4.00	45.00
3b	subject	78.94	92.30	76.00	30.00
	object	10.53	3.85	12.00	15.00
	both	10.53	3.85	12.00	55.00
3c	subject	78.94	76.92	84.00	65.00
	object	21.06	7.69	16.00	0.00
	both	0.00	15.39	0.00	35.00
3d	subject	31.58	26.92	32.00	35.00
	object	68.42	69.23	60.00	10.00
	both	0.00	3.85	8.00	55.00
3e	subject	94.74	92.31	96.00	65.00
	object	5.26	0.00	0.00	0.00
	both	0.00	7.69	4.00	35.00

Interestingly, there is no particular pattern in the responses of the three picture-DP sentences (sentence 3c, 3d, and 3e). This indicates that neither the native controls nor the L2 learners treated these reflexives differently from the local reflexives. For the L2 speakers, they strongly preferred subject binding across the test items except test sentence (3d), namely '*Mr Hat showed Mr Mask a reflection of himself in the mirror.*' Although there was no distinction in the learner data from picture-DPs to non-picture-DPs, a relatively high percentage of the L2 speakers interpreted *Mr Mask* (the object) as the antecedent of the reflexive. The marked distinction between sentence (3d) and all

the other test sentences was not borne out in the native control data. This result may be attributed to the effect of the particular design of the task as all three L2 groups chose a high percentage of the object antecedent for the same test item only. Previous studies examining the effects of the task design in the elicitation of binding responses (e.g. White et al. 1997) have also found that the certain type of truth-value judgment tasks used in the experiment can affect the rate of object antecedents elicited for both natives and L2 speakers.

A one-way ANOVA with scores of object/both binding as the dependent variable and scores of subject binding only as the independent variable was conducted to check an across-group comparison (note that there was a similar result of the across-group comparison in the selection of subject DP only in this sentence type). It revealed that there was a significant effect across groups ($F(3, 86)=4.950, p<0.05$). Further post-hoc Tukey HSD revealed that the acceptance of object/both bindings significantly differed between the English control group and the L2 groups: i) between the English control and the low-intermediate groups ($p<0.05$), ii) between the English control and the intermediate groups ($p<0.05$), and iii) between the English control and the advanced groups ($p<0.05$). However, no significant difference was observed between any of the L2 groups: i) between the low-intermediate and the intermediate groups ($p=0.963$), ii) between the low-intermediate and the advanced groups ($p=0.968$), and iii) between the intermediate and the advanced groups ($p=1.00$). This result indicates that all the L2 groups significantly prefer a subject DP as the antecedent in Type 3 structures, regardless of their proficiency level, in contrast to the behaviour of the English control group.

6.6.3 Summary of the group results in locality and orientation

To summarise the group results, the L2 learners presented an exclusive acceptance for the local antecedent only and a rejection of the nonlocal antecedent in Type 1 sentences. The scores of the intermediate and the advanced groups showed no significant difference from the English control group, but a significant difference was observed between the low-intermediate group and the English control group. As for Type 2 sentences, all the L2 groups demonstrated a high percentage of acceptance for local

binding, but the rates were not as high as the response for Type 1 sentences. Only the advanced group performed like the control group. The L2 speakers' performance between Type 1 and Type 2 sentences was significantly different from the English control group. All three L2 groups distinguished Type 1 from Type 2 sentences, but the English control group did not draw a contrast between these sentence types. These results show what appears to be an asymmetry between finite and non-finite sentences in English, in line with those of previous studies (e.g. *Finer & Broselow 1986; Hirakawa 1990; Finer 1991; Wakabayashi 1996; MacLaughlin 1998; Akiyama 2002; Jiang 2009*). Regarding Type 3 sentences, the L2 speakers showed a divergent performance from the English control group. Even though either a subject or object antecedent is allowed in this sentence type, the response pattern of three L2 groups in the selection of object/both DPs was distinct from the English control group. This study may conclude that acquiring the orientation condition for English reflexives remains a challenge to Korean L2 speakers even at advanced levels of proficiency.

Taken together with locality and orientation, the group results of the study show dissociation between the acquisition of locality and orientation constraints in English, which replicates findings from previous research (e.g. *Hirakawa 1990; Finer 1991; Eckman 1994; Thomas 1989, 1991, 1995; Wakabayashi 1996; Christie & Landolf 1998; Yip & Tang 1998; Yuan 1998*). Based on similar results, previous studies have argued that Korean (Chinese or Japanese) speakers of English have acquired English locality restrictions. However, I argue that although the L2 learners have shown a high percentage of the selection for the local DP in Type 1 and Type 2 structures, this study cannot confirm that their representation of L2 grammar coincides with the representation of English native speakers. Since Korean has two different kinds of reflexives (local/long-distance), learners can obtain locality even without reanalysis of new feature configurations (by means of L1 transfer). However, they should reanalyse their valued L1 features in order to achieve orientation. The L2 learners' choice on the local antecedent has arisen from their L1 local reflexive, which is independent from canonical binding relations. When learners successfully reconfigure new feature combinations of the English reflexives, both locality and orientation follow. Therefore, it is necessary to observe individual data of both locality and orientation in order to establish that the proposed feature-based reinterpretation of binding relations has in fact

taken place. As we have shown, the group results confirm the parallel findings of previous studies but do not contribute anything new to them. However, the individual results will reveal the most original and significant findings of the present study.

6.6.4 Individual results

Next, I examine the predictions regarding the acquisition patterns of locality and orientation constraints by individual learners. Since group results do not let us observe whether knowledge of locality co-occurs with knowledge of orientation in individual subjects (and also this is consistent with findings previously reported in the literature), the individual data represent the most unique empirical contribution. That is, the empirical study is designed to test at the individual level because the predictions in this study are only borne out by looking at individual results. In order for this, it is required to profile participants who have acquired both locality and orientation constraints, those who have acquired locality only, and those who have not acquired either restriction.

For the purposes of the individual analysis, this study has assumed that a learner has acquired locality only if a local antecedent is selected in at least four out of five tokens (80% acceptance rates) in Type 1 and Type 2 sentences. As for the analysis of the orientation results, this study decided not to take into consideration the rate of the target response of ‘both subject/object binding’ as only a few learners (21%) selected the expected option and never selected this option consistently over 40% of the time. Most of the learners chose either the ‘subject only’ option or the ‘object only’ option. Therefore, the analysis of the orientation data is based on the ‘subject only’ option. This study assumes that if L2 learners choose a subject antecedent for more than three out of five tokens (60% acceptance rates), their knowledge of pronoun orientation is influenced by their L1 since L1 Korean allows subject binding only. When they prefer a subject antecedent in less than 40% of the options (2 out of 5 tokens), a learner is treated as having acquired orientation. It should be noted that although 70% of the English controls chose the expected ‘both subject/object’ option at least once, only 7 of these native speakers (35%) chose this option over 80% of the time. This result makes it difficult to draw a direct comparison between the L2 learners and the controls’ individual responses for orientation. This study presents individual percentages of

locality and orientation responses for each group (see Appendices 9, 10, 11). In order to demonstrate each participant's behaviour regarding locality and orientation, I observed their performance, dividing them into six possible acquisition patterns, as shown in Table 42.

Table 42: Frequency and percentages of appropriate locality and orientation responses in six different acquisition contexts (note: '✓'= acquired/ '✗'= not acquired)

Acquisition pattern	Low-inter. (n=19)	Intermediate (n=26)	Advanced (n=25)	Total (n=70)
(1) ✓locality & ✓orientation	2 (10.5%)	2 (7.7%)	3 (12%)	7 (10%)
(2) ✓locality & ✗orientation	6 (31.6%)	13 (50%)	22 (88%)	41 (58.6%)
(3) ✓locality in finite only & ✗orientation	7 (36.9%)	10 (38.5%)	0 (0%)	17 (24.3%)
(4) ✓locality in non-finite only & ✗orientation	2 (10.5%)	0 (0%)	0 (0%)	2 (2.8%)
(5) ✗locality & ✓orientation	0 (0%)	0 (0%)	0 (0%)	0 (0%)
(6) ✗locality & ✗orientation	2 (10.5%)	1 (3.8%)	0 (0%)	3 (4.3%)

As previously discussed, the main prediction in this study is that the acquisition of English binding relations requires reconfiguring the mechanism of feature specification which is already predefined in the learners' L1 grammar. If L2 speakers have correctly acquired the new feature configuration for the English reflexive, they should show a nativelike performance in both locality and orientation constraints, which is consistent with the second prediction in Section 6.2.

In scenario (1) in Table 42, the data shows that only 7 learners out of 70 (10% of all L2 learners) have acquired both locality and orientation constraints. 10.5% of the low-intermediate learners (2 out of 19), 7.7% of the intermediate learners (2 out of 26), and 12% of the advanced learners (3 out of 25) show the acquisition of both locality and orientation. Only a few learners in each group exhibit the acquisition pattern where both locality and orientation are acquired. As a consequence, these data do not support the

second prediction where both locality and orientation are acquired (yet this possibility is at least available from the data). The vast majority of learners (85.7% in scenarios 2, 3, and 4) appear to possess targetlike knowledge of the locality condition, but persistent problems regarding the orientation constraint obtain at all three levels. This seems to run parallel to the data discussed in the group results. In the examination of the acquisition of locality constraints, I considered the possibility that clausal syntactic properties (finite or non-finite) might affect Korean speakers' selection of locality based on the previous findings and that their choices might be influenced by properties which are specific to each of these two clause structures. The present study therefore distinguished between those learners who correctly show targetlike knowledge of locality constraints in both finite and non-finite types (scenario 2), in finite clauses only (scenario 3), and in non-finite clauses only (scenario 4).

In scenario (2), 31.6% of the low-intermediate learners (6 out of 19), 50% of the intermediate learners (13 out of 26), and 88% of the advanced learners (22 out of 25) show the acquisition pattern for dissociation of 'locality before orientation'. In this acquisition pattern, there is a clear development as their proficiency level rises; in contrast, the number of learners who initially select the long-distance antecedent for the English reflexive decreases with proficiency. These individual data support the first prediction in which learners demonstrate a failure to acquire the orientation restriction without acquiring the locality restriction. Essentially, they use the feature specification for Korean local reflexives.

Next, in scenario (3), 36.9% of the low-intermediate learners (7 out of 19), 38.5% of the intermediate learners (10 out of 26), and none of the advanced learners show the acquisition pattern where locality is acquired in finite clauses only but orientation is not. Interestingly, only 10.5% of the low-intermediate learners (2 out of 19) and none of the intermediate and the advanced learners demonstrate the scenario (4) whereby locality is acquired in non-finite clauses only but orientation is not.

Taken together with scenarios (2), (3), and (4), it seems that the Korean L2 learners could be influenced by syntactic clausal properties such as finite and non-finite distinction in the acquisition of the locality constraint. However, the individual data show that different sentence types do not affect the advanced learners' responses since

all of the learners who chose the local DP option allow it in both finite and non-finite clauses. On the contrary, 50% of the intermediate learners select local antecedents in both finite and non-finite contexts (scenario 2) and 38.5% of speakers in this group also accept them in finite clauses only (scenario 3). Furthermore, a mixed behaviour has been shown by the low-intermediate learners; 31.6% of learners allow local DPs in both sentence types, 36.9% of learners in this group select local antecedents in finite only contexts, and 10.5% of speakers allow them in non-finite contexts only. These results suggest that the clausal type (finite or non-finite) is a main factor which influences the behaviour of the intermediate and low-intermediate learners. The intermediate and the low-intermediate learners suffer problems with L2 clausal syntax. This observation for the difficulties in selecting the correct response in non-finite clauses has already been discussed in *Finer & Broselow (1986)*, *Finer (1991)*, *Matsumura (1994)*, *Akiyama (2002)*, and *Jiang (2009)*. For instance, as noted in Chapter 4, *Finer & Broselow (1986)* claim that learners may have analysed the non-finite clauses as mono-clauses, so the first and second DPs may have been regarded as a subject and an object, respectively. *Finer (1991)* argues that L2 speakers handle non-finite contexts as double-object constructions, so that they allow an object DP as an antecedent. Subsequently, *Matsumura (1994)* also shows that learners have more problems in choosing the correct antecedent for the verb ‘want’ than for the verb ‘tell’ in non-finite clauses, suggesting that there may be a stage in the process of acquiring English clausal structures and the clause formed by an infinitive with specific verbs may not be properly perceived. In the individual data, the observed different clausal effect disappears when L2 speakers achieve an advanced proficiency level, as also shown in the participants’ consistency rates for the selection the local binding only in Table 39. This finding suggests that the lack of integration of other areas of syntactic knowledge with a target grammar, such as specific properties of English clausal syntax, could be a possible explanation. The observed different performance between the advanced and the intermediate learners is not captured by the group results presented in Figures 10 and 11 for the acquisition of locality.

Crucially, in scenario (5), the data supports the third prediction as none of the participants shows the acquisition pattern whereby orientation is acquired but locality is not. As discussed earlier, the acquisition of the orientation constraint essentially

involves an unvalued [VAR] feature of the English reflexives. If Korean L2 speakers of English successfully reanalyse the new feature specification found on the English reflexives, this possibility is not available. As a consequence, this prediction is borne out in the individual data.

In scenario (6), there are three learners (two low-intermediate, one intermediate) who have demonstrated a failure to acquire both locality and orientation constraints. This study suggested that L1 transfer takes place from the relevant feature of *caki-casin* rather than that of *caki* due to the morphological similarity between *caki-casin* and the English reflexives. Furthermore, as the L2 input in which English reflexives are locally bound seems to be robust, the feature of *caki* would be quickly rejected once learners realise this identical behaviour between *caki-casin* and the English reflexives. The scenario (6) in Table 42 evidently shows this position and exhibits transfer of *caki*. It is expected that if lower proficiency learners were involved in the test, this acquisition pattern would be found more often.

6.7 Summary and discussion

This section summarises the research findings and discusses them in relation to the new approach of the feature-based L2 acquisition of anaphor binding. The main objective of the L2 study of anaphoric binding was to investigate the question of whether L2 learners acquire the two constraints of binding properties in English. The answers to the research questions are supported by the results from the individual data. Below is a summary of the major findings of the experimental study in response to the research questions:

1. The Korean L2 speakers of English appear to support the first prediction that they may develop a targetlike performance in the locality constraint whilst showing persistent problems with orientation. 31.6% of the low-intermediate learners, 50% of the intermediate learners, and 88% of the advanced learners show the dissociation of ‘locality before orientation’. In total, 58.6% of the learners demonstrate this acquisition pattern.
2. Only 10.5% of the low-intermediate learners, 7.7% of the intermediate learners,

and 12% of the advanced learners show the acquisition of both locality and orientation constraints. In total, 10% of the learners exhibit this acquisition pattern. Consequently, these data do not support the second prediction where both locality and orientation are acquired.

3. None of the participants shows the pattern of acquisition represented in scenario 5 of Table 42, where orientation is acquired but locality is not. This finding is conformed to the third prediction.

With respect to the research questions at issue, the new feature-based approach predicts a learning difficulty due to the different binding mechanism available in each language. As presented in the picture verification task, L2 learners should change their binding configuration in accordance with the L2. Since behaviour of reflexives across languages involves independent mechanisms relevant to the feature specifications of different reflexives, learners face a challenge acquiring the new feature configuration in the target grammar. The binding mechanism regarding locality and orientation in English is instantiated by the Minimalist account of the operations of Agree due to the phase-based locality constraints, thus the properties of locality and orientation are expected to be simultaneously acquired. If L2 speakers successfully reanalyse the new binding mechanism that allows local binding to be achieved via Agree in English, they should manifest targetlike behaviour of both locality and orientation. If L2 speakers fail to reanalyse the new binding configuration in English, they should demonstrate non-targetlike behaviour of both locality and orientation constraints.

However, the result of the study shows that 85.7% of the learners (scenarios 2, 3, and 4) appear to have acquired locality but have not acquired orientation. Although this result appears to maintain the prediction that Korean L2 speakers of English acquire locality before orientation, this study proposes that in contrast to the findings of previous studies this is not the case. Instead, the results of the study suggest that L2 learners do not have knowledge of how binding properties of locality and orientation are organised in the target language. Under the feature-based reinterpretation of anaphoric binding proposed in this study, the L2 learners' targetlike performance on locality can be accounted for by L1 transfer. The binding mechanism operated in Korean (e.g. a valued [VAR] feature), which is different from that of English (e.g. an unvalued [VAR] feature), allows local

binding for separate reasons via reflexivisation of the local predicate (e.g. Cliticisation_{LF} to *v*), as outlined in full in Section 4.6. Therefore, I believe that these speakers could accept a local antecedent for English anaphors without changing the English value of the unvalued [VAR] feature by transferring the L1 valued [VAR] feature. By transferring their own L1 grammar for the locally bound Korean reflexive, the learners could achieve the same local antecedent in the L2. This different binding mechanism in terms of the value of the relevant features explains why learners still hold persistent L1 influence in their interlanguage grammar. This means that they have not successfully acquired the correct reflexivisation mechanism in English. Hence, they also fail to acquire the orientation constraint of English reflexives, since the Korean local reflexives are subject-oriented.

The important consequence of the feature-based approach is that, contrary to the locality constraint, only targetlike knowledge of orientation can be taken as evidence of successful acquisition of anaphor binding. That is, Korean speakers of English cannot demonstrate a targetlike performance on orientation constraints, provided that they have not reanalysed the appropriate reflexivisation feature. Indeed, the 58.6% of learners who show the pattern of acquisition represented in scenario 2 (locality is acquired but orientation is not) have not successfully acquired knowledge of binding constraints in English.

It is worth noting that although learners transfer their L1 into the L2, the majority of Korean speakers constantly reject a long-distance antecedent in English. In this regard, the transfer effect faces questions as to why learners do not transfer their L1 long-distance option and only transfer a local option. It is possible to assume that Korean speakers might regard the English reflexive ‘himself’ as similar to their L1 local reflexive *caki-casin* rather than *caki*. Lee (2001) points out that the binding behaviour of the English reflexive ‘himself’ is identical to that of the Korean local anaphor *caki-casin* for locality, and native speakers of Korean consulted translated ‘himself’ as *caki-casin* (see footnote 64 in Section 4.6.2). This morphological analogy between Korean and English reflexives might lead learners to select a local option and at the same time reject a long-distance one due to the robust L2 input. Moreover, there is a possibility that learners’ correct rejection of the long-distance antecedent particularly in finite clauses

might arise from the learners' other areas of the L2 grammar, such as clausal boundaries.

The second findings reported above demonstrate that the rate of the acquisition of both locality and orientation restrictions is very low, as only 10% of the learners have correctly rejected their L1 feature and successfully posited the target reflexive feature in order to construct the appropriate L2 feature configurations. The percentage is low but considerably important. Under the Feature Assembly Hypothesis (FAH) (Lardiere 2008, 2009) on the basis of the Full Transfer/Full Access (FT/FA) (Schwartz & Sprouse 1994, 1996), any failure to acquire a target grammar is not necessarily permanent. Given the fact that adult learners already have previous knowledge of a language-particular feature configuration of the relevant lexical items, the process of reconfiguration must be a challenge to L2 speakers. Nonetheless, it is anticipated that reconfiguration is attainable. The results in this study have shown that successful reanalysis of the [VAR] features by learners is eventually possible, although only seven learners tested showed evidence of this outcome. One consequence of this result is that locality as well as orientation is an area of persistent difficulty for Korean speakers of English, since only a few learners in each group demonstrate that they have correctly reanalysed the reflexive feature consistent with the L2 specifications. There was no gradual development across proficiency levels in supplying correct responses of both locality and orientation. This finding is in contrast to the results of previous research where binding properties are successfully acquired by mostly higher-level learners. This study also initially expected that the advanced L2 speakers behave more like native speakers. However, the finding in the current study suggests that learners throughout the proficiency levels have persistent problems in acquiring both locality and orientation constraints. Although L1 transfer leads the learners to take the same locality option in the target grammar, this in fact does not play any role in orientation.

It is important to note that L1 effects are not the only possible reason for the learners' divergent acquisition of anaphoric binding. The learners' non-nativelike behaviour can also be accounted for in terms of the lack of relevant L2 input. In this regard, Schwartz & Sprouse (1996: 42) place strong emphasis on the target input to trigger L2 acquisition (see Section 2.2.3.2), as follows:

[I]n brief, given that the starting point is not simply open (or set to learning-theoretically delearnable ‘defaults’), it may be that the L2 acquirer (L2er) will never be able to arrive at the TL grammar: either the data needed to force restructuring simply do not exist [...] or the positive data needed are highly obscure, being very complex and/or rare. This view can then account for (aspects of) fossilization in the L2 acquisition.

It could be assumed that the Korean speakers’ divergence from the target grammar is a consequence of the absence or infrequency of the relevant input data. The appropriate input that Korean L2 speakers encounter would be a sentence containing a local subject antecedent or a local object antecedent. This type of positive evidence may stimulate Korean L2 speakers to revise their L1 grammar towards the target grammar. Indeed, the L2 speakers seem to take evidence in the input which is mostly associated with a local subject antecedent. This type of input, however, is not sufficient to force the necessary reanalysis of features, as learners also need to be exposed to structures where the local antecedent is an object to confirm orientation (Domínguez, Hicks & Song 2012). In light of the absence of this type of L2 input, L2 speakers do not appear to acquire English binding properties appropriately, despite access to UG being fully available.

The feature-based approach also explains why none of the learners exhibits the acquisition pattern represented in scenario 5 of Table 42, where orientation is acquired but locality is not. This supports the third prediction from Section 6.2. As presented, the acquisition of either subject or object orientation in English inevitably involves positing the appropriate feature for the English reflexive (e.g. an unvalued [VAR] feature). If such a feature is constructed, the locality constraint is automatically acquired as well.

Finally, the findings in this study suggest that I cannot confirm the first prediction where locality is acquired before orientation. The most interesting conclusion from this study is the observation that even though learners show apparent acquisition of locality constraints, their representation of locality in English is not a consequence of the correct binding mechanism. This observed difficulty in acquiring anaphoric binding is attributed to problems reanalysing the appropriate features in the target language and the lack of appropriate L2 input, consistent with the predictions of the FAH (Lardiere 2008,

2009). The implications of current L2 acquisition theory regarding the FAH will be presented in Section 7.3.

CHAPTER 7

SUMMARY, IMPLICATIONS, AND CONCLUSION

The main objective of this thesis was to examine the role of UG in L2 acquisition by investigating the acquisition of two syntactic phenomena which share certain properties but which are assumed to have a different status in the grammar. In order to achieve this goal, I investigated grammatical knowledge of the OPC and reflexive binding by English speakers of Korean and Korean speakers of English, respectively. The goal of the study has allowed me to focus on the issue of whether adult L2 learners can achieve nativelike knowledge in the areas of pronoun binding and, more broadly, has offered insights into the development of L2 acquisition under the UG-based approach, which generativists have supported from the GB theory to the recent Minimalist approach. More specifically, this study explored the two general research questions presented in the introduction. This chapter now returns to these:

1. Do adult L2 speakers have full access to UG in acquiring abstract syntactic knowledge of the target grammar (e.g. the Overt Pronoun Constraint)?
2. Do adult L2 speakers successfully acquire relevant feature configurations of the target grammar (e.g. anaphoric binding)?

In order to respond the first question, a study of the OPC was conducted, under the assumption that the OPC is a principle of UG. For the investigation of the second research question, a study of reflexive binding was carried out, under the current Minimalist assumption that reflexive binding is determined by specific formal features. Recent theories of L2 acquisition, such as the ‘Full Access’ account (Schwartz & Sprouse 1994, 1996) and the current trend of the ‘Feature Assembly Hypothesis’(FAH) (Lardiere 2008, 2009), were introduced to account for the results of the experimental studies. The results were subsequently evaluated to what extent these hypotheses can explain the empirical data.

7.1 The study of the Overt Pronoun Constraint in L2 acquisition

7.1.1 Summary of findings

As discussed throughout the thesis, I have assumed that UG is the initial state of the innate faculty of language, and that language acquisition is mediated by UG which allows children to develop an adult grammar. Given that UG guides children in their L1 acquisition despite POS phenomena, the fundamental question in this study was to observe whether UG still plays a role in adult L2 acquisition. The consideration of the accessibility of UG in L2 acquisition arises from the underlying assumption that L2 speakers' interlanguage grammar is constrained by UG. This issue of access to UG has directed me to research one of the principles of UG, the OPC, which requires that Korean overt pronouns in the embedded clause cannot be bound to a QDP or a *wh*-word in the matrix clause. This universal constraint need not be learnt.

I examined L2 acquisition of overt and null pronouns pertinent to the OPC by English-speaking learners of Korean, and assessed the possibility of Full Access to UG, assuming the FT/FA hypothesis (Schwartz & Sprouse 1994, 1996). In addition, this study analysed and compared whether L2 speakers can successfully acquire the OPC in subject position as well as in object position. The OPC study presented experimental data collected from two L2 groups (intermediate and advanced) and a Korean control group using a co-reference comprehension task and a story-based translation task. The following points summarise the main findings of the OPC study.

1. Although certain properties that constrain the OPC in Korean are absent in English, a group of English-speaking learners of Korean showed grammatical knowledge of the OPC in both subject and object positions.
2. The L2 speakers' knowledge of the OPC can then be explained as a result of full access to UG. This does not mean that L1 influence is not a factor affecting the course of acquisition from early on, since the individual data demonstrated clear L1 effects.
3. While the two different proficiency groups exhibited a similar performance of

the OPC, the results of the individual data demonstrated progress across proficiency levels as well as learner variation.

4. The individual results revealed that some of the L2 learners violated the restriction of the OPC more in object position than in subject position.

7.1.2 Implications and limitations of the OPC study

The findings of the OPC study demonstrate that English speakers successfully achieve syntactic knowledge of the OPC, despite the fact that the OPC is a POS phenomenon. This outcome offers the most important evidence that the ‘Full Access’ account of the FT/FA makes the correct predictions for English learners of Korean. These results in fact replicate findings from previous studies which have shown convergent grammatical representations of the OPC in subject position, even across different levels of proficiency (e.g. Kanno 1997, 1998; Pérez-Leroux & Glass 1999; Lozano 2002; Marsden 2002a; Rothman & Iverson 2007a, b; Rothman 2009). However, the significant empirical contribution in this study is the examination of the OPC in object position. Assuming that the OPC is a universal constraint, this syntactic knowledge is expected to be operational in L2 speakers (given that a null object in Korean is also a *pro*), regardless of pronoun position. This prediction has been fully confirmed in the group data. Interestingly, the reported acquisition pattern has further observed on individual variation concerning the non-instantiation of the OPC particularly in object position by some learners (following a Chinese type of grammar, for instance). These learners show a grammar which has properties of neither the L1 nor L2 but that of Chinese, where the OPC is not instantiated in object position. Although their knowledge of the OPC does not represent properties of the L1 nor L2 but does occur in other languages, these learners’ interlanguage grammar is still UG-constrained (e.g. Finer & Broselow 1986; Finer 1991; Schwartz & Sprouse 1994, 1996; MacLaughlin 1998). As discussed, the type of evidence available to L2 speakers is crucial in order to construct L2 grammatical knowledge. Despite access to UG being fully available, divergent representations of the target grammar may be a consequence of the absence of positive evidence in the L2 which plays a significant role in successful L2 acquisition (see White 1989; Schwartz & Sprouse 1994, 1996; Schwartz 1998). However, it is not completely

clear what factors would lead them to such a different treatment in object position in the OPC contexts. Another interesting result is that linguistic competence for the L2 speakers is not identical to that of the native speakers. Although identical behaviour has not been made between the L2 groups and the control group in this grammatical area, it does not mean that UG is not accessible by L2 speakers. The observed pattern in acquiring the interpretive differences can be explained by full access to UG which leads to the L2 speakers' acquisition of the contrast between null and overt pronouns in quantifier-binding environments.

Overall, results from the OPC study provide an answer to the first research question where adult L2 speakers have full access to UG in acquiring abstract syntactic knowledge of the target grammar. Hence, in light of the present findings, this study concludes that although there is learner variation to some extent between participants across proficiency levels, English speakers of Korean acquire syntactic knowledge of the OPC.

The OPC study collected evidence of L2 grammatical competence across two different tasks in order to investigate L2 speakers' linguistic knowledge of a universal constraint. Testing only two L2 groups may not have been sufficient to reveal the whole pattern of development in the L2 acquisition of this phenomenon. It would be desirable to conduct experiments that not only involve highly advanced-level learners in order to provide learners' nativelike behaviour but also involve beginners to observe whether knowledge of the OPC is acquired from early on. Moreover, it would be worth examining whether English speakers learning other pro-drop languages such as Chinese obtain correct knowledge of the OPC. In particular, it would be interesting to investigate whether English-speaking learners of Chinese show an asymmetry of the OPC between subject and object pronouns (given that an object is a variable not a *pro*). The current study mainly observed a syntactically determined distribution of the OPC as the OPC structures are regulated by purely syntactic constraints. Although the use of null and overt pronouns appears to be sensitive to discourse/pragmatic factors, these conditions were not investigated in the present study. In this regard, future studies should address how discourse/pragmatic contexts affect L2 speakers' use of null/overt pronouns in Korean.

7.2 The study of the L2 acquisition of anaphoric binding

7.2.1 Summary of findings

In response to the second research question, this study examined data on the L2 acquisition of reflexive binding under the feature-based approach, focusing on the interaction of locality and orientation constraints by adult Korean-speaking learners of English. Empirical data were collected using a picture verification task from three L2 groups (low-intermediate, intermediate, and advanced) and an English control group.

One of the most relevant issues of this study was to examine whether L2 learners show the acquisition pattern of ‘locality before orientation’ (i.e. locality is acquired but orientations is not) which has extensively been reported in previous L2 studies of reflexive binding. Under the model of the parameterised binding principle (Manzini & Wexler 1987; Wexler & Manzini 1987), binding properties of locality and orientation are determined by two parameters, namely, the Governing Category Parameter (GCP) and the Proper Antecedent Parameter (PAP) respectively. Accordingly, L2 speakers have come across two different learning tasks for the GCP and the PAP in the acquisition of reflexive binding. However, previous research has failed to provide an appropriate account for the observed acquisition pattern. Therefore, this study proposed the feature-based analysis following the current Minimalist analysis (e.g. Hicks 2009) and this attempt made it possible to formally explain two constraints of locality and orientation from the binding mechanism. The essence of the feature-based approach to binding is that knowledge of orientation naturally arises once L2 speakers have acquired the binding mechanism in English. As a consequence, the acquisition pattern whereby locality before orientation is in fact analysed as evidence that L2 speakers have not acquired both locality and orientation constraints. This study argues that only cases where L2 speakers show nativelike knowledge of both locality and orientation restrictions demonstrate that L2 acquisition of anaphoric binding has taken place. The following points are the summary of the main arguments in the study of anaphoric binding.

1. According to the group results, the Korean L2 speakers of English seemed to show a targetlike performance on locality but a persistent problem with orientation was observed, which appears to be consistent with the established acquisition pattern of ‘locality before orientation’.
2. In order to examine the feature-based account, an investigation of the acquisition pattern of both locality and orientation constraints by individual learners was required. Unlike previous studies, the results of the individual data showed that learners’ targetlike behaviour of the locality constraint was in fact obtained through L1 transfer (e.g. the L1 valued [VAR: Reflexive] feature of the locally bound Korean reflexive *caki-casin* was transferred).
3. This finding was analysed as revealing that L2 learners have problems in acquiring both locality and orientation constraints. That is, most L2 speakers failed to reanalyse the [VAR] feature of the English reflexive. Only a few learners in each proficiency level acquired both locality and orientation constraints of binding properties (i.e. only these learners successfully reconfigured the feature specifications of the L2 by positing an unvalued [VAR] feature on the English reflexives).
4. The overall results fully confirmed the predictions of the Feature Assembly Hypothesis (FAH) (Lardiere 2008, 2009) which holds that persistent L2 learning problems lie in feature reconfiguration within the lexical items of the L2. In terms of this view, the L2 speakers should have trouble acquiring both locality and orientation constraints. Crucially, the result of this study turned out to be compatible with this point.

The study of anaphoric binding has presented an important step forward in verifying apparent nativelike behaviour of locality in L2 speakers. This result reveals that learners are, in principle, unable to reanalyse their L1 feature specifications as required in the L2. This new approach thus eliminates the possibility that locality and orientation constraints present different learning challenges to L2 speakers.

7.2.2 Implications and limitations of the study of anaphoric binding

The new feature-based approach to L2 acquisition of anaphoric binding is in an advantageous position over previous studies, as this study can keep up with recent changes in syntactic theory of the Minimalist Program alongside with the conception of UG that currently dominates in generative linguistics. This study is probably the first to examine the acquisition of anaphoric binding in English as a second language within the feature-based approach of the MP framework (again it is acknowledged that a journal paper presented here has been published in *Language Acquisition* co-authored with Domínguez and Hicks). In this analysis, different languages show a different behaviour in their use of locality and orientation restrictions, such as the value of the feature which is responsible for deriving reflexive interpretations in each language. For example, locality conditions occur independently in Korean *caki-casin* due to the cliticisation to a local predicate and in English reflexives due to the phase-based locality constraints on Agree. Similarly, subject orientation occurs independently in *caki* due to topic-binding and in *caki-casin* due to the cliticisation at LF to a predicate head. The feature-based binding mechanism in English derives non-subject orientation through the syntactic referential dependency (Agree). As a consequence, the theory of binding as syntactic principles can be eliminated. Apart from the advantage of the theory itself, this kind of analysis has also made it possible to predict the different patterns of acquisition of English reflexives, and has shown that the predictions about the routes of acquisition regarding locality and orientation constraints are fully confirmed.

The data of locality and orientation obtained from the L2 speakers' performance turns out to be relative to robust L1 effects on L2 acquisition of reflexive binding, and this points to the learners' reconfiguration problems in interlanguage grammar. This failure to reanalyse the value of the target features explains why only a few learners show targetlike knowledge of both locality and orientation constraints, but also why most of the learners seem to posit the reflexivisation mechanism which is available in their L1 into English. Importantly, none of the L2 speakers in this study demonstrates the successful acquisition of orientation without the acquisition of locality. Although only seven learners (10% of all learners) exhibited target knowledge of both locality and orientation constraints, it is important to note that the acquisition of reflexive binding is

ultimately possible. These seven learners correctly demonstrated nativelike behaviour in both locality and orientation constraints, implying that adult L2 speakers can eventually reconfigure the relevant target features. The low rate of correct responses manifested by the acquisition of both locality and orientation restrictions even at advanced levels of proficiency suggests that L2 learners' difficulties with reflexive binding arise from a failure to reconfigure the reflexive features to meet the appropriate L2 specifications. As predicted by the hypothesis, L2 learners undergo learning difficulties due to the reanalysis of features, and consequently it may take a long time to achieve complete L2 competence in this domain. Although both locality and orientation constraints are eventually acquirable according to the assumption of the FAH (i.e. reconfiguration is possible), it is not completely clear when L2 learners are able to achieve a nativelike success of anaphoric binding and what conditions are further required for the mastery of these syntactic constraints (i.e. successful reconfiguration).

Overall, results from the study of anaphoric binding offer a possible answer to the second research question where adult L2 speakers do not successfully acquire relevant feature configurations of the target grammar. That is, they do not acquire binding properties of locality and orientation in a nativelike fashion. This outcome has been interpreted as an indication that L2 learners' knowledge of locality and orientation constraints is divergent from that of native speakers'. This finding lends support to the current perspective of the FAH, according to which L2 learners' learning task is characterised as a reconfiguration of the new feature specifications.

There are some limitations for the binding study with regard to its methodology and applications. First of all, this study only used a picture verification task, even though I was aware of its limitations. As discussed, a story-based truth-value judgment task was piloted, but it revealed that the task was too demanding for the L2 participants. Moreover, one of the greatest challenges to the story task was to design appropriate pragmatically felicitous stories which might be awkward in a natural conversational context, and consequently it was discarded. It would be worthwhile to supplement this with other tasks, such as a modified story-based picture task, in order to provide evidence of learners' difficulties of feature reconfiguration. The findings of this study demonstrated that learners' divergent behaviour in binding is indeed related to L1

properties. The cross-linguistic difference in anaphoric binding is explained via the different kind of mechanism used in each language. Therefore, comparisons between different L1 groups would be useful to elucidate whether L1 effects result in non-convergence on the target grammar. It would also be worth examining different L1–L2 pairs. Further investigation with opposite learning environments of reflexive binding (i.e. L1 English – L2 Korean) may provide insightful understanding of anaphoric binding. I leave these possibilities for further research; future studies will provide more precise insights into the nature of the divergent adult L2 acquisition and address the question as to whether non-targetlike L2 acquisition is due to the independent morphosyntactic competence between L1 and L2 systems involving a different kind of feature configurations.

7.3 Implications for current L2 acquisition theory

The results of the study exploring anaphor binding under the new feature-based approach present a challenge to some previous theoretical approaches to L2 acquisition. As discussed in Chapter 2, the parameter resetting approaches in adult L2 acquisition including the two opposing positions of the Failed Functional Features Hypothesis (FFFH) (Hawkins & Chan 1997) and the Full Transfer/Full Access (FT/FA) hypothesis (Schwartz & Sprouse 1994, 1996) claim that L2 speakers' point of departure in L2 acquisition is L1-based representations involving functional categories and associated features. However, learners' native language plays a different role in these parameter resetting approaches. One, the FFFH, claims that L2 acquisition is determined by formal features instantiated in the L1. That is, uninterpretable features which are not selected in the L1 are not available following the critical period and thus acquiring new features is expected to be unattainable. Hence, successful L2 acquisition is determined by the presence of the relevant features (e.g. uninterpretable features) of the L1. The other position, the FT/FA model, argues that a whole set of L1 functional features continue to be available to L2 learners during the course of acquisition, and that L1 effects disappear after sufficient exposure to L2 input. These two approaches to L2 acquisition have a different perspective on the role of L1 knowledge in relation to the availability of new functional features as well as possible outcomes. Although the FFFH differs from

the FT/FA hypothesis in that the L1 role in L2 acquisition is permanent despite available positive L2 input, these two approaches share the view that cross-linguistic variation among languages can be characterised in terms of the absence or presence of certain parameterised features or values.

The feature-based account, however, predicts that the source of differences between the L1 and the L2 is based on how the same features can be assembled in different ways in each language (Lardiere 2008, 2009). Accordingly, learners may have difficulty in reconfiguring feature specifications due to the different combinations of the lexical items between languages. The study of anaphoric binding presented here has observed that the L1 influence has remained throughout the acquisition path in this study. In terms of the role of the L1, the Feature Assembly Hypothesis (FAH) specifically offers an alternative account of the continuous L1 influence by characterising the organisation of relevant features in each language. However, the FFFH predicts learners' inability to access a new feature (i.e. an uninterpretable feature) that is not activated in the L1, and thus the absence of a particular feature in the L1 is assumed to be a source of L2 speakers' divergent target grammar. The FFFH might predict that Korean speakers of English would fail to acquire an unvalued [VAR] feature of the English reflexive in the L2. Since Korean has a valued [VAR: Topic] feature for *caki* (or a valued [VAR: Reflexive] feature for *caki-casin*), L2 speakers are predicted to encounter difficulties with an unvalued L2 feature that is not present in their L1. However, as discussed in full in Chapter 4, unlike the mechanism for reflexive binding in English, nonlocal Korean reflexives are not derived syntactically through feature checking or feature valuation. Instead, nonlocal Korean reflexives are driven by a semantic variable-binding mechanism at LF. As a consequence, this study proposes that language-specific behaviour of reflexives can be accounted for a different kind of mechanism available in each language. The FFFH mainly concentrates on the acquisition of an uninterpretable feature which is considered to determine parametric differences across languages. The study of anaphoric binding, however, is not a matter of the presence or absence of uninterpretable features between the L1 and the L2. Importantly, the FFFH does not provide a full explanation for the learning task (e.g. reanalysis of the feature specifications) faced by Korean speakers acquiring properties of reflexive binding in English.

In order to account for the dissociation pattern observed in the L2 acquisition of reflexive binding, the current feature-based approach (Hicks 2009) has been proposed, as hinted at by the FAH. On this approach, the L2 participants come to the learning task with a full range of L1 properties of anaphoric binding in which valued [VAR] features have been selected and assembled in a language-specific way. Therefore the learners' task is to assign an appropriate value specification for the [VAR] feature for the L2 by reconfiguring the existing features in their L1. That is, the task of Korean-speaking learners of English is not just to change the type of feature value (i.e. selection of the parameterised feature value), but to reconfigure feature specifications of the L2 as required for the target language. The current study of reflexive binding highlights the observed problems in reanalysing the configuration of the [VAR] feature for the L2. In the case of Korean speakers of English, L1 transfer (e.g. the [VAR: Reflexive] feature which is responsible for the local reflexive *caki-casin* in Korean) into English can explain why these speakers do not fully acquire binding properties of locality and orientation, even though they show apparently targetlike behaviour regarding locality constraints. Since the participants in this study have not reanalysed the accurate feature specifications in the L2, they could not exhibit nativelike behaviour concerning anaphoric binding in English.

As previously discussed in Section 6.7, L1 transfer is not the only possible explanation for the learners' delay in acquiring English binding restrictions appropriately. The type of input that learners use to acquire binding effects in English is mostly provided by a structure where anaphor is associated with a local subject antecedent (see Domínguez, Hicks & Song 2012). The lack of evidence that long-distance binding is possible in English would be quite robust as well. However, this type of input cannot be used to confirm orientation, as learners would also need to have access to a structure where the local antecedent is an object. It is possible to assume that Korean speakers may not frequently receive instances of reflexives bound by objects in the input, compared with reflexives bound by subjects. Lack of access to this kind of evidence may play a crucial role in explaining why Korean speakers do not appear to acquire the correct mechanism for anaphoric binding in the target grammar (for a detailed discussion on the role of positive evidence, see White 1989; Schwartz & Sprouse 1994, 1996; Lardiere 2009).

The study of reflexive binding presented here has provided a possible account for L2 learners' divergent syntactic behaviours of binding properties concerning locality and orientation constraints due to the observed ongoing L1 influence in the developmental route of L2 acquisition. The Korean-speaking learners' prior feature specification which is already defined in their L1 can be ascribed to the failure of its reconfiguration into the L2. According to Lardiere (2008, 2009), specific learning problems are encountered when the assembly of features and their conditioning environments differ between the L1 and the L2. As highlighted by Lardiere (2009: 215):

[t]he greater difficulty for the second language acquirer lies in assembling just the right combination of features into the right lexical items for each language and in determining the appropriate conditioning environments for their expression. This is especially so in cases where such features (interpretable or uninterpretable) do exist in the L1 but are configured differently, and/or expressed under different contextual conditions, including pragmatically-governed ones.

From the point of view of the FAH, the cause of non-convergent target grammar arises from L2 speakers' morphological competence involving different configurations of formal features associated with relevant morphological or phonological factors between the L1 and the L2. Lardiere (2008, 2008) also argues that the FAH should be attested in complex mapping constructions and show distinct L1 effects. Therefore, more studies should be carried out with various structural environments such as phonological, morphosyntactic, semantic or discourse contexts, and should investigate how differently constructed language-specific lexical items between L1 and L2 grammar affect the route of adult L2 acquisition.

7.4 Conclusion

In conclusion, the purpose of this thesis was to investigate L2 speakers' grammatical competence of pronominal binding in order to develop our understanding of the role of UG in L2 acquisition. The issues related to UG accessibility have been essential to explain how languages are acquired; particularly, this approach has been useful to

account for arguments of the poverty-of-the-stimulus (POS) in language acquisition. In this respect, the OPC study provided a concrete case for the availability of UG for L2 acquisition. The emphasis of access to UG, however, has shifted towards UG-accessible features with a postulation of Minimalist views of grammar. Minimalism provides a theory where a reflexive is not determined by a principle of UG but by syntactic operations on its features within the computational component of the grammar. It does not provide such a theory to explain OPC effects, thus this study retains the assumption that the OPC is instantiated by a UG principle.

These two syntactic phenomena of the OPC and anaphoric binding which appear to be regulated by different mechanisms within the grammar allowed for a comprehensive analysis of convergence and divergence in L2 acquisition. Most importantly, it allowed for a more precise identification of the nature of L2 speakers' learning task. Two different studies in this thesis demonstrate new evidence that while English learners of Korean have access to UG regarding knowledge of the OPC in both subject and object positions, Korean learners of English have failed in reanalysing relevant features of anaphoric binding. These results fully confirm the predictions about the pattern of acquisition of pronominal binding. For instance, the L2 speakers' learning process in the OPC study is expected to be unproblematic in accordance with Full Access to UG of the FT/FA hypothesis (Schwartz & Sprouse 1994, 1996), whereas the Feature Assembly Hypothesis (Lardiere 2008, 2009) predicts great difficulty acquiring both locality and orientation constraints of reflexive binding. These findings suggest that L2 speakers not only manifest targetlike knowledge with respect to principles of UG, but show non-targetlike knowledge in cases where the feature-based language-specific constraints are involved.

Further research is required in order to find out whether the results from this study can be replicated and generalised in other linguistic phenomena. I believe that the present findings of this thesis contribute to our understanding of the nature of the language faculty in general and the established L2 acquisition theories specifically.

Appendices

Appendix 1: Language background information for the task of the OPC

1. Name: _____

2. Gender: ☐ Female ☐ Male

3. Age: ☐ under 25 ☐ 25-35 ☐ 35-45 ☐ over 45

4. What is your native language? ☐ English ☐ Korean ☐ other (state which) _____

5. How long have you been studying Korean?

☐ under 1 year ☐ 1-2 years ☐ 2-3 years ☐ 3-4 years ☐ 4-5 years ☐ over 5 years

If you have been studying more than 5 years, please indicate years. _____

6. Have you lived in Korea? ☐ Yes ☐ No

If so, for how long?

☐ under 1 year ☐ 1-2 years ☐ 2-3 years ☐ 3-4 years ☐ 4-5 years ☐ over 5 years

If you have lived in Korea more than 5 years, please indicate years. _____

7. What language courses have you taken?

in Korea _____

in the UK _____

8. Please list any other foreign languages you have studied, in addition to Korean.

9. E-mail address (if you wish to know the results of this study):

Appendix 2: The co-reference comprehension task for the study of the OPC

Directions:

There are 36 items in this section and each item consists of two questions. Please read the following sentences and choose an answer which you feel is appropriate by ticking 'YES' or 'NO'. Please do not spend too much time on each item and do not go back to change your answers. Double YESes or NOs might be possible in each question. Here are some examples in English and Korean. If there is any vocabulary that you do not understand, please feel free to ask.

Examples:

- i) She said that Ben will wash the dishes after dinner.

Q: Who do you suppose will wash the dishes after dinner?

a. Could it be the same person as '*She*'? ☐ YES ☐ NO

b. Could it be another person ('Ben' in this case)? ☐ YES ☐ NO

- ii) He told Mary to write him a letter.

Q: Who do you suppose Mary should write a letter to?

a. Could it be the same person as '*He*'? ☐ YES ☐ NO

b. Could it be someone else (e.g. Peter)? ☐ YES ☐ NO

- iii) 그녀는 제인이 서울에 갔다고 말했습니다.

문제: 누가 서울에 갔습니까? (Who do you suppose went to Seoul?)

a. Could it be the same as '*그녀*'? ☐ YES ☐ NO

b. Could it be another person? ☐ YES ☐ NO

- iv) 헬렌은 세라가 피터를 좋아한다고 말했습니다.

문제: 세라는 누구를 좋아합니까? (Who do you suppose Sarah likes?)

a. Could it be '*헬렌*'? ☐ YES ☐ NO

b. Could it be someone else who is not '*헬렌*'? ☐ YES ☐ NO

Start task

1. 누군가가 그녀가 런던에 살았다고 말했습니다.

문제: 누가 런던에 살았습니까? (Who do you suppose used to live in London?)

- a. Could it be the same as ‘누군가’? ☐ YES ☐ NO
b. Could it be another person? ☐ YES ☐ NO

2. 누가 메리가 그를 사랑한다고 말했습니까?

문제: 메리는 누구를 사랑합니까? (Who do you suppose Mary loves?)

- a. Could it be the same as ‘누가’? ☐ YES ☐ NO
b. Could it be another person? ☐ YES ☐ NO

3. 피터는 그가 반에서 가장 똑똑하다고 생각합니다.

문제: 누가 반에서 가장 똑똑하다고 생각합니까?

(Who do you suppose is the smartest in the class?)

- a. Could it be ‘피터’? ☐ YES ☐ NO
b. Could it be someone else who is not ‘피터’? ☐ YES ☐ NO

4. 누가 오늘 리포트를 쓸 것이라고 말했습니까?

문제: 누가 오늘 리포트를 쓸 것입니까?

(Who do you suppose will write a report today?)

- a. Could it be the same as ‘누가’? ☐ YES ☐ NO
b. Could it be another person? ☐ YES ☐ NO

5. 모두는 세라가 보러올 것이라고 생각합니다.

문제: 세라는 누구를 보러올 것입니까?

(Who do you suppose Sarah will come to see?)

- a. Could it be the same as ‘모두’? ☐ YES ☐ NO
b. Could it be another person? ☐ YES ☐ NO

6. 피터는 톰이 자주 괴롭힌다고 말했습니다.

문제: 톰은 자주 누구를 괴롭힙니까?

(Who do you suppose Tom irritates frequently?)

- a. Could it be 피터? ☐ YES ☐ NO
- b. Could it be someone else who is not ‘피터’? ☐ YES ☐ NO

7. 누가 그가 내일 테니스를 칠 것이라고 말했습니까?

문제: 누가 내일 테니스를 칠 것입니까?

(Who do you suppose will play tennis tomorrow?)

- a. Could it be the same as ‘누가’? ☐ YES ☐ NO
- b. Could it be another person? ☐ YES ☐ NO

8. 세라는 제인이 그녀를 학교에서 픽업할 것이라고 말했습니다.

문제: 제인은 학교에서 누구를 픽업할 것입니까?

(Who do you suppose Jane is going to collect from the school?)

- a. Could it be ‘세라’? ☐ YES ☐ NO
- b. Could it be someone else who is not ‘세라’? ☐ YES ☐ NO

9. 누군가가 지갑을 잃어버렸다고 신고했습니다.

문제: 누가 지갑을 잃어버렸습니까? (Who do you suppose lost the wallet?)

- a. Could it be the same as ‘누군가’? ☐ YES ☐ NO
- b. Could it be another person? ☐ YES ☐ NO

10. 모두는 그가 지난밤에 축구경기를 보았다고 말했습니다.

문제: 누가 지난밤에 축구경기를 보았습니까?

(Who do you suppose watched football last night?)

- a. Could it be the same as ‘모두’? ☐ YES ☐ NO
- b. Could it be another person? ☐ YES ☐ NO

11. 누군가가 피터가 놀이터에서 그를 놀렸다고 말했습니다.

문제: 피터는 놀이터에서 누구를 놀렸습니까?

(Who do you suppose Peter teased in the playground?)

- a. Could it be the same as ‘누군가’? ☐ YES ☐ NO
b. Could it be another person? ☐ YES ☐ NO

12. 피터는 톰이 그를 쉽게 찾을 수 있다고 믿었습니다.

문제: 톰은 누구를 쉽게 찾을 수 있습니까?

(Who do you suppose Tom is able to find easily?)

- a. Could it be ‘피터’? ☐ YES ☐ NO
b. Could it be someone else who is not ‘피터’? ☐ YES ☐ NO

13. 누군가가 다시는 운전을 하지 않겠다고 말했습니다.

문제: 누가 다시는 운전을 하지 않겠다고 합니까?

(Who do you suppose would never drive again?)

- a. Could it be the same as ‘누군가’? ☐ YES ☐ NO
b. Could it be another person? ☐ YES ☐ NO

14. 세라는 어제 아팠다고 말했습니다.

문제: 누가 어제 아팠습니까? (Who do you suppose was ill yesterday?)

- a. Could it be ‘세라’? ☐ YES ☐ NO
b. Could it be someone else who is not ‘세라’? ☐ YES ☐ NO

15. 누가 그녀가 런던으로 이사한다고 말했습니까?

문제: 누가 런던으로 이사합니까? (Who do you suppose will move to London?)

- a. Could it be the same as ‘누가’? ☐ YES ☐ NO
b. Could it be another person? ☐ YES ☐ NO

16. 모두는 메리가 그녀를 좋아하게 될 것이라고 믿었습니다.

문제: 메리는 누구를 좋아하게 될 것입니까?

(Who do you suppose Mary is going to like?)

- a. Could it be the same as ‘모두’? ☐ YES ☐ NO
b. Could it be another person? ☐ YES ☐ NO

17. 메리는 소피가 카페에서 때렸다고 말했습니다.

문제: 소피는 카페에서 누구를 때렸습니까?

(Who do you suppose Sophie punched in the café?)

- a. Could it be ‘메리’? ☐ YES ☐ NO
- b. Could it be someone else who is not ‘메리’? ☐ YES ☐ NO

18. 누가 메리가 해고했다고 말했습니까?

문제: 메리는 누구를 해고했습니까? (Who do you suppose Mary fired?)

- a. Could it be the same as ‘누가’? ☐ YES ☐ NO
- b. Could it be another person? ☐ YES ☐ NO

19. 모두는 시험에 떨어질 것 같다고 말했습니다.

문제: 누가 시험에 떨어질 것 같습니까?

(Who do you suppose would fail the exam?)

- a. Could it be the same as ‘모두’? ☐ YES ☐ NO
- b. Could it be another person? ☐ YES ☐ NO

20. 누군가가 헬렌이 겨울에 방문할 것이라고 말합니다.

문제: 헬렌은 겨울에 누구를 방문할 것입니까?

(Who do you suppose Helen will visit in the winter?)

- a. Could it be the same as ‘누군가’? ☐ YES ☐ NO
- b. Could it be another person? ☐ YES ☐ NO

21. 메리는 오늘밤 기타를 연주할 것이라고 말했습니다.

문제: 누가 오늘밤 기타를 연주할 것입니까?

(Who do you suppose will play the guitar tonight?)

- a. Could it be ‘메리’? ☐ YES ☐ NO
- b. Could it be someone else who is not ‘메리’? ☐ YES ☐ NO

22. 모두는 그가 내일 은행에 갈 것이라고 말했습니다.

문제: 누가 내일 은행에 갈 것입니까?

(Who do you suppose will go to the bank tomorrow?)

- a. Could it be the same as ‘모두’? ☐ YES ☐ NO
b. Could it be another person? ☐ YES ☐ NO

23. 누가 제인이 그녀를 아침에 깨웠다고 말했습니까?

문제: 제인은 아침에 누구를 깨웠습니까?

(Who do you suppose Jane woke up in the morning?)

- a. Could it be the same as ‘누가’? ☐ YES ☐ NO
b. Could it be another person? ☐ YES ☐ NO

24. 누군가가 제인이 역에서 기다리고 있었다고 말했습니다.

문제: 제인은 역에서 누구를 기다리고 있었습니까?

(Who do you suppose Jane was waiting for in the station?)

- a. Could it be the same as ‘누군가’? ☐ YES ☐ NO
b. Could it be another person? ☐ YES ☐ NO

25. 존은 피터가 럭비 경기중 걷어찼다고 불평했습니다.

문제: 피터는 럭비경기중 누구를 걷어찼습니까?

(Who do you suppose Peter kicked in the rugby match?)

- a. Could it be ‘존’? ☐ YES ☐ NO
b. Could it be someone else who is not ‘존’? ☐ YES ☐ NO

26. 모두는 홈즈씨 (Mr. Holmes)가 심문하였다고 말했습니다.

문제: 홈즈씨는 누구를 심문하였습니까?

(Who do you suppose Mr. Holmes interrogated?)

- a. Could it be the same as ‘모두’? ☐ YES ☐ NO
b. Could it be another person? ☐ YES ☐ NO

27. 소피는 메리가 그녀를 안심시켰다고 말했습니다.

문제: 메리는 누구를 안심시켰습니까? (Who do you suppose Mary assured?)

- a. Could it be ‘소피’? ☐ YES ☐ NO
b. Could it be someone else who is not ‘소피’? ☐ YES ☐ NO

28. 모두는 어제 시험 공부를 했다고 말했습니다.

문제: 누가 어제 시험 공부를 했습니까?

(Who do you suppose studied for the test yesterday?)

- a. Could it be the same as ‘모두’? ☐ YES ☐ NO
b. Could it be another person? ☐ YES ☐ NO

29. 누군가가 제인이 런던으로 그녀를 따라갔다고 말했습니다.

문제: 제인은 런던으로 누구를 따라갔습니까?

(Who do you suppose Jane followed to London?)

- a. Could it be the same as ‘누군가’? ☐ YES ☐ NO
b. Could it be another person? ☐ YES ☐ NO

30. 존은 사무실을 청소했다고 말했습니다.

문제: 누가 사무실을 청소했습니까? (Who do you suppose cleaned the office?)

- a. Could it be ‘존’? ☐ YES ☐ NO
b. Could it be someone else who is not ‘존’? ☐ YES ☐ NO

31. 누군가가 그가 새 차를 살 것이라고 말했습니다.

문제: 누가 새 차를 살 것입니까?

(Who do you suppose is going to buy a new car?)

- a. Could it be the same as ‘누군가’? ☐ YES ☐ NO
b. Could it be another person? ☐ YES ☐ NO

32. 메리는 그녀가 어제 병원에 갔다고 말했습니다.

문제: 누가 어제 병원에 갔습니까?

(Who do you suppose went to the hospital yesterday?)

- a. Could it be ‘메리’? ☐ YES ☐ NO
b. Could it be someone else who is not ‘메리’? ☐ YES ☐ NO

33. 모두는 토마스가 그를 존경하다고 말했습니다.

문제: 토마스는 누구를 존경합니까? (Who do you suppose Thomas respects?)

- a. Could it be the same as ‘모두’? ☐ YES ☐ NO
b. Could it be another person? ☐ YES ☐ NO

34. 누가 제인이 펍에서 때렸다고 말했습니까?

문제: 제인은 펍에서 누구를 때렸습니까?

(Who do you suppose Jane hit in the pub?)

- a. Could it be the same as ‘누가’? ☐ YES ☐ NO
b. Could it be another person? ☐ YES ☐ NO

35. 소피는 그녀가 좋은 사람이라고 말했습니다.

문제: 누가 좋은 사람입니까? (Who do you suppose is a good person?)

- a. Could it be ‘소피’? ☐ YES ☐ NO
b. Could it be someone else who is not ‘소피’? ☐ YES ☐ NO

36. 누가 파티에 일찍 왔다고 말했습니까?

문제: 누가 파티에 일찍 왔습니까? (Who do you suppose came early to the party?)

- a. Could it be the same as ‘누가’? ☐ YES ☐ NO
b. Could it be another person? ☐ YES ☐ NO

Appendix 3: The story-based translation task for the study of the OPC

Directions:

Please read the following sentences and you will find a sentence that appears in *italics*.

Please **translate** this into Korean, and do not spend too much time on each sentence.

Please note that you do not have to translate word by word; instead, try to translate the given sentence with the most natural style.

The translation is prompted by providing the first word(s) and is ended by providing the verb of the main clause to be translated. If there is any vocabulary that you do not understand, please feel free to ask.

Start task

1. All the students took the English exam on Monday.

However, the teacher told the students that she had lost the test paper mark sheet.

The students also did not know their marks because they gave in their test papers.

Q: Did anyone know the marks?

A: *No, everyone said that he did not know his marks.*

아니요, 모두는

말했어요.

2. Sophie used to have painting lessons at school. She often visited art galleries.

Nevertheless, many friends said that Sophie's painting was not good.

Q: What did Sophie's friends say about Sophie's painting?

A: *Many friends said that she was not good at painting.*

많은 친구들은

말했어요.

3. Each of my children gets £1 per week from their dad. That's the only money they get. However, my children always complain about their small amount of pocket money.

Q: Do the children say that they have got enough money?

A: *No, each child says that he wants more money.*

아니요, 각각의 아이는

말해요.

4. During the school holidays, my teenage daughter and son spend most of their mornings asleep in bed. I think they are extremely lazy.

Every one of my friends advised me to wake them up early in the morning.

Q: Did anyone say that I should let them sleep more in the morning?

A: *No, everyone said that I should wake them up early in the morning.*

아니요, 모두는

말했어요.

5. The head teacher has announced that everyone in the school has the chance to learn how to swim. All the parents think that the head teacher is enthusiastic about the children's learning.

Q: What do parents reckon about the head teacher?

A: *Every parent reckons that he is a conscientious teacher.*

모든 부모는

생각해요.

6. Fans who bought tickets for Michael Jackson's tour are allowed to ask for their money back following Michael Jackson's death. However, fans can choose between cash or tickets which are specially designed. Every fan in Peter's school wants to get tickets rather than cash, because the tickets can be kept as a tribute for Michael Jackson.

Q: Does any fan want to get their money back in Peter's school?

A: *No, each fan says that he wants to receive a ticket.*

아니요, 각각의 팬은

말해요.

7. Korean Journalist Sarah Kim has worked in several different countries. She investigated the power of the press around the world; consequently, she was awarded a special prize in Broadcast Media. Many journalists reported that she was praised and respected by many audiences.

Q: What did the journalists report about Sarah Kim?

A: *Many journalists reported that people admire her a lot.*

많은 기자들은

보도했어요.

8. A large amount of money was stolen from the bank last night. None of the doors or locks were broken into. The police suspected all the bank clerks so they decided to investigate them. However, all the bank clerks resisted the investigation.

Q: What did each bank clerk say about the investigation?

A: *Each bank clerk said that the police should not interrogate him.*

각각의 은행원은

말했어요.

9. Jamie Oliver is one of the top chefs in Britain. He always brings along exciting new dishes. On a TV cookery show, some viewers comment that he speaks very interestingly and makes the cookery show fun.

Q: What do viewers say about Jamie Oliver, apart from being a good chef?

A: *Someone says that he is also an amusing speaker.*

누군가가

말해요.

10. The teacher, Mrs. Smith told students in her class that the University entrance exam would be very difficult. Nevertheless, all the students passed it. The students all expected the teacher's praise. However, she did not say anything about the exam.

Q: Was anyone praised by Mrs. Smith?

A: *No, every student said that Mrs. Smith did not praise him.*

아니요, 모든 학생은

말했어요.

11. Peter returned from a holiday trip with a tattoo on his right arm. His boss told him to keep it covered up during working hours. However, Peter did not listen to his boss, so everybody in his job heard the rumour of his dismissal from his post.

Q: What did his colleagues hear about Peter?

A: *Each colleague heard that the boss would fire him.*

각각의 동료는

들었어요.

12. American soldiers invaded Iraq together with many other countries in 2003. They were officially looking for dangerous weapons. However, they doubted whether these weapons actually existed.

Q: Did any soldier believe the existence of these weapons?

A: *No, every soldier said that he was not sure about the existence of the weapons.*

아니요, 모든 군인은

말했어요.

13. A group of young children were playing in the school playground.
As the break ended, a big boy called Peter approached the group of young children and bullied them. They all reported him to his teacher.
- Q: What did the group of young children say about Peter?
A: *Each young child said that Peter teased him.*

각각의 아이는

말했어요.

14. Pop star Michael Jackson died in LA at the age of 50.
He was expected to perform a series of comeback concerts in London last summer.
Thousands of people attended to a ceremony in memory of Michael Jackson.
- Q: What were the people of the ceremony say about Michal Jackson?
A: *Many people said that he would be remembered forever.*

많은 사람들은

말했어요.

15. Mary moved into a two-bedroom flat with Sophie.
They seemed to get along really well. However, Mary complained that Sophie interferes too much in her private life.
- Q: Do Mary and Sophie have any problem with sharing their flat?
A: *Yes, someone says that Sophie annoys her a lot.*

예, 누군가가

말해요.

16. John and his friends were playing football in his birthday party.
Suddenly, all his friends gave up playing in the middle of the game, because John kicked them on purpose.
- Q: Did John's friends hurt themselves?
A: *Yes, every friend said that John kicked him on purpose.*

예, 모든 친구는

말했어요.

Appendix 4: Language background information for the study of anaphoric binding

연구 참가자 언어 배경에 관한 질문

1. 이름:
2. 성별: ☐ 여 ☐ 남
3. 나이 (출생연도):
4. 언제 처음으로 영어를 배우기 시작했습니까? 홈스쿨이 아닌 학교나 학원에서 공식적으로 선생님께 배운 시기 (나이)를 적어주세요.
5. 어디에서 처음으로 영어를 배웠습니까? ☐ 학교 ☐ 학원
6. 영어를 배운 기간이 얼마나 됩니까?
7. 영어 연수를 외국에서 해 본 경험이 있습니까? ☐ 네 ☐ 아니오

있다면 어느 나라에서 얼마 동안 공부를 했습니까?
8. 영어 공인 시험을 본 경험이 있습니까? ☐ 네 ☐ 아니오

있다면 어느 종류의 시험을 봤습니까? (예: TOEFL, IELTS 등)
9. 영어 공인 시험을 본 경험이 있다면 점수를 적어주세요.
10. 현재 전공이 무엇입니까?

Appendix 5: The picture verification task for the study of anaphoric binding (그림 찾기 과제)

이름:

Directions (지시문):

There are 20 sentences in this section. Each sentence is followed by a set of two pictures illustrating different actions. Please read each sentence carefully and then choose one of the options by circling on the letter (A), (B), or (C) below the pictures:

(A), if picture (A) expresses the meaning of the sentence;

(B), if picture (B) expresses the meaning of the sentence;

(C), if the sentence could express either the meaning of picture (A) **OR** picture (B).

(그림 찾기 과제에는 총 20 개의 문장이 있습니다. 각 문장에는 2 개의 서로 다른 그림이 나와 있습니다. 각 문장을 잘 읽고 문장의 의미와 맞다고 생각되는 그림(들)을 다음과 같이 고르십시오:

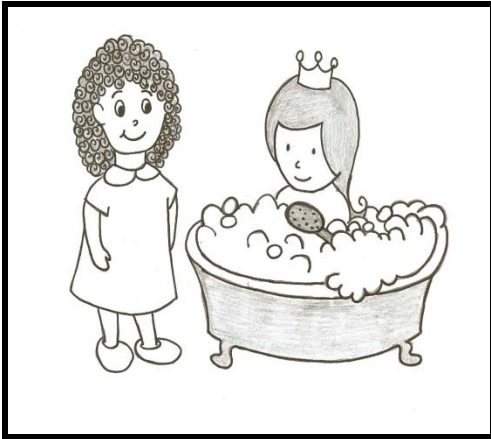
만약 그림 (A)가 그 문장의 의미를 표현한다면, (A) 위에;

만약 그림 (B)가 그 문장의 의미를 표현한다면, (B) 위에;

만약 그림 (A) 또는 그림 (B) 모두 그 문장의 의미를 표현한다면,

(C) 위에 ○ 표를 하세요.)

1. Miss Curly said that Miss Princess washed herself.



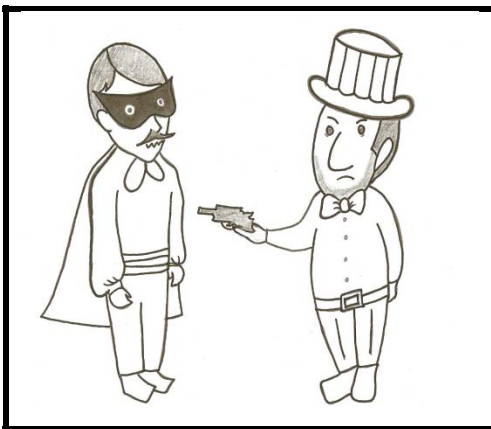
(A)



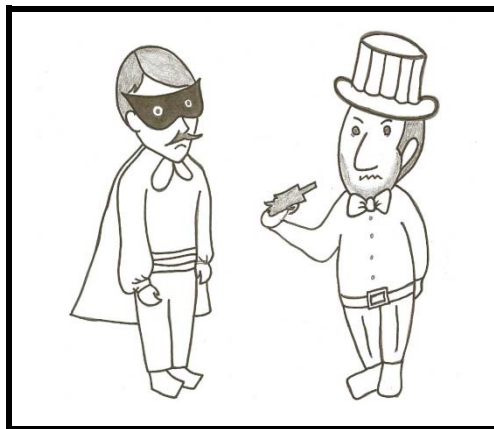
(B)

(C) either A or B

2. Mr. Mask dreamed that Mr. Hat shot him.



(A)



(B)

(C) either A or B

3. Miss Princess told Miss Curly about herself.



(A)

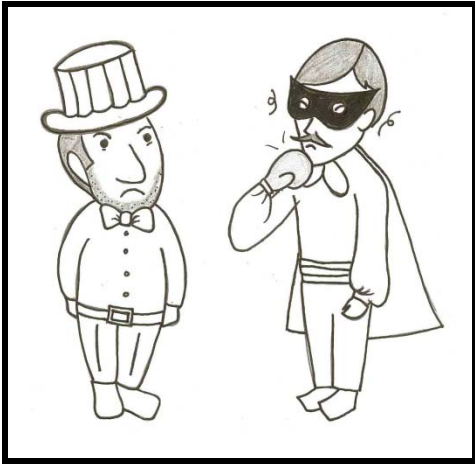


(B)

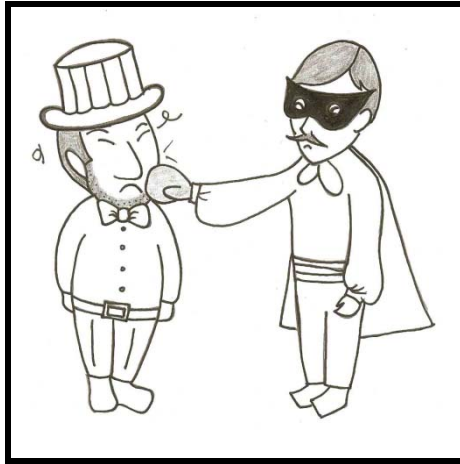
(C) either A or B

4. Grandpa said that Pinocchio was pointing to himself.

5. Mr. Hat said that Mr. Mask punched him.



(A)

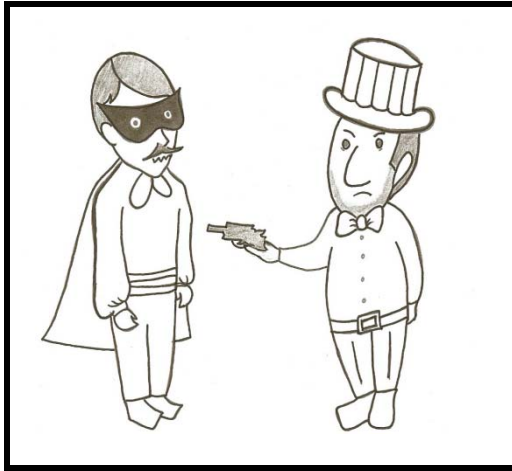


(B)

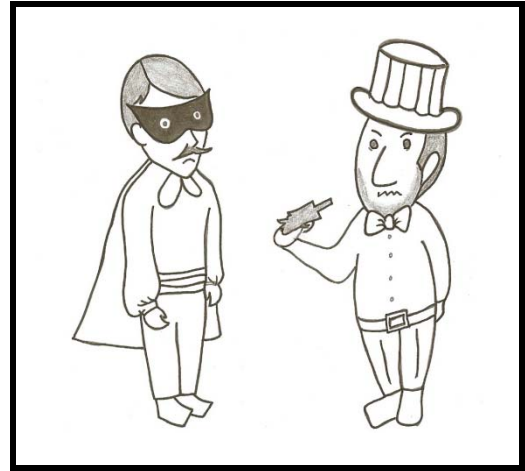
(C) either A or B

6. Grandma told Cinderella to pinch herself.

7. Mr. Mask dreamed that Mr. Hat shot himself.



(A)



(B)

(C) either A or B

8. Pinocchio asked Grandpa about himself.

9. Mr. Hat told Mr. Mask to paint himself.



(A)



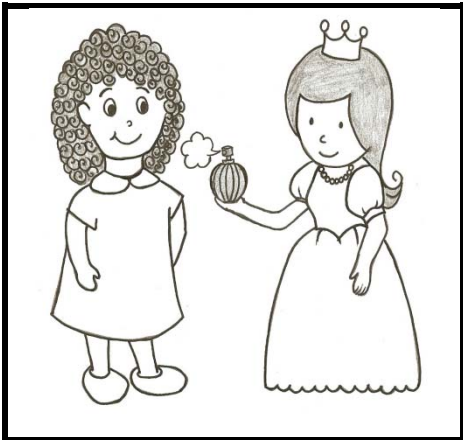
(B)

(C) either A or B

10. Miss Curly asked Miss Princess to spray her with perfume.



(A)

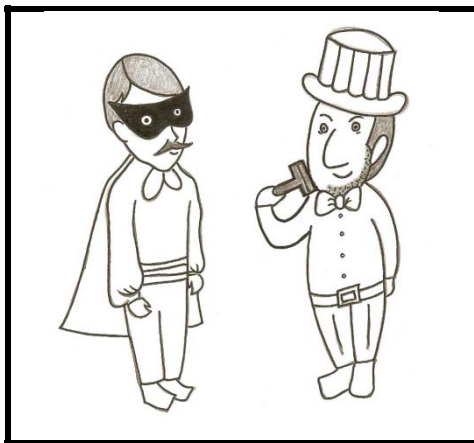


(B)

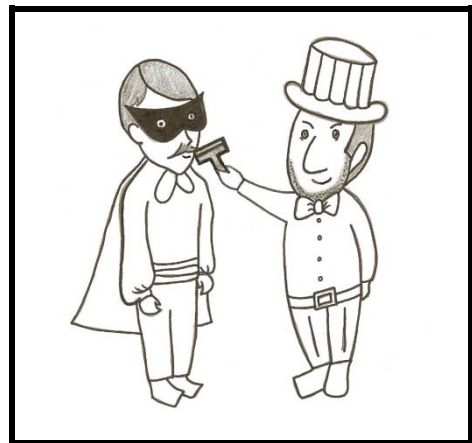
(C) either A or B

11. Cinderella showed Grandma a picture of herself.

12. Mr. Mask told Mr. Hat to shave himself.



(A)



(B)

(C) either A or B

13. Pinocchio said that Grandpa was pointing to him.

14. Miss Curly asked Miss Princess to spray herself with perfume.



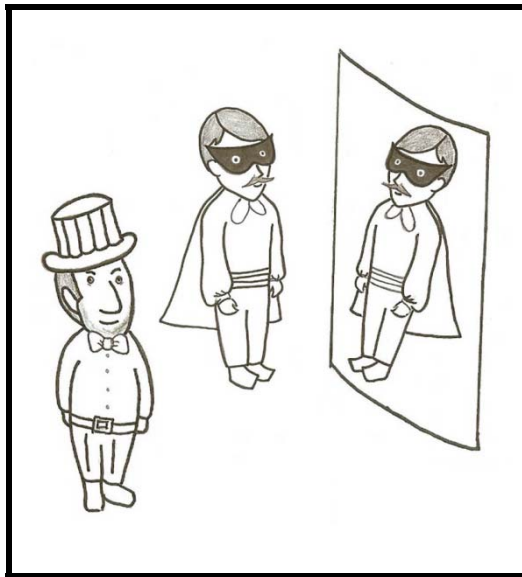
(A)



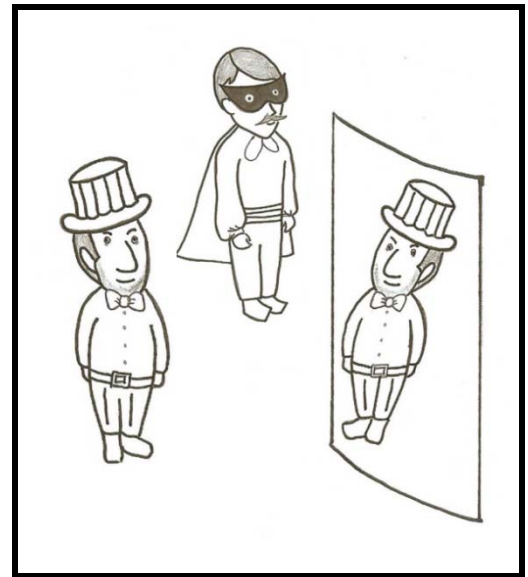
(B)

(C) either A or B

15. Mr. Hat showed Mr. Mask a reflection of himself in the mirror.



(A)



(B)

(C) either A or B

16. Cinderella said that Grandma pinched herself.

17. Miss Princess gave Miss Curly a book about herself.



(A)

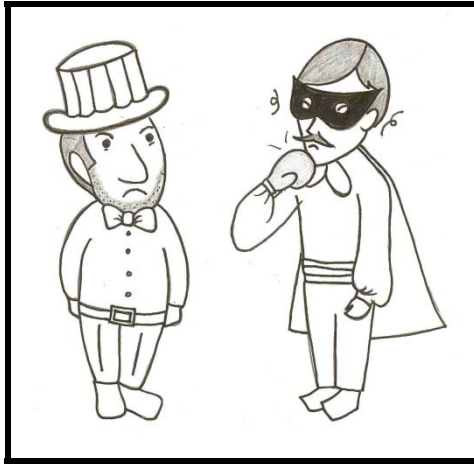


(B)

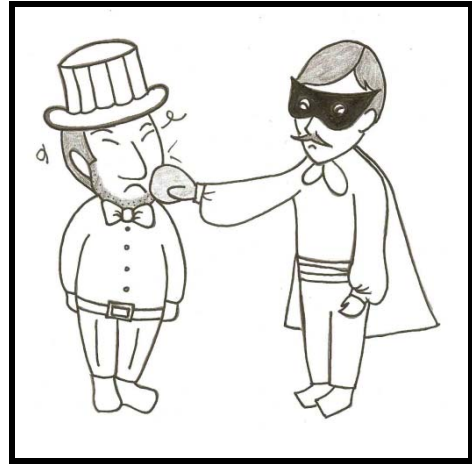
(C) either A or B

18. Grandma wants Cinderella to point to herself.

19. Mr. Hat said that Mr. Mask punched himself.



(A)



(B)

(C) either A or B

20. Cinderella told Grandma to pinch her.

Appendix 6: Individual results of the co-reference comprehension task for the OPC

6.1: Individual results of the comprehension task for the OPC by Korean controls (n=20)
(Type 1 ~ Type 4)

	Type 1						Type 2						Type 3			Type 4		
	1	7	10	15	22	31	4	9	13	19	28	36	3	32	35	14	21	30
	F	F	F	F	F	F	B/F	B/F	B/F	B/F	B/F	B/F	B/F	B/F	B/F	B/F	B/F	B/F
1	F	F	F	F	F	F	F	B	B	B	B	F	B	F	F	B	B	B
2	F	F	F	F	F	F	B	F	B	F	B	F	F	F	F	F	B	F
3	F	N	F	F	F	F	F	B/F	B	B	B	N	F	F	F	B	B	B
4	F	F	F	F	F	F	B	B	B	B	B	F	F	F	F	B	B	B
5	F	F	F	F	F	F	B	B	B	B	B	F	B	F	F	B	B	B
6	F	F	F	F	F	F	F	B	B	F	B	F	F	F	F	B	B	B
7	F	F	F	F	F	F	B	B	B	B	B	F	F	F	F	B	B	B
8	F	F	F	F	F	F	F	B/F	B	B/F	B/F	F	B/F	F	F	B	B	B
9	F	F	F	F	F	F	B/F	B	B	F	B	F	F	F	F	B	B	B
10	F	F	F	F	F	B	B	F	B	F	B	F	F	B	F	B	B	B
11	F	F	F	F	F	F	B	B/F	B	B/F	B	B/F	F	B/F	F	B/F	B	B
12	F	F	F	F	F	F	F	B	B	B	B	F	B	B	F	B	B	B
13	F	F	F	F	F	F	B	B	B	B	B	F	B	F	F	B	B	B
14	F	F	F	F	F	F	F	B	B	B	B	F	B	F	F	B	B	B
15	F	B	F	F	F	F	B	B	B	B	B	F	B	F	F	B	B	B
16	F	F	F	F	F	F	B	B	B	B	B	F	F	F	F	B	B	B
17	F	F	F	F	F	F	B/F	B	B/F	B/F	B	B	B	B/F	B/F	B/F	B/F	B
18	F	F	F	F	F	F	B	B	B	B	B	F	B	B/F	B/F	B/F	B	B
19	F	F	F	F	F	F	B	B	B	B	B	B	B	B	F	B	B	B
20	F	F	F	F	F	F	B/F	B	B	B	B	F	B	B	F	B	B	B

Note: B=bound reading, F=free (disjoint) reading, N=neither

6.2: Individual results of the comprehension task for the OPC by Korean controls (n=20)

(Type 5 ~ Type 8)

	Type 5						Type 6						Type 7			Type 8		
	2	11	16	23	29	33	5	18	20	24	26	34	8	12	27	6	17	25
	F	F	F	F	F	F	B/F	B/F	B/F	B/F	B/F	B/F	B/F	B/F	B/F	B/F	B/F	B/F
1	F	F	F	F	F	F	F	F	F	F	B	F	F	F	F	B	F	B
2	F	B	F	F	F	F	B	F	B	F	B	F	B	B	F	B	B	B
3	F	F	F	F	F	F	B	F	F	B/F	B/F	F	F	F	B/F	B	B	B
4	F	F	F	F	F	F	F	B	F	F	F	F	F	F	F	B	B	B
5	F	F	F	F	F	F	B	F	B	B	F	F	F	F	F	B	B	B
6	F	F	F	F	F	F	B	F	B	F	B	F	F	F	F	B	F	B
7	F	F	F	F	F	F	B	F	F	F	B	F	B	F	B	B	B	B
8	F	F	F	F	F	F	F	F	B/F	F	B/F	F	F	F	F	B	F	B
9	F	F	F	F	F	F	B	F	B/F	F	B/F	F	B	F	B/F	B/F	B	B
10	F	F	F	B	F	F	B	F	F	F	F	F	B	B	B	B	B	B
11	F	B/F	F	F	F	F	F	B/F	B/F	B/F	B/F	B/F	B/F	B/F	B/F	B/F	B	B/F
12	F	F	F	F	F	F	B	F	F	F	F	F	B	F	B	B	B	B
13	F	F	F	F	F	F	B	F	B	F	B	F	B	B	B	F	B	F
14	F	B	F	F	F	F	F	F	F	F	F	F	B	B	B	B	B	B
15	F	F	F	F	F	F	B	B/F	F	F	B	F	F	F	F	B	B	B
16	F	F	F	F	F	F	B	F	F	F	F	F	F	F	F	B	F	B
17	F	B/F	F	F	F	F	B/F	B/F	B/F	B	B	B	B/F	B/F	B/F	B/F	B/F	B
18	F	F	F	F	F	F	F	F	F	F	B/F	B/F	B	B	B/F	B	B	B/F
19	F	F	F	F	F	F	B	F	F	F	B	F	B	B	B	B	B	B
20	F	F	F	F	F	F	B	B/F	B	F	B	F	B	B	B	B	B	B

Note: B=bound reading, F=free (disjoint) reading, N=neither

6.3: Individual results of the comprehension task for the OPC by intermediate learners

(n=19) (Type 1 ~ Type 4)

	Type 1						Type 2						Type 3			Type 4		
	1	7	10	15	22	31	4	9	13	19	28	36	3	32	35	14	21	30
	F	F	F	F	F	F	B/F	B/F	B/F	B/F	B/F	B/F	B/F	B/F	B/F	B/F	B/F	B/F
1	F	F	F	B	B	B	F	B/F	B	F	B	B	B/F	B	B	B	B	F
2	F	F	F	B	F	B	F	B	B	B	B	F	B	F	F	B	B	B
3	F	F	F	F	F	B	F	B	B	B	B	F	B	B	B	B	B/F	B/F
4	F	F	F	F	F	F	B	B	B/F	B	B/F	F	F	F	F	B	B/F	B/F
5	F	F	F	F	F	F	F	B/F	B/F	B/F	B/F	B/F	F	F	F	B/F	B/F	B/F
6	F	F	F	F	F	F	F	B/F	B	B/F	B/F	B	F	F	F	B	B	B
7	F	F	F	F	F	F	B/F	B	B/F	B	B	B/F	F	F	F	B	B/F	B
8	F	F	B	F	F	F	B/F	F	F	B	B	B	B	F	F	B	B	B
9	F	F	F	F	F	F	B	B/F	B/F	B	B/F	B/F	F	F	F	B	B	B
10	F	F	F	F	F	F	B/F	B	F	F	B/F	B	F	F	F	B/F	B/F	B
11	F	F	F	F	F	F	B	B	F	F	F	F	B	F	F	B	F	B
12	N	B	B/F	F	F	F	B	B	B	B	B	B	B	F	B	B	B/F	B
13	B/F	B	B	B	B	B/F	F	F	B	B	B/F	F	F	F	F	B	B/F	B/F
14	N	F	B/F	F	B/F	F	F	F	N	B/F	B	F	B/F	B/F	N	N	B	B
15	F	F	B/F	F	B/F	B/F	F	F	B/F	B/F	B/F	F	B	B	F	B	B	B
16	F	B/F	F	B/F	F	F	B	B/F	B/F	B/F	B/F	B/F	B/F	F	F	B/F	B/F	B/F
17	F	F	F	F	B/F	F	F	B/F	B/F	B/F	B/F	B/F	F	B/F	B/F	B/F	B/F	B
18	F	F	F	B	F	F	N	B	B	B	B	F	B	F	F	B	B	B
19	F	F	B/F	F	F	F	B/F	B	B/F	B/F	B/F	F	B/F	F	F	B	B	B

Note: B=bound reading, F=free (disjoint) reading, N=neither

6.4: Individual results of the comprehension task for the OPC by intermediate learners

(n=19) (Type 5 ~ Type 8)

	Type 5						Type 6						Type 7			Type 8		
	2	11	16	23	29	33	5	18	20	24	26	34	8	12	27	6	17	25
	F	F	F	F	F	F	B/F	B/F	B/F	B/F	B/F	B/F	B/F	B/F	B/F	B/F	B/F	B/F
1	F	F	B	F	B/F	B/F	B/F	F	B/F	F	B/F	F	B	B	B	B	B/F	B
2	F	B	F	F	F	F	F	F	F	F	B	F	B	B	B	B	B	B
3	F	B	F	F	B	F	B/F	F	B	B/F	B	F	B	B	B	B	B/F	B
4	F	F	F	F	F	F	B/F	B/F	B	B/F	B/F	B/F	F	F	F	F	B/F	B/F
5	F	F	F	F	F	F	B/F	B/F	B	B/F	B/F	B/F	F	F	F	B/F	B/F	B/F
6	B/F	F	F	F	F	F	B/F	B/F	B	B/F	F	B/F	F	B/F	F	B/F	F	F
7	F	F	F	F	F	F	B	B	B	B/F	B	B	F	F	F	B	B	B
8	F	F	F	F	F	F	B	F	F	F	F	F	B	B	F	B	F	F
9	F	F	F	B/F	B/F	F	F	B/F	B/F	B/F	B/F	B/F	F	F	B/F	B/F	F	B
10	F	F	F	F	B/F	F	B/F	B	B/F	B/F	F	F	B/F	B/F	B/F	B	B/F	B/F
11	F	B	F	F	F	F	B	F	F	F	F	B	F	F	B	B	B	B
12	F	B	F	F	F	F	B/F	B	B	F	F	B	B/F	B/F	F	B	B	B
13	B/F	B	F	B/F	F	F	B/F	F	B	B/F	F	F	F	B/F	B/F	B	B	B/F
14	N	N	F	F	F	B/F	F	F	B/F	B/F	B/F	F	B	B	B	B	B	B
15	F	F	F	F	B/F	B/F	B/F	F	B/F	B/F	B/F	F	B/F	B/F	B	B/F	F	B
16	B/F	B/F	B/F	F	F	F	B	B/F	B/F	B/F	B/F	B/F	B/F	B/F	F	B/F	B/F	B/F
17	F	F	F	B/F	B/F	B/F	B/F	F	B/F	B/F	B/F	B/F	F	F	B/F	B/F	F	B/F
18	F	F	F	F	F	F	F	B	F	F	F	B	F	F	F	B/F	F	F
19	B/F	B/F	F	N	F	F	B/F	B	B	F	B	B/F	F	B	F	B	B	B

Note: B=bound reading, F=free (disjoint) reading, N=neither

6.5: Individual results of the comprehension task for the OPC by advanced learners

(n=22) (Type 1 ~ Type 4)

	Type 1						Type 2						Type 3			Type 4		
	1	7	10	15	22	31	4	9	13	19	28	36	3	32	35	14	21	30
	F	F	F	F	F	F	B/F	B/F	B/F	B/F	B/F	B/F	B/F	B/F	B/F	B/F	B/F	B/F
1	F	F	F	F	F	F	F	B/F	B	B	B	B	F	F	F	B	B	B
2	B/F	F	F	F	F	F	B/F	B/F	B	B/F	F	B	B	F	F	B	B	F
3	F	F	F	F	F	F	B/F	B	B/F	B/F	B/F	F	F	F	F	B	B/F	B
4	F	F	F	F	F	F	B/F	B/F	B/F	B	B	F	B/F	F	F	B	B/F	B
5	F	F	F	F	F	F	B	B	B/F	B/F	B/F	B/F	F	F	F	B/F	B/F	B/F
6	F	F	F	F	F	F	B/F	B/F	B/F	B/F	B/F	B/F	F	F	F	B/F	B/F	B/F
7	F	B	B/F	B/F	F	B/F	B	B	B	B/F	B/F	B/F	B	B/F	B/F	B/F	B	B
8	F	B/F	B/F	F	B/F	F	B/F	B/F	B/F	B/F	B/F	B/F	B	F	F	B	B/F	B/F
9	B/F	B/F	F	B/F	F	B/F	B/F	B	B	B/F	B/F	B/F	B/F	F	F	B/F	B/F	B/F
10	F	F	F	F	F	F	B/F	B	B	B/F	B/F	B/F	B/F	F	F	B/F	B/F	B/F
11	F	F	B/F	F	F	F	B	B	B	B	B	B	F	F	F	B	B	B
12	F	F	F	F	F	F	B	B	B	B	B	B	F	F	F	B	B	B
13	F	F	F	F	F	F	B/F	B/F	B/F	B/F	B/F	B/F	F	F	F	B/F	B/F	B/F
14	F	F	F	F	F	F	B/F	B	B/F	B	B	B	B/F	F	F	B	B	B
15	F	F	B/F	B/F	B	B/F	B/F	B/F	B/F	B/F	B/F	B/F	F	F	B/F	B/F	B	B/F
16	B/F	B/F	B	B/F	F	B/F	B/F	B/F	B	B/F	B/F	F	F	F	F	B	B/F	B/F
17	F	B/F	F	F	F	F	B/F	B/F	B/F	B/F	B	B/F	B/F	F	B/F	B/F	B/F	B
18	F	B/F	F	B/F	F	B/F	B	B/F	B/F	B	B/F	B/F	F	F	F	B	B	B/F
19	F	F	F	F	F	F	B	B	B	B/F	B	B	F	F	F	B/F	B/F	B/F
20	F	F	F	F	F	F	B/F	B/F	B/F	B/F	B/F	B/F	F	F	F	F	B	F
21	F	F	F	F	F	F	B/F	B/F	B/F	B/F	B/F	B/F	F	F	F	B/F	B/F	B/F
22	F	F	B/F	B/F	F	F	B/F	B/F	B	B	B	B/F	F	B	F	F	B	B

Note: B=bound reading, F=free (disjoint) reading, N=neither

6.6: Individual results of the comprehension task for the OPC by advanced learners
(n=22) (Type5 ~ Type 8)

	Type 5						Type 6						Type 7			Type 8		
	2	11	16	23	29	33	5	18	20	24	26	34	8	12	27	6	17	25
	F	F	F	F	F	F	B/F	B/F	B/F	B/F	B/F	B/F	B/F	B/F	B/F	B/F	B/F	B/F
1	F	F	F	F	F	F	B/F	B/F	B/F	B/F	B/F	B/F	F	F	F	B	B/F	B
2	F	B/F	F	F	B	F	B	B/F	B/F	F	F	B/F	B/F	B/F	B	B/F	B	B/F
3	F	F	F	F	F	F	B/F	F	B/F	B/F	B/F	F	F	F	F	B/F	B/F	B/F
4	F	B/F	F	F	F	F	B/F	F	F	F	B/F	F	B/F	B/F	B/F	B/F	B/F	B
5	F	F	F	F	F	F	F	B/F	B/F	B/F	B/F	B/F	F	F	F	B/F	B/F	B/F
6	F	F	F	F	F	F	B/F	B/F	B/F	B/F	B/F	B/F	F	F	F	B/F	B/F	B/F
7	F	F	F	F	B/F	F	B/F	F	B/F	B/F	F	B/F	F	B	B/F	B/F	B/F	B/F
8	B/F	B/F	F	F	B/F	B/F	B	B/F	B/F	B/F	F	B/F	B/F	B	B/F	B	F	B/F
9	B/F	F	F	B/F	B/F	F	B/F	B/F	F	F	F	F	B/F	F	B/F	B/F	B/F	B/F
10	B/F	B/F	F	F	F	F	B/F	B	B/F	F	B/F	B/F	F	F	F	B/F	B/F	B/F
11	F	B/F	F	F	B/F	F	B	B	B/F	B/F	B	B/F	B/F	B/F	B/F	B/F	B/F	B
12	B/F	B/F	F	F	F	F	B	B	B	B	B	B	F	F	F	B/F	B	B
13	F	B/F	F	F	F	F	B/F	B/F	B/F	F	B/F	B/F	F	F	F	B/F	B/F	B/F
14	B/F	F	F	F	F	F	B/F	B/F	B/F	F	B	B	F	F	F	B/F	B/F	B/F
15	F	B/F	F	F	B/F	B/F	F	B/F	B/F	B	F	F	F	B/F	B/F	B/F	B/F	B
16	F	B/F	F	F	F	B/F	B/F	B/F	B/F	B/F	B/F	B/F	F	B/F	F	B/F	B/F	B/F
17	B/F	B/F	F	F	F	F	B	F	F	F	B	B/F	F	B/F	B	B/F	B/F	B/F
18	F	F	F	B/F	B/F	B/F	F	B/F	B/F	B/F	B/F	B/F	F	F	F	B/F	B/F	B/F
19	F	B/F	F	F	F	F	F	B	B	B	B/F	B/F	F	F	F	B/F	B/F	B
20	F	F	F	B/F	F	F	F	B/F	F	B/F	F	F	F	F	B/F	B	B/F	F
21	F	F	F	F	F	F	B/F	B/F	B/F	B/F	B/F	B/F	F	F	F	B/F	B/F	B/F
22	F	B/F	F	B	F	F	B	B/F	F	F	B	B	F	F	B	B	F	B

Note: B=bound reading, F=free (disjoint) reading, N=neither

Appendix 7: Individual results of the story-based translation task for the OPC

7.1: Individual results of the translation task for the OPC by Korean controls (n=20)

	Type 1				Type 2				Type 3				Type 4			
	1	3	6	12	2	5	9	14	8	10	13	16	4	7	11	15
	N	N	N	N	N/O	N/O	N/O	N/O	N	N	N	N	N/O	N/O	N/O	N/O
1	N	N	N	N	O	O	O	O	N	N	N	N	O	O	O	O
2	N	N	N	N	O	O	O	O	N	N	N	N	O	O	O	O
3	N	N	N	N	O	O	O	O	N	N	N	N	O	O	O	N/O
4	N	N	N	N	O	O	O	O	O	N	N	N	O	O	O	O
5	N	N	N	N	O	O	O	O	N	N	N	N	O	O	O	N
6	N	N	N	N	O	O	O	O	N	N	N	N	O	O	O	O
7	N	N	N	N	O	O	O	O	N	N	N	N	O	O	O	O
8	O/N	N	N	N	O	O	O	O	N	N	N	N	O	O	O	O
9	N	N	N	N	O	O	O	O	O	N	N	N	O	O	O	O
10	O/N	N	N	N	O	O	O	O	N	N	N	N	O	O	O	N/O
11	N	N	N	N	O	O	O	O	caki	N	N	caki	N/O	O	O	caki
12	N	N	N	N	O	O	O	O	N	N	N	N	O	O	O	N
13	N	N	N	N	O	O	O	N/O	N	N	N	N	N	O	N/O	N/O
14	N	N	N	N	O	O	O	O	N	N	N	N	O	O	O	O
15	N	N	N	N	O	O	O	O	N	N	N	N	O	O	O	O
16	N	N	N	N	O	O	O	O	N	caki	N	N	O	O	O	O
17	N	N	N	N	O	O	O	O	caki	caki	caki	caki	O	O	O	O
18	N	N	N	N	O	O	O	O	N	N	N	N	N/O	O	O	O
19	N	N	N	N	O	O	O	O	N	N	N	N	N/O	O	N/O	O
20	N	N	N	N	O	O	O	N/O	N	N	N	N	N/O	O	O	N/O

Note: N=null pronoun, O= overt pronoun

7.2: Individual results of the translation task for the OPC by intermediate learners (n=19)

	Type 1				Type 2				Type 3				Type 4			
	1	3	6	12	2	5	9	14	8	10	13	16	4	7	11	15
	N	N	N	N	N/O	N/O	N/O	N/O	N	N	N	N	N/O	N/O	N/O	N/O
1	N	N	N	N	N	N	O	O	N	N	N	N	O	N	N	N
2	O	N	N	N	O	O	O	O	N	N	N	N	O	O	O	O
3	N	N	N	N	O	O	O	O	N	N	N	N	O	O	O	N
4	N	N	N	N	O	O	O	O	N	N	O	N	N	O	N	O
5	N	N	N	N	O	O	O	O	N	N	N	N	O	O	O	N
6	O	N	N	N	N	O	N	O	N	N	N	N	N	N	N	N
7	O	N	N	N	N	O	N	O	N	N	N	N	N	N	N	N
8	N	N	N	N	O	O	O	O	N	N	N	N	O	O	O	N
9	N	N	N	N	O	O	O	O	N	N	O	N	O	O	O	N
10	O	N	N	N	O	N	O	O	O	O	N	N	N	O	N	N
11	N	N	N	N	N	N	O	N	N	N	N	N	N	N	N	N
12	O	N	N	N	O	O	O	O	N	O	O	N	O	O	O	O
13	O	N	N	O	N	O	O	O	O	O	N	O	N	N	O	O
14	N	N	N	N	O	O	O	O	N	N	N	N	O	O	O	N
15	N	N	N	N	O	O	O	N	N	N	N	N	O	O	O	N
16	O	N	N	N	O	O	O	O	N	N	N	N	O	O	O	O
17	N	N	N	N	O	O	O	O	N	O	N	N	O	O	N	O
18	N	N	N	N	O	O	O	O	O	O	O	O	O	O	O	O
19	N	N	N	N	O	O	O	O	N	O	O	O	N	O	O	O

Note: N=null pronoun, O= overt pronoun

7.3 Individual results of the translation task for the OPC by advanced learners (n=22)

	Type 1				Type 2				Type 3				Type 4			
	1	3	6	12	2	5	9	14	8	10	13	16	4	7	11	15
	N	N	N	N	N/O	N/O	N/O	N/O	N	N	N	N	N/O	N/O	N/O	N/O
1	caki	N	N	N	N	O	N	O	caki	N	caki	N	O	O	O	O
2	N	N	N	N	O	O	O	O	N	N	N	N	O	O	O	O
3	N	N	N	N	O	O	O	O	N	N	N	N	N	O	O	N
4	casin	N	N	N	O	O	O	O	O	casin	O	casin	O	O	O	O
5	N	N	N	N	O	N	N	N	caki	N	caki	caki	N	N	O	O
6	O	N	N	N	O	O	O	N	N	N	N	N	O	O	O	N
7	N	N	N	N	O	O	O	O	N	N	N	N	O	O	O	O
8	N	N	N	N	O	O	O	O	N	N	N	N	N	O	O	N
9	O	caki	N	N	O	O	O	O	caki	N	O	O	N	O	O	O
10	N	N	N	N	O	O	O	O	casin	N	casin	N	N	O	O	O
11	N	N	N	N	N	N	O	O	O	N	caki	N	N	O	O	N
12	N	N	N	N	O	O	O	O	O	O	O	caki	O	O	O	N
13	N	N	N	N	O	O	O	O	caki	N	N	N	N	N	O	N
14	N	N	N	N	N	N	N	N	N	N	N	N	N	O	N	N
15	O	N	N	N	O	O	O	N	O	N	N	N	O	O	N	N
16	N	N	N	N	N	O	N	O	N	N	N	N	O	N	N	O
17	N	N	N	N	O	O	O	O	N	N	N	O	O	O	O	N
18	caki	N	N	N	O	O	O	O	N	N	N	N	O	O	O	N
19	N	N	N	N	O	O	O	O	N	N	O	N	O	O	O	O
20	N	N	N	N	O	O	N	O	N	N	N	N	O	O	N	O
21	N	N	N	N	N	N	O	O	caki	caki	caki	N	O	O	O	O
22	O	N	N	N	N	O	N	O	N	N	N	N	O	O	O	N

Note: N=null pronoun, O= overt pronoun

Appendix 8: Individual results of the picture verification task for anaphoric binding

8.1: Individual results of the picture verification task for anaphoric binding by English
controls (n=20)

	Type 1 (locality) (Finite clauses)					Type 2 (locality) (Non-finite clauses)					Type 3 (orientation) (One clause sentence)				
	1	4	7	16	19	6	9	12	14	18	3	8	11	15	17
	loc	loc	loc	loc	loc	loc	loc	loc	loc	loc	both	both	both	both	both
1	loc	loc	loc	loc	loc	loc	loc	loc	loc	loc	sub	both	sub	both	sub
2	loc	loc	loc	loc	loc	loc	loc	loc	loc	loc	sub	both	sub	both	sub
3	loc	loc	loc	loc	loc	loc	loc	loc	loc	loc	sub	both	sub	sub	sub
4	loc	loc	loc	loc	loc	loc	loc	loc	loc	loc	sub	sub	sub	sub	sub
5	loc	loc	loc	loc	loc	loc	loc	loc	loc	loc	sub	sub	sub	obj	sub
6	loc	loc	loc	loc	loc	loc	loc	loc	loc	loc	both	both	both	both	sub
7	loc	loc	loc	loc	loc	loc	loc	loc	loc	loc	both	both	both	obj	both
8	loc	loc	loc	loc	loc	loc	loc	loc	loc	loc	sub	sub	sub	sub	sub
9	loc	loc	loc	loc	loc	loc	loc	loc	loc	loc	sub	sub	sub	sub	sub
10	loc	loc	loc	loc	loc	loc	loc	loc	loc	loc	both	both	both	both	both
11	loc	loc	loc	loc	loc	loc	loc	loc	loc	loc	sub	sub	sub	sub	sub
12	loc	loc	loc	loc	loc	loc	loc	loc	loc	loc	both	both	sub	both	sub
13	loc	loc	loc	loc	loc	loc	loc	loc	loc	loc	both	both	sub	both	both
14	loc	loc	loc	loc	loc	loc	loc	LD	loc	loc	both	both	both	both	both
15	loc	loc	loc	loc	loc	loc	loc	loc	loc	loc	both	sub	sub	both	sub
16	loc	loc	loc	loc	loc	loc	loc	loc	loc	loc	both	obj	both	both	both
17	loc	loc	loc	loc	loc	loc	loc	loc	loc	loc	sub	obj	sub	sub	sub
18	loc	loc	loc	loc	loc	loc	loc	loc	loc	loc	both	both	sub	both	both
19	loc	loc	loc	loc	loc	loc	loc	loc	loc	loc	sub	both	both	sub	both
20	loc	loc	loc	loc	loc	loc	loc	loc	loc	loc	sub	obj	both	both	sub

Note: loc=local binding, LD=long-distance binding, sub=subject, obj=object

8.2: Individual results of the picture verification task for anaphoric binding by low-intermediate learners (n=19)

	Type 1 (locality) (Finite clauses)					Type 2 (locality) (Non-finite clauses)					Type 3 (orientation) (One clause sentence)				
	1	4	7	16	19	6	9	12	14	18	3	8	11	15	17
	loc	loc	loc	loc	loc	loc	loc	loc	loc	loc	both	both	both	both	both
1	loc	loc	loc	loc	loc	loc	LD	loc	loc	LD	sub	sub	sub	sub	sub
2	loc	loc	loc	loc	LD	loc	loc	LD	loc	LD	sub	sub	sub	obj	subj
3	loc	loc	loc	loc	loc	loc	loc	loc	loc	loc	sub	sub	sub	obj	sub
4	loc	loc	loc	loc	loc	loc	loc	loc	loc	loc	sub	sub	sub	sub	sub
5	loc	loc	loc	loc	loc	loc	loc	loc	loc	loc	sub	sub	sub	obj	sub
6	loc	loc	loc	loc	loc	loc	loc	loc	LD	loc	sub	both	obj	obj	sub
7	loc	loc	loc	loc	loc	loc	LD	LD	loc	LD	sub	sub	sub	obj	sub
8	loc	loc	loc	loc	loc	LD	LD	loc	loc	loc	sub	sub	obj	obj	sub
9	loc	loc	loc	loc	loc	loc	loc	loc	loc	loc	obj	obj	obj	obj	obj
10	loc	loc	loc	loc	loc	loc	loc	loc	loc	loc	sub	obj	sub	obj	sub
11	loc	both	loc	loc	both	loc	both	loc	loc	loc	both	sub	sub	obj	sub
12	loc	both	both	loc	loc	loc	loc	loc	loc	loc	both	both	sub	sub	sub
13	loc	loc	loc	loc	loc	loc	both	loc	loc	loc	sub	sub	sub	obj	sub
14	loc	loc	LD	loc	loc	LD	loc	loc	LD	loc	sub	sub	sub	sub	sub
15	loc	LD	LD	loc	loc	loc	LD	LD	loc	LD	sub	sub	obj	obj	sub
16	loc	LD	loc	LD	loc	loc	loc	LD	LD	loc	obj	sub	sub	sub	sub
17	loc	loc	loc	loc	loc	LD	LD	LD	LD	LD	sub	sub	sub	sub	sub
18	loc	loc	loc	loc	loc	loc	loc	loc	loc	loc	sub	sub	sub	obj	sub
19	loc	LD	loc	loc	loc	loc	loc	LD	LD	LD	sub	sub	sub	obj	sub

Note: loc=local binding, LD=long-distance binding, sub=subject, obj=object

8.3: Individual results of the picture verification task for anaphoric binding by
intermediate learners (n=26)

	Type 1 (locality) (Finite clauses)					Type 2 (locality) (Non-finite clauses)					Type 3 (orientation) (One clause sentence)				
	1	4	7	16	19	6	9	12	14	18	3	8	11	15	17
	loc	loc	loc	loc	loc	loc	loc	loc	loc	loc	both	both	both	both	both
1	loc	LD	loc	loc	loc	loc	loc	loc	loc	loc	sub	sub	sub	sub	sub
2	loc	loc	loc	loc	loc	loc	loc	loc	loc	loc	sub	sub	obj	obj	sub
3	loc	loc	loc	loc	both	loc	both	loc	both	loc	sub	sub	both	obj	sub
4	loc	loc	loc	loc	loc	loc	loc	loc	loc	LD	sub	sub	sub	sub	sub
5	loc	loc	loc	loc	loc	loc	loc	loc	LD	LD	sub	sub	sub	obj	sub
6	loc	loc	loc	loc	loc	loc	LD	LD	LD	LD	obj	sub	sub	sub	sub
7	loc	loc	loc	loc	loc	loc	loc	loc	loc	loc	sub	sub	sub	sub	sub
8	loc	loc	loc	loc	loc	loc	loc	loc	loc	loc	sub	sub	both	obj	sub
9	loc	loc	loc	loc	loc	LD	loc	loc	LD	loc	sub	sub	sub	obj	sub
10	loc	both	loc	both	both	both	loc	loc	loc	bot	both	sub	sub	sub	both
11	loc	loc	loc	loc	loc	loc	loc	loc	loc	loc	sub	obj	both	obj	sub
12	loc	loc	loc	loc	loc	loc	loc	loc	loc	loc	sub	sub	sub	both	both
13	loc	loc	loc	loc	loc	loc	loc	loc	loc	loc	sub	sub	sub	obj	sub
14	loc	loc	loc	loc	loc	loc	loc	loc	loc	loc	both	both	sub	obj	sub
15	loc	loc	loc	loc	loc	loc	LD	LD	loc	loc	sub	sub	sub	obj	sub
16	loc	loc	loc	loc	loc	loc	loc	LD	loc	LD	sub	sub	sub	obj	sub
17	loc	loc	loc	loc	loc	loc	loc	loc	loc	loc	sub	sub	sub	obj	sub
18	loc	loc	loc	loc	loc	loc	loc	loc	loc	loc	sub	sub	sub	sub	sub
19	loc	loc	loc	loc	loc	loc	loc	loc	loc	loc	sub	sub	sub	obj	sub
20	loc	loc	loc	loc	loc	loc	loc	loc	loc	loc	sub	sub	sub	obj	sub
21	loc	loc	loc	loc	loc	loc	LD	LD	loc	loc	sub	sub	obj	obj	sub
22	LD	loc	loc	loc	loc	loc	loc	loc	loc	loc	sub	sub	sub	obj	sub
23	loc	loc	loc	loc	loc	LD	LD	loc	loc	loc	sub	sub	both	obj	sub
24	loc	loc	loc	loc	loc	loc	LD	LD	LD	LD	sub	sub	sub	obj	sub
25	LD	loc	loc	loc	loc	loc	loc	loc	loc	loc	sub	sub	sub	obj	sub
26	loc	loc	loc	loc	loc	loc	loc	loc	LD	LD	sub	sub	sub	sub	sub

Note: loc=local binding, LD=long-distance binding, sub=subject, obj=object

8.4: Individual results of the picture verification task for anaphoric binding by advanced learners (n=25)

	Type 1 (locality) (Finite clauses)					Type 2 (locality) (Non-finite clauses)					Type 3 (orientation) (One clause sentence)				
	1	4	7	16	19	6	9	12	14	18	3	8	11	15	17
	loc	loc	loc	loc	loc	loc	loc	loc	loc	loc	both	both	both	both	both
1	loc	loc	loc	loc	loc	loc	loc	loc	loc	loc	sub	obj	sub	obj	sub
2	loc	loc	both	loc	loc	loc	loc	loc	LD	loc	sub	both	sub	obj	sub
3	loc	loc	loc	loc	loc	loc	loc	both	loc	loc	both	both	obj	obj	sub
4	loc	loc	loc	loc	loc	loc	loc	loc	loc	loc	sub	sub	sub	obj	sub
5	loc	loc	loc	loc	loc	loc	loc	loc	loc	loc	sub	sub	sub	sub	sub
6	loc	loc	loc	loc	loc	loc	loc	loc	loc	loc	obj	sub	sub	sub	sub
7	loc	loc	loc	loc	loc	loc	loc	loc	loc	loc	sub	sub	obj	obj	sub
8	loc	loc	loc	loc	loc	loc	loc	loc	loc	loc	obj	obj	sub	obj	sub
9	loc	loc	loc	loc	loc	loc	loc	loc	LD	loc	sub	sub	sub	sub	sub
10	loc	loc	loc	loc	loc	loc	loc	loc	loc	loc	sub	sub	sub	both	sub
11	loc	loc	loc	loc	loc	loc	loc	loc	loc	loc	sub	sub	sub	sub	sub
12	loc	loc	loc	loc	loc	loc	loc	loc	loc	loc	sub	sub	sub	obj	sub
13	loc	loc	loc	loc	loc	loc	LD	loc	loc	loc	sub	sub	sub	obj	sub
14	loc	loc	loc	loc	loc	loc	loc	loc	loc	loc	sub	sub	sub	obj	sub
15	loc	loc	loc	loc	loc	loc	loc	loc	loc	LD	sub	sub	sub	obj	sub
16	loc	loc	loc	loc	loc	loc	LD	loc	loc	loc	sub	sub	sub	sub	sub
17	loc	loc	loc	loc	loc	loc	loc	loc	loc	loc	sub	both	obj	obj	both
18	loc	loc	loc	loc	loc	loc	loc	loc	loc	loc	sub	sub	sub	obj	sub
19	loc	loc	loc	loc	loc	loc	loc	loc	loc	loc	sub	sub	sub	obj	sub
20	loc	loc	loc	loc	loc	loc	loc	loc	loc	loc	sub	sub	sub	sub	sub
21	loc	loc	loc	loc	LD	loc	both	loc	loc	loc	sub	sub	obj	obj	sub
22	loc	loc	loc	loc	loc	loc	loc	loc	loc	LD	sub	sub	sub	sub	sub
23	loc	loc	loc	loc	loc	loc	loc	loc	loc	loc	sub	sub	sub	sub	sub
24	loc	loc	loc	loc	loc	loc	loc	loc	loc	loc	sub	obj	sub	both	sub
25	loc	loc	loc	loc	loc	loc	loc	loc	loc	loc	sub	sub	sub	obj	sub

Note: loc=local binding, LD=long-distance binding, sub=subject, obj=object

**Appendix 9: Percentage of target responses for locality and orientation
for each low-intermediate learner**

Subjects (n=19)	Local binding in locality (%)		Orientation (Type 3, %)		
	Finite (Type 1)	Non-Finite (Type 2)	Subject binding	Object binding	Sub/Obj binding
1	100	60	100	0	0
2	80	60	80	20	0
3	100	100	80	20	0
4	100	100	100	0	0
5	100	100	80	20	0
6	100	80	40	40	20
7	100	40	80	20	0
8	100	60	60	40	0
9	100	100	0	100	0
10	100	100	60	40	0
11	60	80	60	20	20
12	60	100	60	0	40
13	100	80	80	20	0
14	80	60	100	0	0
15	60	40	60	40	0
16	60	60	80	20	0
17	100	0	100	0	0
18	100	100	80	20	0
19	80	40	80	20	0

Appendix 10: Percentage of target responses for locality and orientation for each intermediate learner

Subjects (n=26)	Local binding in locality (%)		Orientation (Type 3, %)		
	Finite (Type 1)	Non-Finite (Type 2)	Subject binding	Object binding	Sub/Obj binding
1	80	100	100	0	0
2	100	100	60	40	0
3	80	60	60	20	20
4	100	80	100	0	0
5	100	60	80	20	0
6	100	20	80	20	0
7	100	100	100	0	0
8	100	100	60	20	20
9	100	60	80	20	0
10	40	60	60	0	40
11	100	100	40	40	20
12	100	100	60	0	40
13	100	100	80	20	0
14	100	100	40	20	40
15	100	60	80	20	0
16	100	60	80	20	0
17	100	100	80	20	0
18	100	100	100	0	0
19	100	100	80	20	0
20	100	100	80	20	0
21	100	60	60	40	0
22	80	100	80	20	0
23	100	60	60	20	20
24	100	20	80	20	0
25	80	100	80	20	0
26	100	60	100	0	0

Appendix 11: Percentage of target responses for locality and orientation for each advanced learner

Subjects (n=25)	Local binding in locality (%)		Orientation (Type 3, %)		
	Finite (Type 1)	Non-Finite (Type 2)	Subject binding	Object binding	Sub/Obj binding
1	100	100	60	40	0
2	80	80	60	20	20
3	100	80	20	40	40
4	100	100	80	20	0
5	100	100	100	0	0
6	100	100	80	20	0
7	100	100	60	40	0
8	100	100	40	60	0
9	100	80	100	0	0
10	100	100	80	0	20
11	100	100	100	0	0
12	100	100	80	20	0
13	100	80	80	20	0
14	100	100	80	20	0
15	100	80	80	20	0
16	100	80	100	0	0
17	100	100	20	40	40
18	100	100	80	20	0
19	100	100	80	20	0
20	100	100	100	0	0
21	80	80	60	40	0
22	100	80	100	0	0
23	100	100	100	0	0
24	100	100	60	20	20
25	100	100	80	20	0

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