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SECOND LANGUAGE ACQUISITION OF REFLEXIVE BINDING BY NATIVE SPEAKERS OF SERBO-CROATIAN

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SECOND LANGUAGE ACQUISITION OF REFLEXIVE BINDING

ABSTRACT

This thesis examines the role of transfer of first (L1) language properties and access to knowledge of Universal Grammar in second language (L2) acquisition. Two empirical components are included: a study of the syntax of anaphora in Serbo-Croatian and an experimental study of second language acquisition of reflexive binding. Data from field work on the coreference properties of anaphors in Serbo-Croatian are discussed in terms of standard, parameterized, LF movement, and Relativized SUBJECT approaches to Binding Theory. Recent versions of the theory identify a categorial distinction between morphologically simple (X^0) and complex (XP) anaphor types as a crucial factor in determining coreference relations between reflexive pronouns and their syntactic antecedents.

The predictions of a morphological approach to the Binding Theory were tested in a study of the acquisition of the binding properties of English XP reflexives by native speakers of Serbo-Croatian, a language with X^0 reflexives. Acquisition of the English binding pattern by this group of L2 learners requires recognition of the morphological complexity of English reflexives. Prior to reanalysis, learners are predicted to produce an incorrect L1 coreference pattern in the L2 environment.

Two sentence comprehension tasks were administered to adolescent and adult Serbo-Croatian speaking L2 learners of English and similar groups of English native speaker controls. Picture identification and multiple choice comprehension tasks produced convergent results with significant differences between control (n=47) and L2 learner (n=73) interpretations of reflexives in complex noun phrases and object control infinitival sentences. Their pattern of interpretation shows evidence of transfer of the X° anaphor type found in Serbo-Croatian to the target grammar and suggests L2 learners are able to apply a deductive system constrained by Universal Grammar to compute binding domains in second language acquisition.

Résumé

Cette thèse examine le rôle que jouent l'accès à la Grammaire Universelle et le transfert de propriétés de la langue maternelle en acquisition d'une langue seconde. La question est abordée à travers l'étude de la syntaxe de l'anaphore en serbo-croate et la façon dont les apprenants d'une deuxième langue acquièrent le système de liage des pronoms réflexifs. Des données fournies par les recherches sur la coréférence des anaphores en serbo-croate sont examinées selon diverses analyses de la Théorie du Liage, dont l'analyse standard et les approches en termes de paramètres, mouvement en forme logique et SUJET relativisé. Certaines versions récentes de la théorie font appel à une distinction catégorielle entre les anaphores simples (X^0) et complexes (XP) afin de déterminer les relations de coréférence entre les pronoms réflexifs et leurs antécédents syntaxiques.

Une telle approche de la Théorie du Liage peut avoir plusiers conséquences au niveau de l'acquisition d'une seconde langue. Celles-ci ont fait l'objet d'une étude expérimentale impliquant des personnes de langue maternelle serbo-croate (qui contient des pronoms réflexifs de type X^0) apprenant l'anglais, langue à pronoms réflexifs de type XP. L'acquisition des propriétés de liage en anglais par ces apprenants repose sur la découverte de la complexité morphologique des pronoms réflexifs dans cette langue.

Avant de parvenir à une nouvelle analyse, il est raisonnable de penser que les apprenants utilsent le système de coréférence de leur langue maternelle pour rendre compte, incorrectement, de faits de la langue seconde.

Deux tests de compréhension syntaxique ont été distribués à des adolescents et des adultes parlant le serbo-croate et apprenant l'anglais comme deuxième langue, ainsi qu'à des personnes de langue maternelle anglaise de mêmes tranches d'âge servant de cas témoins. Les résultats obtenus dans des tests de compréhension à choix multiple et à identification d'image sont convergents. Ils font état d'une différence significative entre la manière dont les témoins (n=47) et les apprenants (n=73) interprètent les pronoms réflexifs dans des syntagmes nominaux complexes et dans des phrases infinitves à contrôle de l'objet ("object control"). Le système d'interprétation des ces apprenants montre que ceux-ci tranfèrent l'anaphore de type X° de leur langue maternelle dans la grammaire qu'ils essaient d'apprendre. Ceci suggère que les apprenants d'une seconde langue sont à même d'utilser des systèmes de déduction régis par la Grammaire Universelle pour fixer les domaines de liage de la langue à acquérir.

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This thesis is dedicated to the people of Mostar.

List of Abbreviations

AGR =	Agreement
BT =	Binding Theory
COMP =	Complementizer
CP =	Maximal projection of COMP
DET =	Determiner
ESL =	English as a second language
I/INFL =	Inflectional node
IP =	Maximal projection of INFL; clause marker
L1 =	First language
L2 =	Second or subsequent language
MDS =	Minimal Distance Strategy
N =	Noun
NP =	Noun phrase
PP =	Prepositional phrase
pro =	null pronoun
PRO =	null anaphoric pronoun
SPEC =	Specifier
UG =	Universal Grammar
V =	Verb
VP =	Verb phrase
X° =	Head
XP =	Maximal projection

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Chapter 1

OVERVIEW

1.0. Introduction

This thesis examines various theories of anaphoric binding that have been proposed within the Principles and Parameters framework of generative grammar (Chomsky 1981, 1986) and applies them to the study of second language acquisition.[1] The predictions of several alternative theories for linguistic variation and language acquisition are reviewed in light of previous research and the data reported here.

Two research components contribute to this thesis. The syntactic component reports data from a field study of Serbo-Croatian anaphora. The results of the syntax study indicate that antecedents for reflexive pronouns in Serbo-Croatian may occur in a wider syntactic domain than those found in English. Analysis of the syntactic facts that account for differences in domain restrictions on reflexives in these two languages forms the basis of hypotheses tested in the experimental component of this research.

Using two types of sentence comprehension tasks, the acquisition study examines the interpretation of English reflexive pronouns by native speakers of Serbo-Croatian. The results of this study show that L2 learners interpret reflexives in ways consistent with Universal Grammar (UG)

and resort to a UG-constrained deductive system to compute domains for reflexive-antecedent coreference in the target grammar. Further, the pattern of reflexive interpretation of these L2 learners indicates that transfer of L1 knowledge of the morphological structure of reflexives may crucially influence the grammar of anaphora present in the developing L2 grammar.

1.1. Linguistic Theory and the Theory of Acquisition

In generative linguistics, it is assumed that certain properties of language must be innately present in order to account for the acquisition of complex grammatical knowledge which is underdetermined by the linguistic input available to the child. Chomsky (1965:58) discusses this fundamental problem of the "poverty of the evidence":[2]

> A consideration of the character of the grammar that is acquired, the degenerate quality and narrowly limited extent of the available data, the striking uniformity of the resulting grammars, and their independence of intelligence, motivation, and emotional state, over wide ranges of variation, leave little hope that much of the structure of the language can be learned by an organism initially uninformed as to its general character.

The research program in generative linguistics in the past three decades has been driven by the problem of developing a theory of the innate knowledge of language that extends the range and type of linguistic information available to the child from the environment and yet restricts the range of possible grammars acquired by the

child to the finite number of possible human languages. Although sufficiently precise characterization of the contents of the innate structure, known as Universal Grammar, has only been accomplished in the last 15 years, development of linguistic theory and acquisition theory were conceptually linked much earlier. Chomsky (1965:27-28) makes this explicit:

> A theory of linguistic structure that aims for explanatory adequacy incorporates an account of linguistic universals, and it attributes tacit knowledge of these universals to the child. It proposes, then, that the child approaches the data with the presumption that they are drawn from a language of a certain antecedently well-defined type, his problem being to determine which of the (humanly) possible languages is that of the community in which he is placed.

and concludes,

> ...the main task of linguistic theory must be to develop an account of linguistic universals that, on the one hand, will not be falsified by the actual diversity of languages and, on the other, will be sufficiently rich and explicit to account for the rapidity and uniformity of language learning, and the remarkable complexity and range of the generative grammars that are the product of language learning.

Much of the work of specifying the content of Universal Grammar has followed from the perspective offered by the introduction of the Principles and Parameters framework of Government-Binding theory (Chomsky 1981). This approach not only shifted generative linguistics away from specification of rule systems characteristic of earlier transformational accounts to more explicit generalizations about the universal principles and parametric variation that guide

acquisition and determine the range of variation among languages, but provided acquisition theorists with a set of testable hypotheses about how language is acquired.

Universal Grammar consists of a set of universal principles that hold across languages as well as a finite set of parameterized principles that account for variation among languages. Further, it is argued (Chomsky 1986a:149ff) that the range of options presented by UG parameters is narrowly restricted. The content and operation of Universal Grammar guarantees that a child entertains only a limited range of possible grammars in the course of first language acquisition.[3] UG is thus a characterization of the child's innate knowledge of language. Experience, in the form of sentences of the language being acquired, fixes the parameters of UG and provides the raw material for acquisition of the lexicon and peripheral aspects of the grammar which, taken together, form the adult native speaker's linguistic competence.[4]

The extent to which data from studies of child grammars confirm or disconfirm the theory of UG has been the subject of vigorous research in L1 acquisition. Collected studies and research by Baker and McCarthy (1981), Goodluck and Solan (1978), Hornstein and Lightfoot (1981), Hyams (1986), Lust (1986), Matthews and Demopoulos (1989), Otsu, et al. (1983), Tavakolian (1981), Weissenborn, Goodluck and Roeper (1992), and Wexler and Culicover (1980) reflect theoretical

conceptualizations of Universal Grammar as well as specification of fully developed adult grammars of particular languages. Thus in child acquisition studies, the learnability constraint that is built into the evaluation of particular grammars is subject to empirical verification. Tavakolian (1981:vii) depicts the interactive relationship between linguistic theory and child language acquisition research:

> Linguistic theory provides a general framework within which data from child language can fruitfully be analyzed. Theoretical considerations can unify otherwise disparate and seemingly unrelated data from language acquisition studies to provide a uniform account of children's linguistic knowledge. Conversely, theories of language acquisition constrain proposals about adult grammars by requiring that adult grammars be learnable within a relatively short period of time, that theories of adult language be consistent with what is known about children's acquisition of language, and that the acquisition process not depend on impossible learning procedures.

This confidence in the value of child acquisition data to the refinement of linguistic theory is not shared by all generativists, including those working in the field of L1 acquisition. Lightfoot (1982), for example, restricts the use of child acquisition data to confirmatory status. However, the growing sophistication of linguistic theory increasingly offers more precise proposals about the nature and operation of Universal Grammar and the way that instantiated UG knowledge functions in a fully-articulated adult grammar. As acquisition theory and the methodologies

used in acquisition research also become more precise, the direct application of the results of child acquisition research to linguistic theory becomes increasingly viable, and the characterization of child acquisition as a laboratory for linguistic theory more plausible.

1.2. Linguistic Theory and Second Language Acquisition

In recent years, there has been growing interest in the applicability of the Principles and Parameters framework to research in second language acquisition. Motivation for the use of UG theory in L2 acquisition research stems from recognition of the fact that properties of the target grammar are also underdetermined by the linguistic input in L2 acquisition, and the implication that the grammars of successful learners of second languages could not have been acquired on the basis of exposure to the ambient language alone. The logical problem of second language acquisition (Bley-Vroman 1989; White 1985; Zobl 1983) has prompted much heated debate about the role of Universal Grammar in second language acquisition.

Developments in linguistic theory have also influenced the growth of UG-based research on L2 acquisition. Research on linguistic variation particularly lends itself to consideration of the effects of L1-instantiated principles and parameter settings on the development of L2 grammars. As in L1 acquisition research, the precise nature of current

UG analyses provides the basis for specific hypotheses about the form and content of UG-based knowledge of the target grammar.

However, several considerations, such as apparent differences between L1 and L2 acquisition, have raised concerns about the relevance of UG theory to L2 acquisition. These differences involve issues of ultimate attainment in L1 and L2 acquisition, the effect of age on L2 acquisition, the role of the L1 grammar in child and adult L2 acquisition, and the cognitive maturity of adolescent and adult L2 learners.

Differences in the level of attainment reached by L2 learners as opposed to L1 learners are frequently cited as an indication of fundamental differences in the learning processes involved (Bley-Vroman 1989). However, as White (1989a) notes, "It is not sufficient to point to error-ridden second language performance and argue that this is evidence against the operation of UG." Errors in language-specific properties do not bear on the question of whether or not UG is available to L2 learners. The question of whether UG constrains L2 acquisition can only be answered through investigation of UG-constrained aspects of the grammars of L2 learners. In fact, the type of errors produced by L2 learners typically do not involve UG violations (White 1988a).

The emerging pattern of research findings seems to indicate that UG is available though perhaps not in the same way it is available to the L1 learner. A substantial number of studies of UG in second language acquisition indicate that L2 learners acquire subtle knowledge of the target grammar which is neither available from the L1, nor capable of being induced from the input (Flynn 1987; Ritchie 1978; Thomas 1991b; White 1988a, among others). However, the status of UG in L2 acquisition is by no means unequivocal. Studies by Clahsen and Muysken (1986) and Schachter (1988) provide evidence against the claim that UG is available to L2 learners, results of experiments by Bley-Vroman, Felix and Ioup (1988) and Clahsen and Muysken (1989) suggest that UG is only partially available, and Schachter (1989) argues that only L1-instantiated UG information is available to the L2 learner. Hilles (1991) and Lee (1992) suggest that UG may be accessible to children learning an L2, but not to adults. In discussing the overall research picture, White (1989a: 173ff.) asserts that while the "pure UG hypothesis" of identity between L1 and L2 access to UG is not supported by the research, the hypothesis that UG is totally inaccessible in L2 acquisition is equally untenable. What does seem clear is that empirical research supports the contention that UG is accessible under some conditions in L2 acquisition. This does not imply that UG is only accessible via the L1, nor that it is only available in a degenerate form. The nature

of access to UG in child, adolescent, and adult acquisition remains a question that can only be answered through further research that examines the underlying grammatical knowledge of the L2 learner. Gregg (1989) and Newmeyer and Weinberger (1989) stress the importance of developing a research program that investigates the operation of UG in second language acquisition.

In addition to providing a characterization of the linguistic competence of L2 learners, use of the UG model in L2 acquisition may have other empirical advantages. Schwartz (1991:281) argues that the explicitness of UG constraints on grammars results in a greater falsifiability of UG-based hypotheses about L2 acquisition than of hypotheses derived from general learning theories or processing accounts proposed by Bates, et al. (1982), Meisel (1991), and others.

The potential contribution of L2 data to linguistic theory has also been compared to that of L1 data. Cook (1981) suggests that data from L2 studies may actually reveal more about language than L1 data since adult cognitive skills are not rapidly evolving, as they are in children. In the adult L2 learner, mechanisms of linguistic development can more readily be isolated from changes that results from cognitive development.

Gass and Ard (1980) argue that L2 data can be used to select among competing linguistic theories. Extension of this claim to competing theories of acquisition has been

made by Schwartz (1993) who used L2 developmental sequence data to determine the validity of the UG-based model as opposed to a problem-solving approach to L2 acquisition. The more modest claim that data from second language acquisition can be used to verify, or elucidate, properties of UG principles and parameters has also been proposed by Flynn (1988), Gass (1993), Lust (1988), and is implicit in conclusions by White (1985, 1990). The complementary relationship of linguistic theory and L2 acquisition theory is summed up by White (1992:285):

> On the assumption that interlanguages are natural languages, L2 acquisition provides a source of data that can be used in support of linguistic theories, on a par with other data.

1.3. Organization of the Thesis

The thesis is organized along the following lines. Chapter 2 introduces the module of Universal Grammar known as the Binding Theory and data on anaphoric binding in the languages relevant to the acquisition study. The English binding facts and the results of field research on anaphoric binding in Serbo-Croatian are described in this chapter. Several empirical problems associated with the standard version of the Binding Theory are discussed.

Chapter 3 presents alternative approaches to the theory, including the parameterized approach of Wexler and Manzini (1987), LF movement analyses (Battistella 1987; Cole, et al. 1990; Pica 1987; Huang and Tang 1989, among

others) and the Relativized SUBJECT approach of Progovac (1992) and Progovac and Franks (1992). The parameterized approach, the theoretical framework for nearly all previous UG research, and arguments discounting this analysis are presented.

The LF movement and Relativized SUBJECT approaches represent two current BT analyses that correlate domain and antecedent orientation with the morphological complexity of anaphors. Empirical and theoretical problems of the LF movement approach are discussed. The Relativized SUBJECT analysis used as the theoretical framework in the acquisition study is presented and the descriptive adequacy of this approach across languages is examined in some detail.

Chapter 4 reviews research on the acquisition of reflexive binding by first and second language learners. The chapter introduces learnability issues addressed in acquisition research and the learning mechanism known as the Subset Principle (Berwick 1985; Wexler and Manzini 1987). Studies of L1 and L2 acquisition cf reflexive binding are discussed in terms of the Subset Principle and the parameterized version of the Binding Theory. Arguments against the use of this theoretical framework are presented. Research conducted in LF movement and Relativized SUBJECT frameworks is also reviewed, and the empirical verification of the Relativized SUBJECT analysis is examined.

Chapter 5 reports a study of the acquisition of English reflexive binding by native speakers of Serbo-Croatian. It introduces the hypotheses tested in this research and specifies the predictions of each hypothesis. Experimental design and results are reported with details of subject population, data collection procedures, test instruments, and statistical analyses. Aggregate and individual subject results are evaluated in terms of the hypotheses.

Chapter 6 discusses the implications of the findings for future research.

NOTES

1. In this thesis, the terms "language acquisition" and "language learning" will be used to refer to the same process (cf. Krashen 1981). Second (L2) acquisition refers to acquisition of a language (L2, L3, L4...) following acquisition of the first (L1) or native language(s). Simultaneous acquisition of more than one L1 will be described as bilingual acquisition.

2. This classic problem of the "poverty of the stimulus" or "poverty of the evidence" (Chomsky 1986a:7) has also been referred to as the "projection problem" (Peters 1972), the "logical problem of language acquisition" (Hornstein and Lightfoot 1981, Baker and McCarthy 1981), or "Plato's problem" (Chomsky 1986a).

3. This is to say that children do not adopt "wild grammars" (Goodluck 1986) which violate principles of UG. Developing grammars are thus natural languages (White 1981). The same claim has been made for second language acquisition. Developing L2 grammars, or "interlanguage" grammars (Selinker 1972), fall within the range of possible human languages.

4. Chomsky (1965:4) distinguishes the mental representation of a speaker's knowledge of language, or linguistic "competence," from linguistic behavior, which is referred to as "performance."

Chapter 2

ANAPHORS IN SERBO-CROATIAN AND THE SYNTAX OF REFLEXIVE BINDING

2.0. Introduction

One of the goals of current linguistic research is to provide a theory of coreference based on principles and parameters of Universal Grammar, rather than on language-specific sets of rules. The Binding Theory (Chomsky 1981, 1986a) identifies three categories of nominal expressions: anaphor, pronominal, and R-(referring) expression, and establishes a set of antecedent requirements and locality conditions to account for noun phrase (NP) coreference facts found in natural languages.

As originally construed (Chomsky 1981), the Binding Theory fails to predict the behavior of certain cases of apparently unbounded anaphora in a number of languages including Chinese (Battistella 1987, 1989; Cole, Hermon and Sung 1990; Huang and Tang 1989; Tang 1989), Japanese (Fukui 1984; Katada 1991), Russian (Klenin 1974; Rappaport 1986; Růžička 1973; Timberlake 1979), Icelandic (Thráinsson 1976, 1979; Maling 1984), Norwegian (Hellan 1988), Danish (Vikner 1985), Dutch (Everaert 1986; Reuland 1989), and Italian (Giorgi 1984). Assuming anaphor-antecedent relations are constrained by universal principles, recent research has attempted to account for the full range of binding facts through revision of the Binding Theory and formulation of a

unified theory of conditions governing the dependency relation that holds between NP elements in a sentence that refer to the same entity.

A number of different approaches have been pursued: (1) parameterization of the locality domain in which an anaphor must find an antecedent (Johnson 1984; Manzini and Wexler 1987; Yang 1983), (2) introduction of thematic structure into Binding Theory (Reinhart and Reuland 1991; Reuland 1989; Williams 1989), (3) relativization of the notion of SUBJECT (Progovac 1992; Progovac and Franks 1992), (4) classification of long-distance anaphors as logophors (Kameyama 1984; Reinhart and Reuland 1991; Sells 1987), (5) classification of anaphors as operators and non-operators (Katada 1991), and (6) application of general movement constraints to the interpretation of anaphor-antecedent relations (Chomsky 1986a; Cole, Hermon and Sung 1990; Huang and Tang 1989; Lebeaux 1983; Pica 1987). Generally, these approaches either introduce parameters and thus enrich the theory or apply principles from other modules of UG to coreference relations in order to maintain a unified and restrictive theory of binding.

The purpose of this chapter is to present a description of the coreference properties of Serbo-Croatian anaphora and to determine the consequences of these binding facts for standard Binding Theory. This component of the thesis is based on field research which serves as a syntactic base for

the experimental study. Since data on the binding properties of Serbo-Croatian reflexives and reciprocals were extremely sparse in the literature, it was necessary to collect new data on anaphors in Serbo-Croatian. These data were obtained in informant interviews and by written questionnaire. Extensive interviews were conducted with 5 speakers of the (jekavski variant) dialect of Mostar (Bosnia-Hercegovina), 4 speakers of the Serbo-Croatian (ekavski variant) dialect of Belgrade (Serbia), 2 speakers of the (ekavski variant) dialect of the province of Vojvodina (northern Serbia), and one speaker of the (jekavski variant) dialect of Zagreb (Croatia). In addition, 25 Mostar dialect native speakers provided information about Serbo-Croatian binding in two written formats: a grammaticality judgement test (n=13, May 1989) and a questionnaire (n=12, July 1991) that requested both grammaticality judgements and translation.

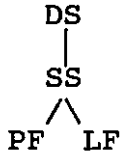
The chapter is organized as follows: In Section 2.1., standard Binding Theory (Chomsky 1981; 1986a) is introduced. Section 2.2. provides a description of the lexical anaphors in Serbo-Croatian. Discussion of anaphoric binding in Serbo-Croatian focuses on antecedent selection in Section 2.3. and domain restrictions in Section 2.4. Section 2.4. concludes with a summary of the properties of Serbo-Croatian binding as determined within the framework of standard Binding Theory and identifies areas of the grammar that are not accounted for by standard theory.

2.1. Standard Binding Theory

2.1.1. Government-Binding Theory

The model of Universal Grammar (UG) known as Government-Binding (GB) theory (Chomsky 1981, 1986a, 1986b) posits the following levels of representation:

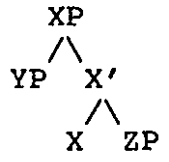
(1)



These levels express relations among syntactic constituents and include D-structure (DS), the level at which individual lexical items are combined and semantically relevant thematic relations and grammatical functions are directly represented; S-structure (SS), derived from DS by movement of syntactic categories; Phonetic Form (PF), the level at which phonological structures are directly expressed; and Logical Form (LF) (Chomsky 1980; May 1985) where the semantic properties of the syntactic structure are represented. Processes constrained by Universal Grammar generate the output structures at each level of representation.

Lexical and functional items are projected from the lexicon to the level of D-structure (DS) according to the Projection Principle (Chomsky 1981:29,38) and configurational constraints imposed by principles of X-bar Theory which has the following structural schema:

(2)



In this schema (Chomsky 1986b:2-3), X (or X^0, a zero-level category) is a head, and XP (or X^{max}, a phrasal category) is a maximal projection of a head. ZP is the complement of X, and YP is the specifier.

Two types of categories are represented in this schema, lexical and functional. Lexical categories (Chomsky 1986b:2) are defined in terms of the features [±N,±V] which yield Noun [+N,-V], Verb [-N,+V], Adjective [+N,+V], and Preposition-Postposition [-N,-V]. Functional categories include Complementizer (COMP), Determiner (DET) (Fukui and Speas 1987; Abney 1987) and INFL which includes Agreement (AGR) and Tense elements (Iatridou 1990). Phrasal categories are maximal projections of zero-level lexical or functional categories. Notions of subject and object are relational, not categorial, so that in (2), if XP is a maximal projection of a Verb, a Verb Phrase (VP), then the specifier YP is the subject of X, and the complement ZP is the object.

In the grammatical model shown in (1), S-structure (SS) is derived from D-structure by Move-α. Instantiations of Move-α include NP-movement, head movement, and other constituent movement. Phonological rules yield the level of Phonetic Form (PF) and rules of semantic interpretation,

such as those governing scope of operators, apply at the level of Logical Form (LF). Structures are restricted by subtheories of Universal Grammar in the course of the derivation and at each level of representation. These subtheories, or modules, of Universal Grammar include Theta Theory, Government Theory, Bounding Theory, Binding Theory, Case Theory, and Control Theory (Chomsky 1981:5). Of particular interest in this thesis are Government Theory, which specifies dominance relations between constituent elements, Bounding theory, which restricts movement of constituents, Control Theory, which determines the antecedents of pronominal empty categories (i.e., PRO and pro), and Binding Theory, which defines coreference relations between identical noun phrases in sentences. In Section 2.1.2., standard Binding Theory as described in Chomsky (1981, 1986a) will be introduced.

2.1.2. Binding Theory

The Binding Theory (BT) establishes a set of conditions which govern the interpretation of nominal elements in sentences. These principles specify the structural domain in which lexical anaphors (reflexives, reciprocals), pronominals (pronouns), and R-expressions (eg.Ivan, house, etc.) may be bound to an antecedent (Chomsky 1981:188):[1]

(3) (A) An anaphor is bound in its governing category
(B) A pronominal is free in its governing category
(C) An R-expression is free

A nominal element may be bound[2] by (i.e., coindexed with and c-commanded by) or free from an antecedent in an A-(Argument) position. An A-position is a D-structure position that can potentially receive a theta-role (Chomsky 1981:47). C-command is defined (cf. Reinhart 1976, 1981) as follows:

(4) ß *c-commands* α if and only if
(i) α is dominated by the first branching node that dominates ß;
(ii) ß is not identical to α;
(iii) neither α nor ß dominates the other.

BT coindexation is a representation of referential dependency. NPs are freely coindexed, and the binding principles apply to the resulting structure. In this version of Binding Theory, an eligible NP antecedent must c-command an anaphor and occur within the same governing category. The governing category specifies the local binding domain (Chomsky 1981:211ff.):

(5) ß is a governing category for α if and only if ß is the minimal category containing α, a governor of α, and a SUBJECT accessible to α.

(i) $*[_{\gamma}...\delta...]$, where γ and δ bear the same index

(ii) α is accessible to ß if and only if ß is in the c-command domain of α and assignment to ß of the index of α would not violate [the *i*-within-*i* condition, i.e., (i)]

Applying this definition, the governing category for nominal α is the minimal NP or IP containing the nominal expression, a governor for the nominal, and a SUBJECT ([NP,IP], [NP,NP], or AGR). SUBJECT denotes "the most prominent nominal element" (Chomsky 1981:209), including the overt lexical or null (pro) subject of a finite clause, the

null subject (PRO) of an infinitival clause, the lexical subject of an NP, the subject of a small clause, and AGR, the nominal agreement element of INFL. In Chomsky (1986a:169), the definition of governing category was revised and the notion of "complete functional complex" was introduced.

(6) a. A governing category of α is a maximal projection containing α, a governor of α, and a subject.

b. A governing category is a 'complete functional complex'(CFC) in the sense that all grammatical functions compatible with its head [i.e. the subject and the complements] are realized in it.

This modification of standard theory eliminates some empirical problems, permitting an account of apparent counterexamples in which both an anaphor and a pronoun may appear in the same structural position (Huang 1982:324):[3]

(7) a. The men$_i$ saw [their own/each other's$_i$ pictures]

b. The men$_i$ saw [their$_i$ pictures]

Although INFL (and thus AGR) governs the subject of an IP, and AGR is coindexed with the subject for purposes of agreement, AGR does not function as SUBJECT in revised standard theory (Chomsky 1986a:177).

The notion of government is defined as: (Chomsky 1981:165)

(8) $[_\phi \ldots\gamma\ldots\alpha\ldots\gamma\ldots]$,
(i) $\alpha = X^0$
(ii) where ϕ is a maximal projection, if ϕ dominates γ then ϕ dominates α
(iii) α c-commands γ

That is, "a category α *governs* a maximal projection X'' if α and X'' c-command each other" (Chomsky 1986a:162). Further, if α governs XP, then it also governs Specifier and head of XP. A head governs its complements. Assuming NP = $[_{NP}Det[_{N'}N...]]$, in $[_{VP}V$ NP], V governs NP, Det, and N. Governors include lexical categories and their projections (N, NP, V, VP, P, PP) and the AGReement element of INFL which has the nominal features person, gender, and number. Standard BT (Chomsky 1981:211; 1986a:162) assumes the agreement element AGR of INFL not only functions as a governor, but is coindexed with the NP subject it governs.

Applying this set of revised standard BT definitions to core cases, we find that the immediate clause (IP) is the governing category for an NP subject of a tensed sentence; IP is also the governing category for a verbal NP complement or an NP object of a PP complement of a verb. NP is the governing category for an NP contained in a PP complement of a noun, assuming the NP has a subject. The Binding Theory (Chomsky 1986a) thus accounts for the following series of contrasts in sentences containing reflexives in English:

(9) a. **Mary** described **herself**
b. **Mary** heard [a description of **herself**]
c. **Mary** heard [**John's** description of ***herself/himself**]
d. **Mary** wants [**John** to describe ***herself/himself**]
e. **Mary** forced **John** [PRO to describe ***herself/himself**]
f. **Mary** said [that [**John** described ***herself/himself**]]
g. **Mary** said [that[[**John's** picture of ***herself/himself**] was sold by auction.
h. Mary said[that[[**John's** picture of ***herself/himself**]] was sold by **Kitty**.

(Coreference is shown in bold format in example (9).)

The governing category for the reflexive in (9a) is the matrix sentence, a CFC which contains a subject (Mary) and a governor for the reflexive, the verb. The matrix sentence is also the governing category for the reflexive in (9b); the noun phrase lacks a subject and therefore is not a CFC. In (9c), the noun phrase has a lexical subject and the reflexive is governed by the preposition (of); the reflexive therefore must be bound to an antecedent within the complex noun phrase (CPNP)[4] by Principle A of the Binding Theory (See eg.(3)). An Exceptional Case Marking (ECM) verb occurs in the matrix clause in (9d). In this case, the embedded infinitival clause is the CFC governing category for the reflexive; John is the subject of the embedded clause and the verb describe governs the reflexive. The reflexive may thus refer to John, but not to Mary, by Principle A. The embedded infinitival clause is also the CFC governing category in (9e); therefore, the antecedent for the reflexive must occur within the infinitival clause. The subject of the embedded infinitival clause is the empty nominal element PRO which is assigned coreference with the direct object John in the matrix clause under the independent process of control. The PRO antecedent for the reflexive is therefore coindexed with John, and coreference with Mary is ruled out by Principle A. In (9f) the subject of the embedded finite clause is John and the verb describe governs the reflexive. The only possible antecedent for the

reflexive is John, since Mary occurs outside the CFC governing category. In (9g) and (9h), the reflexive occurs within the CFC subject of the embedded clause. The reflexive is governed by the preposition of and the subject is the genitive NP in Specifier position, the [NP,NP] subject of the complex noun phrase. In these sentences, the reflexive must be bound within the complex noun phrase; thus the only possible antecedent is John.

2.2. Anaphors in Serbo-Croatian

Serbo-Croatian anaphors include: the reflexive personal pronoun (sebe), the reflexive possessive pronoun (svoj), and the reciprocal pronoun (jedan drugoga). The morphology and syntax of these anaphors are introduced in this section.

2.2.1. Reflexive Anaphors

2.2.1.1. Reflexive Pronoun

The reflexive pronoun sebe (self) is not morphologically sensitive to the grammatical person, number, or gender of its referent.[5] It does not occur in Nominative or Vocative case, but appears in Accusative (sebe), Genitive (sebe), Locative (sebi), Dative (sebi), and Instrumental (sobom) forms (Hawkesworth 1986:92). The citation form is Accusative.[6] (Coreference possibilities are indicated with subscripts, the asterisk denotes impossibility of coreference.)

(10) Milan je video sebe u ogledalu
Milan-NOM be-3s saw self-ACC in mirror-LOC
Milan$_i$ saw himself$_i$ in the mirror

The clitic form (se) alternates with full form, sebe, in most reflexive constructions:

(11) Milan se (je) video u ogledalu
Milan-NOM self-ACC be-3s saw in mirror-LOC
Milan$_i$ saw himself$_i$ in the mirror

The clitic form is not inflected for the person, number, or gender of its referent. It occurs in the Accusative and Dative as se.[7] The clitic form is ungrammatical following prepositions and thus does not occur in oblique cases:

(12) (Ona)[8] govori stalno o sebi/*se
(She-NOM) talk-3s always about self-LOC
She$_i$ always talks about herself$_i$

Particularly when used with inherent reflexive verbs, use of the full form is often contrastive or emphatic (Bidwell 1965-66):

(13) a. Jovan se pere
John-NOM self wash-3s
John$_i$ is washing himself$_i$

b. Jovan pere sebe
John-NOM wash-3s self-ACC
John$_i$ is washing himself$_i$ (emphatic)

Although sebe is limited to fully reflexive contexts, se also occurs in certain passive and intransitive constructions which are beyond the scope of this discussion (cf. Bidwell 1965-66; Browne 1993; Hadžiselimović 1970). For purposes of this study, discussion will focus on the independent reflexive sebe.

2.2.1.2. Reflexive Possessive Pronoun

The reflexive possessive pronoun svoj (self's, one's own) has no direct counterpart in Modern English,[9] but occurs in Modern Scandinavian languages (Hellan 1988; Maling 1986) and Slavic languages (Klenin 1974; Mihaljević 1990; Rappaport 1986; Reinders-Machowska 1991; Toman 1991). Although Serbo-Croatian svoj does not agree morphologically with its referent, it is fully inflected as a modifier for gender, number, person, and case. (egs. (14a) Browne 1993, (14b) Mihaljević 1990:145)

(14) a. Slavko govori o **svojem** konju
Slavko-NOM talks about self's-masc-s-LOC horse-masc-s-LOC
Slavko$_i$ talks about his own$_i$ horse

b. Janko daje Marku **svoju** knjigu
Janko-NOM gives Mark-DAT self's-masc-s-ACC book-masc-s-ACC
Janko$_i$ is giving Mark$_j$ his own$_{i/*j}$ book

Nominative use of the possessive reflexive is limited to idiomatic expressions: (Hawkesworth 1986:144)

(15) On je **svoj** čovjek
He-NOM be-3s self's-NOM man-NOM
He$_i$ is his own$_i$ man

The reflexive possessive functions syntactically as Specifier of NP; for example, [$_{NP}$[$_{SPEC}$Svojem][$_{N'}$[$_{N}$životu]]]:

(16) Ivan je govorio o **svojem**[10] životu
Ivan-NOM be-3s talked about self's-LOC life-LOC
Ivan$_i$ was talking about his own$_i$ life

2.2.2. Reciprocal Pronoun

The Serbo-Croatian reciprocal pronoun is morphologically, and syntactically, more complex than the reflexive pronouns. Each component of the reciprocal pronoun jedan drugoga (one another, each other) is individually assigned gender, number, and case. Case marking on the components of the reciprocal reflect both sensitivity to the referent and the argument structure of the verb[11] (NOM, ACC, GEN, LOC, DAT, INSTR). The citation form is (masculine, singular) Nominative-Accusative. Although speakers frequently overgeneralize the masculine form, as shown in (17b), feminine and neuter forms also occur. Neuter forms may indicate mixed gender groups.

(17) a. (Oni) vide jedan drugog(a)
(they-3m-NOM) see-3p each-ms-NOM other-ms-ACC
They$_i$ see each other$_i$

b. Djeca vole jedan drugog(a)
children-3n-NOM love-3p each-ms-NOM other-ms-ACC
The children$_i$ love each other$_i$

c. Djeca vole jedno drugo
children-3n-NOM love-3p each-ns-NOM other-ns-ACC
Children$_i$ love each other$_i$

In prepositional phrases, the preposition is inserted between the two components of the reciprocal:

(18) a. Djeca misle jedno o drugom(e)
children-NOM think-3p each-ns-NOM about other-ns-LOC
The children$_i$ are thinking about each other$_i$

b. Žene zavise jedna od druge
women-NOM depend-3p each-fs-NOM on other-fs-GEN
Women$_i$ depend on each other$_i$

The same pattern occurs in Russian (Rappaport 1986:98):

(19) Deti dumajut drug o druge
children-NOM think-3p each about other-LOC
The children$_i$ are thinking about each other$_i$

Rappaport (1986) suggests that the Russian reciprocal functions as a "continuous lexical unit" despite the fact that prepositions can intervene. He points out two properties of the Russian reciprocal which distinguish it from the syntactically discontinuous Italian reciprocal l'uno...l'altro discussed by Belletti (1982). First, the two components of the Italian reciprocal cannot occur together, or thus function as a verbal complement, as in Serbo-Croatian (See eg.(17)) and Russian (eg.(19)). In addition, other lexical categories, including noun and adjective, can split the Italian reciprocal. The only element which can occur in this syntactic position in Russian and Serbo-Croatian is a preposition, as shown in the Serbo-Croatian example below.

(20) *Djeca vole jedno mnogo drugo
children-NOM love-3p each-ns-NOM a lot other-ns-ACC
The children$_i$ love each other$_i$ a lot

Number agreement with the clausal subject and/or verbal NP complement follows the pattern shown in (21), although generic nouns, such as the children, and plural pronouns take both singular and plural reciprocal forms. Generally, singular forms refer to two referents and the plural forms to groups larger than two.

(21) a. Ivan i Petar su me pitali jedan o drugom(e)
[Ivan-NOM and Peter-NOM]$_i$ be-3p me-ACC asked
one-ms-NOM about other-ms-LOC$_i$
Ivan and Peter asked me about each other

b. Novinari su rekli političarima laži **jedni o drugim(a)**
journalists$_i$-NOM be-3p told politicians$_j$-DAT lies-ACC each-np-NOM about other-np-LOC$_{i\&j}$
The journalists told the politicians lies about each other

Case agreement may also be present. As shown in example (22), the first element in the reciprocal may independently agree with the case of the verbal NP complement.

(22) a. Petar je lagao Kristini i Suzani **jednoj o drugoj**
Peter-NOM be-3s lied [Kristina-DAT and Susan-DAT]$_i$ to-one-fs-DAT about to-other-fs-DAT$_i$
Peter lied to Kristina and Susan about each other

b. Ja sam pitao Ivana i Petra **jednog o drugom(e)**
I-NOM be-1s asked [Ivan-ACC and Peter-ACC]$_i$ each-ms-ACC about other-ms-LOC$_i$
I asked Ivan and Peter about each other

In (22a), the feminine, singular, NOM-DAT form jedna o drugoj becomes jednoj o drugoj, reflecting first element case agreement with the dative verbal NP complement. A similar pattern in (22b) shows case agreement with the Accusative object, Ivana i Petra. In (22b), the masculine, singular, NOM-LOC jedan o drugom(e) changes to jednog o drugom(e), agreeing with the Accusative NP antecedent. As discussed in Section 2.3., case agreement is used by some speakers to disambiguate sentences containing the reciprocal.

A limited number of mutually reflexive (reciprocal) verbs are found in Serbo-Croatian. In these cases, jedan drugoga alternates with the clitic se, but not with sebe. (egs., Bidwell 1965-66:38)

(23) a. Oni se pozdravljaju
they-NOM$_i$ self$_i$ greet-3p
They$_i$ greet one another$_i$

b. Oni pozdravljaju jedan drugoga
they-NOM greet-3p one another-ACC
They$_i$ greet one another$_i$

2.3. Antecedent Selection in Serbo-Croatian Anaphoric Binding

The antecedent properties of Serbo-Croatian reciprocal and reflexive pronouns are discussed in this section. Data indicate the range of eligible antecedents in monoclausal sentences containing a single finite verb varies within the class of anaphors.

2.3.1. Antecedents for the Reflexive Pronoun

Although subject antecedents are preferred, Serbo-Croatian permits subject and object antecedents for the reflexive pronoun sebe in monoclausal sentences.[12] Even under pragmatic pressure favoring a subject antecedent (see eg.(25b)), objects are permitted. However, native speakers exhibit a strong preference for subject antecedents, and object antecedents are only marginally acceptable in some constructions. For example, the object antecedent for the genitive reflexive sebe in sentences such as (26) is marginal to unacceptable. Lexical effects are likely to condition the acceptability of object antecedents in Serbo-Croatian.

(24) Milicioner je ispitivao osumnjičenog o sebi
policeman-N be-3s questioned suspect-A about self-L
The policeman$_i$ questioned the suspect$_j$ about himself$_{i/j}$

(25) a. Doktor je pitao pacijenta o sebi
doctor-N be-3s questioned patient-A about self-L
The doctor$_i$ questioned the patient$_j$ about himself$_{i/j}$

b. Pacijent je pitao doktora o sebi
patient-N be-3s questioned doctor-A about self-L
The patient$_i$ questioned the doctor$_j$ about himself$_{i/j}$

(26) Ivan je poslao Petru odjeću za sebe/njega
Ivan-N be-3s posted Peter-D clothes-A for self/him-G
Ivan$_i$ sent Peter$_j$ clothes for himself$_{i/*?j}$/him$_{*i/j}$

In ditransitive sentences, with the reflexive sebe embedded in a prepositional phrase (PP) within a noun phrase, antecedent selection follows the pattern shown in (27). Speakers who accept both local and non-local antecedents indicate a preference for clausal, rather than NP, subjects. Speakers also prefer to disambiguate sentences using pronouns when possible.

(27) Vera je dala Nini Kristininu knjigu o sebi/njoj
Vera-NOM be-3s gave Nina-DAT [Kristina-GEN book about self/her-LOC]
Vera$_i$ gave Nina$_j$ Kristina's$_k$ book about herself$_{i/*j/k}$/her$_{*i/j/?k}$

2.3.2. Antecedents for the Possessive Reflexive

Eligible antecedents for the reflexive possessive svoj are restricted to clausal subjects in simplex sentences.[13] (eg.(28b), Mihaljević 1990:145)

(28) a. Vlado je dao Ivanu svoj/njegov šešir
Vlado-NOM be-3s gave Ivan-DAT self's/his hat-ACC
Vlado$_i$ gave Ivan$_j$ his own$_{i/*j}$/his$_{*i/j}$ hat

b. Janko daje Marku svoju knjigu
Janko-NOM gives Mark-DAT self's book-ACC
Janko$_i$ is giving Mark$_j$ his own$_{i/*j}$ book

The same coreference pattern occurs when the possessive reflexive modifies an NP complement of a locative PP. As shown in example (29), the reflexive svojoj may only refer to the clausal subject, Ivan. In complementary distribution, the possessive pronoun njen(ACC) shows gender agreement with its NP object antecedent, Nina,[14] as well at agreement with the NP kući.

(29) Ivan je poljubio Ninu u svojoj/njenoj kući
Ivan-NOM be-3s kissed Nina-ACC at self's/her house-LOC
Ivan$_i$ kissed Nina$_j$ at his/her own$_{i/*j}$/her$_{*i/j}$ house

2.3.3. Antecedents for the Reciprocal Pronoun

The reciprocal pronoun jedan drugoga may take either a subject (30a) or an object(30b) antecedent. This pattern is well-established in the Mostar dialect, though some Belgrade speakers only permit object antecedents in constructions with the reciprocal in adjunct position. For these speakers, the reciprocal clitic se is used to refer to the subject.

(30) a. Kristina i Suzana su lagale Petru jedna o drugoj
[Kristina-NOM and Vesna-NOM]$_i$ be-3p lied Peter-DAT one-fs-NOM about other-fs-LOC$_i$
Kristina and Susan lied to Peter about each other

b. Petar je lagao Kristini i Suzani jednoj o drugoj
Peter-NOM be-3s lied [Kristina-DAT and Vesna-DAT]$_i$ to-one-fs-DAT about other-fs-LOC$_i$
Peter lied to Kristina and Vesna about each other

c. Petar i Kristina su predstavili Ivana i Ninu jedni drugima
[Peter-N and Kristina-N]$_i$ be-3p introduced [Ivan-A and Nina-A]$_j$ to-each-np-NOM other-np-DAT$_{i\&j}$
Peter and Kristina introduced Ivan and Nina to each other

Antecedents may be disambiguated with case agreement, as shown in example (31). In (31c), the reading that includes both subject and object is strongly preferred, while in (31d) the permitted readings are equally acceptable. Most speakers produce only (31c) and assign an inclusive subject and object reading.

(31) a. Lovci su obavijestili ribare **jedan o drugome**
hunters-NOM$_i$ be-3s informed fishermen-ACC$_j$
each-ms-NOM about other-ms-LOC$_{i/*j}$
The hunters informed the fishermen about each other

b. Lovci su obavijestili ribare **jednog o drugome**
hunters-NOM$_i$ be-3s informed fishermen-ACC$_j$
each-ms-ACC about other-ms-LOC$_{*i/j}$

c. Lovci su obavijestili ribare **jedni o drugima**
hunters-NOM$_i$ be-3s informed fishermen-ACC$_j$
each-mp-NOM about other-mp-LOC$_{i/*j/i\&j}$

d. Lovci su obavijestili ribare **jedne o drugima**
hunters-NOM$_i$ be-3s informed fishermen-ACC$_j$
each-mp-ACC about other-mp-LOC$_{*i/j/i\&j}$

In summary, antecedent selection for Serbo-Croatian reflexive pronoun sebe is generally subject-oriented, though object antecedents are at least marginally accepted in most monoclausal environments. Speakers who permit object antecedents indicate a distinct preference for subject referents. Antecedent choice for the reflexive possessive pronoun svoj is more restricted. The reflexive possessive can only corefer with subject antecedents. The reciprocal pronoun differs in this respect. For most speakers, the reciprocal may refer to subject and/or object antecedents.

2.4. Domain of Anaphoric Binding in Serbo-Croatian

It has become increasingly evident that the properties of anaphoric binding in English are not typical of the world's languages. In particular, non-subject antecedents for reflexives are somewhat uncommon cross-linguistically, and the canonical governing category, which adequately characterizes the English binding domain, does not accurately describe the coreference properties of reflexives in many other languages. To correctly describe the full range of binding facts, a distinction is made between cases in which an anaphor must have an antecedent in its governing category (local binding) and cases in which the antecedent may occur outside the governing category of the anaphor (long-distance binding). In this section, the locality domain of Serbo-Croatian binding will be discussed in some detail.

2.4.1. Finite Complement Clauses

When a Serbo-Croatian anaphor is the NP complement of a finite verb, the anaphor must be bound to an antecedent found in the same minimal finite clause. (In the following examples, the canonical governing category for the anaphor is indicated by angle brackets, and square brackets mark other relevant categories.)[15]

(32) a. Petar zna da <Ivan gleda **sebe** u ogledalu>
Peter-N know-3s that <Ivan-N look-3s self-A in mirror-L>
Peter$_i$ knows that Ivan$_j$ is looking at himself$_{*i/j}$ in the mirror

b. Roditelji su mislili da <djeca vole **jedan drugoga**>
parents-N be-3p thought that <children-N love-3p each-N other-A>
The parents$_i$ thought that the children$_j$ love each other$_{*i/j}$

A reflexive possessive modifying an NP complement of a finite verb behaves in the same way:

(33) Petar zna da <Ivan voli **svoju** sestru>
Peter-N know-3s [that<Ivan-N love-3s self's sister-A>]
Peter$_i$ knows that Ivan$_j$ loves his own$_{*i/j}$ sister

The binding properties of anaphors in finite complement clauses with pro subjects pattern like anaphors in finite clauses with lexical subjects. The pro subject in the embedded clause is coindexed with either the matrix object(34) or subject(35):

(34) a. Saša je prisilio Ivana [da <sluša **sebe**>]
Sasha$_i$-N be-3s told Ivan$_j$-A [that <pro$_j$ listen-3s to self$_{*i/j}$-A>]
Sasha$_i$ told Ivan$_j$ to listen to himself$_{*i/j}$

b. Mi smo ih zamolili [da <sipaju čaj **jedan drugome**]>
we$_i$-N be3-s them$_j$-A asked [that <pro$_j$ pour-3p tea-A each-N other$_{*i/j}$-D>]
We$_i$ asked them$_j$ to pour each other$_{*i/j}$ tea

c. Profesor je zamolio svoga asistenta [da <čita [**svoj** izvještaj]>]
professor$_i$-N be-3s asked his assistant$_j$-A [that <pro$_j$ read-3s [self's$_{*i/j}$ report-A]>]
The professor$_i$ asked his assistant$_j$ to read his own$_{*i/j}$ report

(35) Petar je obećao Ivanu [da <će obrijati [**svoju** bradu]>]
Peter$_i$-N be-3s promised Ivan$_j$-D [that <pro$_i$ will-3s shave self's$_{i/*j}$ beard-A>]
Peter$_i$ promised Ivan$_j$ to shave his own$_{i/*j}$ beard

These cases, both with overt and null subjects, are consistent with standard Binding Theory. In examples (34) and (35), the null subject (pro) is coindexed with a matrix NP; the embedded verb shows agreement with the null subject. AGR is therefore present in the embedded clause and governs the pro subject of the CFC. The reflexive is governed by the verb (32, 34a,b) or by the head noun (33, 34c, 35). Lexical and pro antecedents c-command the anaphors in examples (32-35). All antecedents are local; long-distance antecedents for reflexives occurring in finite complement clauses are ungrammatical in Serbo-Croatian. The governing category for Serbo-Croatian reciprocal and reflexive pronouns in these complement clauses is the minimal CFC, the finite embedded clause.

2.4.2. Infinitival Complement Clauses

Infinitival complement clauses with subject control verbs are fully acceptable in the Western variant found in Croatia(36a), but are avoided in favor of a finite complement construction in the Eastern variant spoken in Bosnia-Hercegovina and Serbia(36b), (examples based on Craig 1975:149)[16]

(36) a. Želim ići
(I)$_i$ want-1s [PRO$_i$ to-go]
I want to go

b. Želim da idem
(I)$_i$ want-1s [that [pro$_i$ go-1s]]
I want to go

Certain verbs including željeti (to wish, want), voljeti (to like), and htjeti (to want) cannot take the da construction in Croatian dialects (Craig 1975:150). Infinitivals with these verbs are marginally acceptable in the Eastern variant, including the Mostar dialect (37b), (example (37a) based on Craig 1975:150; (37b) based on Browne 1993).

(37) a. On hoće <[zaboraviti [svoju nesreću]]>[17]
he$_i$ want-3s [PRO$_i$ to-forget [self$_i$'s misfortune]]
He wants to forget his own misfortune

b. Nina želi <[kupiti [sliku sebe]]>
Nina$_i$-N want-3s [PRO$_i$ to-buy painting-A self$_i$-G]
Nina wants to buy a painting of herself

c. Slavko i Olga žele <[vidjeti jedno drugo]>
[Slavko and Olga]$_i$-N wish-3p [PRO$_i$ to-see one-N another$_i$-A]
Slavko and Olga wish to see one another

Object control infinitival complements are nearly absent in Serbo-Croatian (Bennett 1991; Progovac 1991a). They do not occur in the Eastern dialects of Bosnia-Hercegovina and Serbia. In Croatia, object control infinitivals are reported only rarely[18], (example (38) based on Craig 1975:154)

(38) Pomagao sam Jasni raditi
helped (I)$_i$-N be-1s Jasna$_j$-D [PRO$_j$ to-work]
I helped Jasna work

Some speakers of Western variants who accept object control infinitival constructions, also permit coreference options (39b) that more closely approximate the binding pattern shown in other Slavic languages (egs.(40,41)):

(39) a. Ivan me je prisilio [da <kritikujem sebe>]
Ivan$_i$-N me$_j$-A be-3s ordered [that <pro$_j$ criticize-1s self$_{*i/j}$-A>]
Ivan$_i$ told me$_j$ to criticize himself$_{*i}$/myself$_j$

b.?Ivan me je prisilio <[kritikovati[19] sebe]>
Ivan$_i$-N me$_j$-A be-3s told <[PRO$_j$ criticize self$_{??i/j}$-A]>
Ivan$_i$ told me$_j$ to criticize himself$_{??i}$/myself$_j$

In Russian, reflexives in infinitival clauses may refer to the embedded PRO subject (and its antecedent) or to the subject of the matrix clause.[20] (egs.(40a), Rozental' 1974, cited in Rappaport 1986:104; (40b), Klenin 1974:30)

(40) a. On ne razrešaet mne <[proizvodit'[opyty nad soboj]]>
he$_i$-N not permit me$_j$-D<[PRO$_j$ to-perform experiments-A on self$_{i/j}$-INSTR]>
He does not allow me to perform experiments on himself/myself

b. Mat' poprosila doč' <[nalit' sebe vody]>
mother$_i$ asked daughter$_j$ <[PRO$_j$ to pour self$_{i/j}$ some water]>
The mother$_i$ asked the daughter$_j$ to pour herself$_{i/j}$ some water

Polish (Reinders-Machowska 1991:141) shows the same coreference pattern with object control verbs:

(41) Jan kazał Piotrowi zbudować dom dla siebie
Jan$_i$ ordered Peter$_j$ [PRO$_j$ to-build house for self$_{i/j}$]
Jan ordered Peter to build a house for himself

The binding pattern in object control sentences in Russian and Polish (and rarely in Serbo-Croatian) presents a problem for standard Binding Theory since the canonical governing category is the embedded infinitival clause and potential antecedents occur outside this domain. The infinitival clause contains a subject (PRO) which is controlled by the object of the matrix verb. The predicted antecedent is therefore PRO and its controller. While in each example

(39b,40,41), the local (PRO) antecedent is acceptable, long-distance binding to the matrix subject is also permitted. For speakers of Western variants of Serbo-Croatian, including the Mostar dialect, long-distance binding in object control sentences is not instantiated.

2.4.3. Anaphors in Noun Phrases

Both Eastern and Western variants of Serbo-Croatian permit long-distance binding of reflexive pronouns contained in NP complements. The canonical governing category is the NP, assuming it has a lexical subject, which is defined as an NP in NP Specifier position ([NP,NP]). Serbo-Croatian permits antecedents to occur in the finite clause containing the complex NP.[21] Clausal subject preference is reported for (42a) and (42b). Many speakers equally permit local and long-distance binding in (42c,d,e), while others show some preference for either clausal or NP subject antecedent in these sentences.[22]

(42) a. Ivan je čuo <[moje mišljenje o sebi>]
Ivan-N be-3s heard <[my opinions-A about self-L>]
Ivan$_i$ heard my$_j$ opinions about himself$_i$/myself$_j$

b. Ivan je bio svestan <[mišljenja njegovih prijatelja o sebi]>
Ivan-N be-3s was conscious <[opinion-A his-G friends about self-L]>
Ivan$_i$ was conscious of his friends'$_j$ opinion of himself$_i$/themselves$_j$

c. Ivan je čuo <[Vesnin opis sebe]>
Ivan-N be-3s heard <[Vesna-G description-A self-G]>
Ivan$_i$ heard Vesna$_j$'s description of himself$_i$/herself$_j$

d. Saša kaže [da Petar čita <[Ivanovo pismo o sebi]>]
Sasha-N say-3s [that Peter-N read-3s <[Ivan-G letter-A about self-L]>]
Sasha$_i$ says that Peter$_j$ is reading Ivan$_k$'s letter about himself$_{*i/j/k}$

e. Nina želi [da čita <[Kristininu knjigu o sebi]>]
Nina$_i$-N want-3s [that pro$_i$ read-3s <[Kristina-G book-A about self$_{i/j}$-L]>]
Nina$_i$ wants to read Kristina$_j$'s book about herself$_{i/j}$

The following judgements indicate that antecedent selection is sensitive to a secondary reference condition involving person. Alternation of full NP/pronoun antecedents apparently influences antecedent choice for Mostar speakers who have this distinction. In the examples below, only (43c) shows preference for the local antecedent.

(43) a. Ja sam čitao <[njegov članak o sebi]>
I-N be-1s read <[his-G article-A about self-L]>
I$_i$ read his$_j$ article about myself$_i$/himself$_{(?)j}$

b. Petar je čitao <[Ivanov članak o sebi]>
Peter-N be-3s read <[Ivan-G article-A about self-L]>
Peter$_i$ read Ivan$_j$'s article about himself$_{i/(?)j}$

c. Ja sam čitao <[Ivanov članak o sebi]>
I-N be-1s read <[Ivan-G article-A about self-L]>
I$_i$ read Ivan$_j$'s article about myself$_{(?)i}$/himself$_j$

This pattern is not due to blocking effects produced by person mismatch between intervening potential antecedents. The reflexive in the following context (44) may refer to either the subject of the clause or the subject of the NP, despite person feature difference. Clausal subjects are preferred in this context by most Mostar dialect speakers, as in (43a).

(44) Oni vole <[moje pesme o sebi]>
they-N like <[my-G songs about self-L]>
They$_i$ like my$_j$ songs about themselves$_i$/myself$_j$

Speakers indicate a preference for long-distance binding of reflexive possessives that occur in PPs within embedded CFC nominals (45a). Again, for some speakers, this binding pattern is somewhat sensitive to secondary reference conditions involving full NP/pronoun alternations. Local binding is more acceptable when the clausal subject is a 1st person pronoun and the subject of the complex nominal is a full NP (45b).

(45) a. Ja sam čitao <[njegov članak [o **svojem** radu]]>
I-N be-1s read <[his-G article-A [about self's work-L]]>
I_i read his_j article about my_i/his $own_{(?)j}$ work

b. Ja sam čitao <[Ivanov članak [o **svojem** radu]]>
I-N be-1s read <[Ivan-G report-A [about self's work-L]]>
I_i read $Ivan_j$'s report about my_i/his own_j work

In contrast to the reflexive pronouns, the reciprocal pronoun is bound in its governing category (46a). For comparison, the standard local/long-distance coreference pattern for the reflexive pronoun is shown in a similar context in (46b).

(46) a.*Oni su čitali <[moje žalbe **jedan protiv drugoga**]>
they-N be-3p read <[my complaints-A each-N against other-G]>
$They_i$ read my complaints against each $other_{*i}$

b. Oni su čitali <[moje žalbe protiv **sebe**]>
they-N be-3p read <[my complaints-A against self-G]>
$They_i$ read my_j complaints against $themselves_i$/$myself_{?j}$

In (47a), the embedded nominal lacks a lexical subject. Therefore, the governing category for the reciprocal is the matrix clause. The Genitive NP Tolstoja functions as subject of the NP in (47b). In this case, the NP is the governing

category, and binding outside the complex NP is ungrammatical. This, again, is in contrast to antecedent options for the reflexive pronoun which may be bound outside the canonical governing category.

(47) a. <Pisci su čitali [reminiscencije jedni o drugima]>
<writers-N be-3p read [reminiscences-A one-np-N about other-p-L]>
The writers$_i$ read reminiscences about each other$_i$

b.*Pisci su čitali<[reminiscencije od Tolstoja jedni o drugima]>
writers-N be-3s read <[reminiscences-A of Tolstoy-G each about other-p-L]>
The writers$_i$ read Tolstoy's reminiscences about each other$_{*i}$

c. Pisci su čitali<[reminiscencije od Tolstoja o sebi]>
writers-N be-3s read <[reminiscences of Tolstoy-G about self-LOC]>
The writers$_i$ read Tolstoy$_j$'s reminiscences about themselves$_i$/himself$_j$

The locality domain for binding of Serbo-Croatian anaphora may be summarized in the following way:

(48) a. The locality domain of the Serbo-Croatian reflexive pronoun (sebe) and the reflexive possessive pronoun (svoj) is the minimal finite clause.

b. The locality domain of the Serbo-Croatian reciprocal pronoun (jedan drugoga) is the minimal CFC, the canonical governing category.

2.4.4. Binding Properties of Subject Internal Reflexives

Subject internal reflexives are bound within the minimal CFC, the embedded complex NP subject. Structural (i.e. c-command) restrictions on syntactic antecedents of reflexives restrict antecedents to the complex NP in these constructions.[23] This restriction accounts for the local

binding pattern in (49c). As with reflexives occurring in object position in finite complement clauses, antecedents for reflexives in clausal subjects cannot occur outside the embedded finite clause (49).

(49) a. Kristina misli da je [Verino mišljenje o sebi] pogrešno
Kristina-N think-3s [that be-3s [Vera-G opinion of self-L]-N wrong]
Kristina$_i$ thinks that Vera$_j$'s opinion of herself$_{*i/j}$ is wrong

b. Saša misli da će [Ivanov film o sebi] osvojiti nagradu
Sasha think-3s [that will [Ivan-G film about self-L]-N to-win prize-A]
Sasha$_i$ thinks that Ivan$_j$'s film about himself$_{*i/j}$ will win a prize

c. Kristina zna da [Verina knjiga o sebi] muči Ninu
Kristina-N know-3s that [[Vera-G book about self-L] troubles Ninu]
Kristina$_i$ knows that Vera$_j$'s book about herself$_{*i/j/*k}$ troubles Nina$_k$

Lack of "*i*-within-*i*" effect

As shown in the following examples (50), when an antecedent for a subject internal reflexive pronoun is not present in the minimal CFC, the lower clause, the resulting sentence is ungrammatical.

(50) a. Ivan zna da je [članak o *sebi/njemu] izašao u novinama
Ivan-N know-3s [that be-3s [article about self/him-L] appeared in newspaper-L]
Ivan$_i$ knows that an article about himself$_{*i}$/him$_i$ appeared in the newspaper

b. Nina je rekla Veri da je [nova knjiga o *sebi/njoj] pravi uspjeh
Nina-N be-3s told Vera-DAT [that be-3s [new book about self/her-LOC] real success]
Nina$_i$ told Vera$_j$ that a new book about herself$_{*i/*j}$/her$_{i/j}$ was a real success

The examples in (49) are grammatical with sebi since the reflexive is bound within its governing category, the CFC complex NP subject of the embedded finite clause. In example (50), there is no eligible antecedent in the embedded clause; therefore, sebi cannot be bound within the minimal governing category, and a Condition A violation occurs. The same pattern occurs with the possessive reflexive (51).

(51) Ivan zna da je [članak o *svojem/njegovom radu] izašao u novinama
Ivan-N know-3s [that be-3s [article about self's/his-G work] appeared in newspaper-L]
Ivan$_i$ knows that an article about his own$_{*i}$/his$_i$ work appeared in the newspaper

This pattern is not consistent with a version of the Binding Theory (Chomsky 1981) that places accessibility requirements on the SUBJECT of a governing category. standard Binding Theory requires that coindexation of c-commanding subjects and anaphors not violate the "i-within-i" condition: *[$_i$...α_i...] (Chomsky 1986a:174). That is, an antecedent cannot be coindexed with any category properly containing the anaphor α, ruling out cases like *[$_i$ his$_i$ friend]. English permits reflexives occurring in nominal subjects to refer outside the finite embedded clause, since the reflexive cannot be coindexed with the clausal subject without violating the i-within-i condition. This is designed to capture the following contrast:

(52) a. The men$_i$ think [that [the journalists'$_j$ pictures of **themselves**$_{*i/j}$] are on sale]

b. The men$_i$ think [that [pictures of **themselves**$_i$] are on sale]

In the first example (52a), the anaphor is bound in the minimal governing category, the CFC nominal subject of the embedded finite clause. The nearest "accessible" subject for the anaphor in (52b) is in the matrix clause; AGR is not accessible as a subject in the embedded clause because AGR is coindexed with the NP subject which contains the anaphor. Coreference is blocked by the i-within-i condition. Following this line of argument, the minimal governing category in (52b) is the matrix sentence.

The Serbo-Croatian data is not consistent with this analysis.[24] The i-within-i effect does not appear to operate in Serbo-Croatian. In examples (50) and (51), the the embedded finite clause is the minimal governing category. The CFC has a subject, the NP containing the anaphor, and a governor for the reflexive, the preposition o in (50) and the head noun radu in (51). In these cases, AGR is apparently coindexed with the anaphor contained in the nominal subject of the embedded clause. The i-within-i condition does not inhibit AGR-anaphor coindexation, so the lower clause functions as the governing category blocking coreference between the anaphor and an antecedent outside the governing category.

The lack of i-within-i effect occurs in other Slavic languages. Rappaport (1986:112) noted this Slavic coreference pattern in Russian (53a) and Reinders-Machowska (1991:145) reports the same pattern in Polish (53b):

(53) a.*Vanja znaet čto [stat'ja o sebe/svoej žene] pojavilas' v gazete
Vanja-N knows [that [article-N about himself-L/ self's wife-L] appeared in newspaper-L]
Vanja$_i$ knows that an article about himself$_{*i}$/ his own$_{*i}$ wife appeared in the newspaper

b.*Jan wie, że [artikuł o sobie]...
Jan-NOM knows [that [article-NOM about self]...]
Jan$_i$ knows that an article about himself$_{*i}$...

2.5. Standard Binding Theory and Binding in Serbo-Croatian

To summarize the discussion of locality conditions on anaphoric binding in Serbo-Croatian, evidence indicates the reflexive pronoun sebe and reflexive possessive pronoun svoj must be bound within the minimal finite clause which contains them.[25] By contrast, the reciprocal pronoun jedan drugoga must be bound in the minimal CFC, an NP with a lexical subject or a finite clause.

Standard Binding Theory fails to account for the binding pattern in Serbo-Croatian, which like other Slavic languages, permits long-distance binding of reflexives occurring in complex NPs. These nominals satisfy the standard definitions of governing category (Chomsky 1981, 1986a), and yet antecedents occur both within the complex NP (to the Specifier subject of the NP) or to a c-commanding antecedent in the minimal finite clause, which is invariably a clausal subject. This pattern is shown in the following Serbo-Croatian example:

(54) Vera je dala Nini Kristininu knjigu o sebi
Vera be-3s given Nina [Kristina's book about self]
Vera$_i$ gave Nina$_j$ Kristina$_k$'s book about herself$_{i/*j/k}$

The status of the IP as a governing category in Serbo-Croatian is unknown, since long-distance effects can only be ascertained with an object control verb in the matrix clause. It is clear that standard theory cannot account for the binding facts of Slavic languages showing the coreference pattern illustrated here.

NOTES

1. The Binding Theory (Chomsky 1981:6) also establishes coreference relations involving null nominals (i.e. PRO, pro, and NP trace), and variables (i.e. wh-trace). The subject of this thesis is the acquisition of lexically overt reflexive anaphors. Discussion of null nominal elements is therefore omitted.

2. A distinction between bind and locally bind is relevant to consideration of long-distance antecedents (Chomsky 1986a:164-5):

(i) α *binds* β if α c-commands and is co-indexed with β.

(ii) α *locally binds* β if α binds β and there is no γ such that α binds γ and γ binds β.

3. The notion of CFC reflects the idea of Huang (1983:557), who proposed that the SUBJECT is relevant to anaphors, but not pronouns. That is, the domain for an anaphor must contain a potential binder (i.e. SUBJECT), whereas for the pronoun the domain is complete without a binder.

4. Complex NPs refer to NPs with lexical subjects. Complex (or possessive) NPs in this thesis do not include CPNPs with sentential complements.

5. Browne (1993) suggests that despite lack of morphology, these features are present since they occur on the (emphatic) modifier sam: (egs. from Browne 1993)

(i) Slavko govori o sebi
Slavko talks about self
Slavko talks about himself

(ii) Mi govorimo o sebi
We talk about self
We talk about ourselves

(iii) Slavko govori o sebi samom
Slavko talks about self alone-s-masc-LOC
Slavko talks about himself alone

(iv) Mi govorimo o sebi samima
We talk about self alone-p-fem or masc-LOC
We talk about ourselves alone

6. Glosses include the following set of abbreviations for case marked lexical items:
NOM/N = Nominative
ACC/A = Accusative
DAT/D = Dative

GEN/G = Genitive
LOC/L = Locative
INSTR = Instrumental

Person and number features are noted by a number (1,2,3) indicating the person feature followed by the number feature (s=singular, p=plural). Gender is indicated as follows:

fem/f = feminine
masc/m = masculine
neut/n = neuter

7. The Dative form si occurs in some dialects of standard Croatian (Browne 1993).

8. Serbo-Croatian is a pro-drop language.

9. The Modern English reflexive paradigm lacks genitive forms found in Old English (Harbart 1986:146):

(i) and him Hrōðgar gewat in [hofe sīnum]
and him(self) Hrothgar$_i$ betook to [house self's$_i$]
And Hrothgar betook himself to his own house
(Beowulf 1236)

10. Citations are in the jekavski variant of Serbo-Croatian. The ekavski form in eg.(16) is svom. The most distinctive feature of jekavski is phonological: epenthesis of (i)j in certain environments: d(ij)ete (child), l(j)eto (summer).

11. The structure of the Serbo-Croatian reciprocal is not obvious. The independence of the case and gender/number feature marking for each component suggests a structure more like a small clause than a single NP. For example, case marking typically mimics the argument structure of the verb, so for a transitive verb, the first element is usually Nominative and the second Accusative. I would like to thank Ljiljana Progovac for this clarification.

12. This contrasts with the Russian pattern cited by Rappaport (1986:101). In a context identical to example (20), Russian speakers only accept subject antecedents.

(i) Milicioner rassprašival arestovannogo o **sebe**
policeman-NOM questioned suspect-ACC about self-LOC
The policeman$_i$ questioned the suspect$_j$ about himself$_{i/*j}$

Klenin (1974) reports the same subject-oriented antecedent pattern in local contexts in Russian. In the following example (Klenin 1974:26), the reflexive is contained in a complex NP:

(i) Vitja rasskazal Saše anekdot o sebe
Vite told Saša story about self
Vite$_i$ told Saša$_j$ a story about himself$_{i/*j}$

In limited cases, object antecedents are accepted by some Russian speakers. However, this coreference pattern only occurs with a restricted class of verbs (Peškovskij 1956:164):

(i) Obščestvo zaščiščaet čeloveka ot samogo sebja
society protects man from alone self
Society$_i$ protects man$_j$ from itself$_i$/himself$_j$

Comrie (1980:106) also claims that coreference between the reflexive pronoun and an object antecedent is a marginal phenomenon in Russian.

13. In Russian, the possessive reflexive svoj can take either subject or object antecedents in some contexts. Peškovskij (1956:164) offers the following example:

(i) On zastal menja v svoej komnate
He found me in self's room
He$_i$ found me$_j$ in his$_i$/my$_j$ own room

14. Possessive pronouns include the following: moj (my), toj (your-singular), njegov (his), njen (or njeszin) (her), naš (our), vaš (your-plural), njihov (their). These pronouns are fully inflected for person, gender, number, and case and show gender and person agreement with the referent (Hawkesworth 1986:145).

15. Coreference is indicated by a subscript device with the following notations:

* unacceptable
? marginal
(?) disfavored
acceptable

16. Craig (1975:149) also notes that in addition to East-West geographical variation in the use of infinitival complements, there is variation between colloquial and standard (or literary) forms within the Western variant. Among (štokavski jekavski) speakers from Zagreb, she found the finite construction preferred in colloquial use:

(i) Nastojim naći stan (standard)
(I) try-1s to-find apartment
I am trying to find an apartment

(ii) Nastojim da nadjem stan (colloquial)
(I) try-1s that find-1s apartment
I am trying to find an apartment

17. The Eastern variant favors the use of željeti in the matrix clause in this construction.

18. According to Wayles Browne (1992:personal communication) object control infinitivals occur with verbs of perception. However, Craig (1975:155) claims use of the infinitival construction with verbs of this class is a "more literary form".

19. The preferred infinitival form for the Serbo-Croatian dialect of Zagreb (Croatia) in this context is kritizirati:

(i) Prisilili su me kritizirati sebe
(they) told be-3p me-ACC to-criticize self-ACC
They$_i$ told me$_j$ to criticize themselves$_{??i}$/myself$_j$

20. The occurrence of reflexives with matrix subject antecedents in object control infinitivals in Russian was first noted by Peškovskij (1914/1956:163) and also pointed out by Ross (1967:177) and Růžička (1973:454).

Timberlake (1979) claims that this coreference pattern may be lexically conditioned and that use of the reflexive in object control sentences is determined in part by the class of the matrix verb.

21. This pattern of long-distance binding also occurs in other Slavic languages. The following examples from Czech ((i), Toman 1991:159), Polish ((ii), Reinders-Machowska 1991:146), and Russian ((iii), Rappaport 1986:106) show that reflexive pronouns in other Slavic languages are not bound in the canonical governing category, the CFC nominal.

(i) Jana zahodila <[Karlovy básně o sobě]>
Jana threw-away <[Karl's poems about self]>
Jana$_i$ threw away Karl$_j$'s poems about herself$_i$/himself$_j$

(ii) Piotr czytał <[Janka artykuł o sobie]>
Peter read <[Janek's article about self]>
Peter$_i$ read Janek$_j$'s article about himself$_{i/j}$

(iii) Ja čital <[ego stat'ju o sebe]>
I read <[his article about self]>
I$_i$ read his$_j$ article about myself$_i$/himself$_j$

22. A similar pattern occurs in Russian in sentences with reflexives occurring in complex NPs: (Klenin 1974:139,fn.3)

(i) My slyšali rasskaz oxotnika o **sebe**
We$_i$ listened to the hunter's$_j$ story about ourselves$_i$/ himself$_j$

23. This accounts for the 100% rejection rate by Mostar informants (n=12) on the following sentence:

(i) *Ivanova knjiga diskredituje **sebe**
[Ivan-G book]-N discredit-3s self
Ivan$_i$'s book discredits himself$_{*i}$

24. Sentences with arbitrary, rather than bound, reading ("stories about oneself") have been excluded from this data set:

(i) Milan smatra da su priče o **sebi** najzanimljivije
Milan-N think-3s that be-3p stories-N about self-L most-interesting
Milan thinks that stories about oneself are most interesting

25. In all cases, this is an indicative finite clause since the subjunctive mood, which permits long-distance binding in Icelandic (Thráinsson 1976), though not in more closely related Russian (Rappaport 1986), does not occur in Serbo-Croatian. However, recent work by Progovac (1993a:fn.1) suggests some "subjunctive-like" complements are present in Serbo-Croatian, though they lack distinctive morphology.

Chapter 3

ALTERNATIVES TO STANDARD BINDING THEORY

3.0. Introduction

Long-distance binding of reflexive anaphors occurs in many, if not most, natural languages. In languages that permit long-distance binding, reflexives may be referentially dependent on antecedents that occur outside the minimal governing category. Such cases are problematic for standard Binding Theory.

Any account of binding that attempts to incorporate this cross-linguistic variation must cope with problems of "domain" and "orientation". That is, identification of potential antecedents for anaphors must involve specification of the syntactic domain in which an antecedent may occur and identification of the grammatical functions of eligible antecedents. In this chapter, three alternative BT analyses which have been applied to acquisition research will be discussed: (1) a parameter model of language-specific domain and antecedent properties of anaphors (Wexler and Manzini 1987), (2) an account that involves movement of anaphors at Logical Form (LF) (Pica 1987, and others), and (3) the Relativized SUBJECT approach that requires X-bar compatibility between SUBJECTs and anaphors in defining relevant binding domain (Progovac 1992).

The parameterized model is discussed in Section 3.1. In Section 3.2, the role of morphological status of anaphors in binding is introduced. LF movement approaches are discussed in Section 3.3 and a Movement-to-INFL analysis is applied to the Serbo-Croatian data. Problems associated with LF movement accounts are described in Section 3.3.3. In Section 3.4, the Relativized SUBJECT approach is introduced and its applicability examined. Comparing these two approaches, significant problems in accounting for the Serbo-Croatian data were encountered in the LF movement analysis, while the Relativized SUBJECT approach yielded a full account of the data from Serbo-Croatian and related Slavic languages.

3.1. UG Parameters in Binding Theory

In order to account for cross-linguistic differences in locality domain and antecedent choice in anaphoric binding, Wexler and Manzini (1987; Manzini and Wexler 1987) proposed two parameters: (1) the Governing Category Parameter (GCP) and (2) the Proper Antecedent Parameter (PAP). These independent parameters of Universal Grammar together determine the domain and grammatical function of antecedents for lexical anaphors in various languages.

3.1.1. Governing Category Parameter

Noting a correlation between inflectional properties of sentences and binding domains for anaphors and pronominals,

Manzini and Wexler (1987:419) introduced a parameterized definition of the governing category:

(1) Governing Category Parameter

γ is a governing category for α iff
γ is the minimal category that contains α and
a governor for α and and has
a. a subject; or
b. an Infl; or
c. a Tense; or
d. a "referential" Tense; or
e. a "root" Tense.

Each parameter setting identifies the defining property of the syntactic domain that represents the governing category in a certain language. "Subject" includes clausal and NP subjects ([NP,IP] and [NP,NP]). "Infl" refers to the presence of this element in finite and infinitival clauses. "Tense" refers to both indicative and subjunctive tenses. "Referential" refers to indicative tense; thus finite clauses. "Root" Tense occurs in the matrix sentence. The five values of the GCP are in set-theoretical relation of proper inclusion, so that a language with an (e) "root" Tense parameter setting permits all smaller domains as well. English is an example of a language that falls into Subset (a), the most restrictive parameter value. Languages that conform to the other parameter settings include:
(b) Italian, (c) Russian, (d) Icelandic, and (e) Korean.

The following contrast between Korean and English illustrates the operation of these two parameter settings: (eg.(2a), Yang 1983:183)[1]

(2) a. John-in [Bill-i [Mary-ka [Tom-iy caki-e tæhan thæto]-lil silhəha-n-ta-ko] sængkakha-n-ta-ko] mit-nin-ta
John$_i$-TOP [Bill$_j$-NOM [Mary$_k$-NOM [Tom$_l$'s self$_{i/j/k/l}$ toward attitude]-ACC hate-ASP-DEC-COMP] think-ASP-DEC-COMP] believe-ASP-DEC
John$_i$ believes that Bill$_j$ thinks that Mary$_k$ hates Tom$_l$'s attitude toward himself/herself$_{i/j/k/l}$

b. John$_i$ believes [that [Bill$_j$ thinks [that [Peter$_k$ hates [Tom$_l$'s attitude toward himself$_{*i/*j/*k/l}$]]]]]

The English reflexive must be bound in the minimal domain containing a governor for the anaphor (toward) and a subject (Tom's); in other words, in the complex NP. The Korean reflexive may take an antecedent in the complex NP, in the immediate clause, in the next higher clause, or in the matrix sentence.

The full range of domain types that are possible are displayed in the following English sentence offered by Finer and Broselow (1986):

(3) Keith$_i$ said that Ronnie$_j$ requires that Bill$_k$ persuade Charlie$_l$ to consider Mick$_m$ fond of himself.

Parameter Value	Possible Antecedent(s)
a. (English)	Mick
b. (Italian)	Mick, Charlie
c. (Russian)	Mick, Charlie, Bill
d. (Icelandic)	Mick, Charlie, Bill, Ronnie
e. (Korean)	Mick, Charlie, Bill, Ronnie, Keith

3.1.2. Proper Antecedent Parameter

According to Manzini and Wexler (1987:431), the fact that languages differ in the choice of proper antecedent for anaphors is also due to the operation of a UG parameter.

(4) Proper Antecedent Parameter

A proper antecedent for α is
a. a subject ß; or
b. any element ß.

In Japanese and Korean, antecedents for reflexives must be subjects, while in English, objects can also function as antecedents. Consistent with the (a) (subject only) parameter setting, potential object antecedents are ruled out in Japanese. By contrast, the English setting (b) permits both subject and object antecedents.

(eg.(5a), Hirakawa 1989:36)

(5) a. John-ga Bill-ni zibun-no syasin-o mise-ta
John-NOM Bill-DAT self-GEN picture-ACC showed
$John_i$ showed $Bill_j$ a picture of $himself_{i/*j}$

b. $John_i$ showed $Bill_j$ a picture of $himself_{i/j}$

Japanese is a subset of English, since all interpretations allowed by parameter value (a) are also permitted by parameter value (b), but not vice versa.

3.1.3. Lexical Parameterization Hypothesis

Wexler and Manzini (1987:55) also introduced the idea that UG parameters are associated with particular lexical items in a language, rather than with particular languages. They refer to this notion as the Lexical Parameterization Hypothesis. In effect, this hypothesis claims that the GCP settings that define governing categories in various languages actually define binding domains for particular anaphors and pronominals in languages.

3.1.4. Problems with the Parameter Setting Approach

A number of criticisms of this approach have been made in the literature. Safir's (1987) criticism of the parameter setting approach (Manzini and Wexler 1987; Wexler and Manzini 1987) focuses on the issues of potential under-generalization and atomization. Since GCP values are associated with particular lexical items, a lack of generalization occurs. Further, the GCP relates to a single feature of the grammar--the governing category--and GCP values are associated with single inflectional properties of sentences. This contradicts the accepted view of the UG parameter as a mechanism which has wide-ranging effects in the grammar of a particular language. The narrowness of the GCP (and PAP) reduces the parameters to the level of descriptive device.

Hermon (1992) also points out the inadequacy of the parameter setting approach as a means of linking properties associated with binding in languages. She notes that the stipulation of independence of the PAP and GCP fails to capture certain patterns of coreference that connect long-distance binding with subject orientation in antecedent selection.

In addition, the GCP and PAP show other empirical inadequacies. The Wexler and Manzini approach fails to account for blocking effects in languages like Chinese (Battistella 1989; Cole, Hermon and Sung 1990; Huang and

Tang 1989; Tang 1989) which restrict long-distance binding by requiring person feature match between the reflexive and intervening potential antecedents. Because this property cannot be accounted for by the GCP and PAP, Hermon (1992) suggests it would require the postulation of yet another parameter.

These descriptive and explanatory shortcomings limit the usefulness of the Wexler and Manzini model. Although a number of L1 and L2 acquisition studies are set in this framework, research on the Binding Theory has abandoned this analysis in favor of alternative approaches that are independently motivated and offer a unified theory of binding.

3.2. Morphological Status of Anaphors and Binding

Two characteristics of long-distance binding are frequently cited in the literature (cf. Battistella 1987; Cole, Hermon and Sung 1990; Hellan 1988; Huang and Tang 1989; Katada 1991; Pica 1987; Progovac 1991a, 1992; Reuland 1989; Yang 1983):

(6) a. Anaphors that permit long-distance binding require subject antecedents.

b. Only simplex anaphors permit long-distance binding; complex anaphors are always locally bound.

Complex (or phrasal, XP) anaphors include reciprocals such as English each other and Serbo-Croatian jedan drugoga and reflexives composed of an anaphoric or pronominal

morpheme and a morpheme indicating SELF, such as herself in English. The English complex reflexive may be analyzed as $[_{NP}[_{SPEC}him][_{N'}[_{N}self]]]$, a maximal projection X^{max}. Simplex (or head, X^{0}) anaphors, including sebja in Russian and sebe in Serbo-Croatian, consist of a single morpheme SELF and are analyzed as $[_{NP}[_{N}sebe]]$.[2]

The properties of complex reflexives of include:

- morphological complexity
- local binding
- subject and object antecedents

The properties of simplex reflexives include:

- morphological simplicity
- long-distance binding
- subject orientation

The binding possibilities of complex and simplex anaphors thus differ in two dimensions. Complex anaphors are locally bound and may take subject or object antecedents. By contrast, simplex anaphors often exhibit long-distance binding and, in these cases, are subject-oriented.

The contrast between the two clusters of properties is clear in languages that have both types of anaphors. For example, Chinese reflexive constructions may be formed with either the simplex anaphor ziji (self), or the complex anaphor (pronoun)+ziji (Battistella 1987; Huang and Tang 1989; Tang 1989). In monoclausal sentences, these reflexives behave identically, but in biclausal sentences, only ziji can take a long-distance antecedent, as shown in (7).

(egs., Cole, Hermon and Sung 1990:5)

(7) a. Zhangsan hen xihuan ziji/ta ziji
Zhangsan$_i$ very likes self$_i$/himself$_i$
Zhangsan likes himself very much

b. Zhangsan renwei [Lisi zhidao [Wangwu xihuan ziji /ta ziji]]
Zhangsan$_i$ thinks [Lisi$_j$ knows [Wangwu$_k$ like self$_{i/j/k}$ /himself$_{*i/*j/k}$
Zhangsan thinks Lisi knows Wangwu likes himself

Although complex anaphors are locally bound, simplex anaphors exhibit various types of LD binding. In some languages, including Chinese (Battistella 1987, 1989; Huang and Tang 1989; Tang 1989), Japanese (Fukui 1984; Katada 1991), and Korean (Cole, Hermon and Sung 1990; Yang 1983) simplex reflexives may take antecedents outside a finite embedded clause, as in (7b).

In other languages, LD binding is more limited. In Icelandic (cf. Maling 1984; Thráinsson 1976), X° reflexives can corefer with antecedents outside subjunctive and infinitival complement clauses.[3] Mainland Scandinavian languages (Everaert 1986; Hellan 1988; Jakubowicz and Olsen 1988) which lack the subjunctive mood, also permit antecedents outside infinitival clauses. In these languages, the binding domain is the minimal indicative finite clause.

Slavic languages generally exhibit LD binding of X° reflexives outside infinitival complement clauses and complex NPs. For example, LD binding within the minimal finite clause occurs in Russian (Klenin 1974; Rappaport 1986; Růžička 1973) and in Polish (Reinders-Machowska 1991). Russian allows antecedents outside infinitivals ((8a),

Klenin 1974:42) and complex NPs ((8b), Rappaport 1986:106). Polish (Reinders-Machowska 1991:141,146) has the same coreference pattern, as shown in (9).

(8) a. Mat' poprosila doč' nalit' sebe vody
mother$_i$ asked daughter$_j$ [PRO$_j$ to pour self$_{i/j}$ some water]
The mother$_i$ asked the daughter$_j$ to pour herself$_{i/j}$ some water

b. Ja čital ego stat'ju o sebe
I$_i$ read [his$_j$ article about self$_{i/j}$]
I read his article about myself/himself

(9) a. Jan kazał Piotrowi zbudować dom dla siebie
Jan$_i$ ordered Peter$_j$ [PRO$_j$ to-build house for self$_{i/j}$]
Jan ordered Peter to build a house for himself

b. Piotr czytał Janka artykuł o sobie
Peter$_i$ read [Janek's$_j$ article about self$_{i/j}$]
Peter read Janek's article about himself

In (8a) and (9a), the long-distance antecedent is the matrix subject. The object of the matrix verb is coindexed with the PRO subject of the embedded clause, the local antecedent. The sentences with reflexives in complex NPs (8b,9b) are also ambiguous. In each case, the X° reflexive can refer to either the subject of the NP or the subject of the sentence.

In Serbo-Croatian, as we have seen, the X° reflexive may be LD-bound outside a complex NP, but not outside a finite clause, as in (10). Within this domain, a reflexive may take either a local or a long-distance antecedent. That is, the X° reflexive occurring in a complex NP may take as an antecedent either the [NP,NP] subject of the noun phrase or the [NP,IP] clausal subject.

(10) Saša kaže da Petar čita Ivanovo pismo o sebi
Sasha$_i$ says [that Peter$_j$ reads [Ivan$_k$'s letter about self$_{*i/j/k}$]]
Sasha says that Peter is reading Ivan's letter about himself

Although it seems plausible to assume that Serbo-Croatian follows the Russian-Polish pattern of LD binding outside infinitival embedded clauses, it is impossible to know whether or not this occurs since object control verbs are not present in Serbo-Croatian (Bennett 1991; Progovac 1991a).[4]

Head Status of X° Anaphors

Current versions of the Binding Theory, including LF movement accounts (Battistella 1987; Cole, Hermon and Sung 1990; Huang and Tang 1989; Katada 1991; Pica 1987), the Relativized SUBJECT approach (Progovac 1992; Progovac and Franks 1992), and argument structure accounts (Giorgi 1984; Reinhart and Reuland 1991; Reuland 1989), that rely on the distinction between complex and simplex reflexive pronouns make a crucial assumption based on X-bar Theory (Chomsky 1981, 1986a). That is, reciprocals and compound reflexives are XP (or X^{max}) anaphors while simplex reflexives are X° (or head) anaphors.

The status of the Serbo-Croatian reciprocal is not in question. It is an XP anaphor, exhibiting the local binding characteristics of complex anaphors (See Chapter 2, Sections 2.3.3. and 2.4.). The Serbo-Croatian reflexives, sebe and

svoj, are also assumed to be heads because they are not modified by a possessive specifier, such as English her-self or Chinese ta-ziji. With respect to the clitic se, the categorial status of this element is somewhat uncertain. Although Kayne (1987) assumes clitics are heads, Progovac (1993a:fn.4) notes their X-bar status is still subject to debate.

A diagnostic that reveals the constituent structure of X° reflexives involves the acceptability of premodifiers. In the case of Serbo-Croatian, the occurrence of premodifiers with X° reflexives as compared to the ungrammaticality of premodifiers with XP reflexives supports the conclusion that sebe is a head. In principle, lexical material can appear in the Spec position of X° reflexives since it is empty, whereas it is filled in XP reflexives:

(11) XP = $[_{NP}[_{SPEC}$her$][_{N'}[_{N}$self$]]]$

X° = $[_{NP}[_{N}$sebe$]]$

In English, premodifiers cannot appear with XP reflexives:

(12) * usual herself[5]

In Chinese, the X° reflexive ziji may be preceded by a premodifier, though not the XP reflexive taziji. In (13a), ziji is preceded by an adverbial premodifier, and in (13b), a DET + adjective. (egs., Hermon 1992).

(13) a. Wangwu renwei Zhangshan bu xihuan zuotian de ziji/*taziji
Wangwu$_i$ think Zhangshan$_j$ not like yesterday POSS self$_{i/j}$/*he-self
Wangwu thinks that Zhangshan does not like yesterday's self

b. Wangwu renwei Zhangshan bu xihuan nage cuenxixi de ziji/*taziji
Wangwu$_i$ think Zhangshan$_j$ not like that stupid POSS self$_{i/j}$/*he-self

This premodifier pattern also occurs in Russian and Serbo-Croatian, though less freely. Premodifiers are possible with X° reflexive sebja in Russian, but they are not in common use and are stylistically marked. (egs., Michael Yadroff 1993: personal communication)

(14) a.?Ja/on/Vanja uvidel rastrepannogo sebja v zerkale
I/he/Vanja saw undone self in mirror
I/he/Vanja saw my/his undone self in the mirror

b. Ja uvidel sebja v zerkale rastrepannym
I saw self in mirror undone-INSTR
I saw my undone self in the mirror

c. Ja nenavižu/ljublju umnogo sebja
I hate/love smart self
I hate/love my smart self

Example (14a) is marginally acceptable; (14b) would be preferred by native speakers. However, use of the premodifer can occur in ironic or poetic style, as shown in (14c).

A similar situation is found in Serbo-Croatian. Here, again, premodifiers are awkward and stylistically marked. (eg., Ljiljana Progovac 1993: personal communication)

(15) ??Milan je video lepog sebe u ogledalu
Milan be-3s saw handsome self in mirror
Milan saw his handsome self in the mirror

In order to provide a unified account of the domain and antecedent restrictions associated with instantiations of the Binding Theory in various languages, a number of non-parameterized approaches have been proposed. In the following sections, two BT revisions will be considered:

(1) an LF movement-to-INFL approach, and (2) the Relativized SUBJECT approach.

3.3. LF Movement Approaches

LF movement approaches have been proposed by a number of researchers as a means of overcoming the empirical and theoretical inadequacies of standard theory. In particular, these analyses attempt to account for properties of X° and XP anaphors by invoking the idea that all anaphors undergo movement from their S-structure positions at the level of Logical Form in order to fulfill some kind of referential deficiency.

LF movement approaches account for domain and orientation effect by relying on Yang's (1983) insight that X° reflexives may take long-distance antecedents, while XP anaphors take only local antecedents. Subject orientation in LF movement analyses derives from movement of the X° anaphor to INFL which lies outside the c-command domain of potential non-subject antecedents. The binding domain does not vary in LF movement accounts. Domain effects are achieved by varying the distance the anaphor can move up the tree. This approach has the effect of reducing binding relations to government relations since anaphors leave traces which must be governed.

This idea was first proposed by Lebeaux (1983) as a means to account for the distributional differences within

the class of anaphors in English. This analysis, and its development in Chomsky (1986a), did not recognize the X°/XP distinction between anaphors which is central to more recent work. This includes proposals by Pica (1987), Battistella (1987, 1989), Huang and Tang (1989), Cole, Hermon and Sung (1990), and Katada (1991) that have extended LF movement analyses to problems of cross-linguistic variation in anaphoric binding.[6] Pica (1987) introduced the notion that morphological complexity determined the type of movement associated with X°/XP anaphors.

The following discussion will focus on an LF movement account that involves cyclic movement of X° anaphors from INFL-to-INFL (Battistella 1987, 1989; Pica 1987; cf. Huang and Tang 1989). According to Pica (1987), X° anaphors move in order to saturate an open position in their argument structure.[7]

Pica (1987) and others assume all anaphors undergo LF movement and derive domain and subject orientation facts from the movement possibilities afforded anaphors of differing X-bar status. That is, X° anaphors adjoin to heads (V, N, I) and XP anaphors adjoin to maximal projections (VP, PP, IP). X° anaphors raise cyclically through INFL. Since INFL is always the final landing site, X° reflexives cannot be bound by objects due to lack of c-command relation between these elements. X° movement operates according to the Head Movement Constraint (Travis 1984; Baker 1988) and

is subject to standard conditions on movement, including the Empty Category Principle (ECP) which is assumed here to be satisfied by either lexical or antecedent government (Chomsky 1981). Since all movement leaves traces (Chomsky 1981), the Binding Theory applies to the anaphor-trace relation (Chomsky 1986a).[8] In this way, the antecedent-anaphor relation is reduced to a government relation. The consequences of an LF movement analysis for the Serbo-Croatian data will be discussed in the following section.

3.3.1. LF Movement-to-INFL

In large measure, the analysis examined here follows Pica (1987). The general movement constraints assumed in this analysis are consistent with the Barriers framework (Chomsky 1986b), except for the ECP, which is drawn from Chomsky (1981).

The motivation for movement of X° anaphors to INFL at the level of LF crucially involves the notion of saturation (cf. Higginbotham 1985; Huang and Tang 1989; Pica 1987; Reuland 1989). X° anaphors are assumed to be defective heads which must move in the syntax, in the case of clitics, such as Serbo-Croatian se, or at LF, in the case of Serbo-Croatian X° reflexives sebe and svoj.

The motivation for X° movement to INFL rests on the assumption that simplex anaphors lack features and must obtain them by linking to AGR. Although complex XP anaphors

have inherent features allowing direct interpretation, X° anaphors cannot be directly interpreted and thus must adjoin an element with nominal features, the AGR element of INFL.

X° anaphor movement in Serbo-Croatian is limited to the finite clause since the X° is saturated in INFL of the immediate finite clause. In languages permitting infinitival embedded clauses, X° anaphor movement to INFL of a higher clause is motivated by lack of morphological AGR in the lower clause. Subject orientation typical of long-distance X° anaphor movement is a consequence of the c-command relation that holds between INFL and the subject NP. Recalling that Binding Theory holds of the anaphor-trace relation at LF, and the anaphor-antecedent relation is a government relation, the anaphor must be coindexed with an eligible c-commanding antecedent.

This analysis stated here further assumes, following Chomsky (1986a), that XP anaphors, such as Serbo-Croatian jedan drugoga, also move at LF, but that this movement is limited to adjunction to non-argument maximal projections.[9] Both types of movement leave traces.

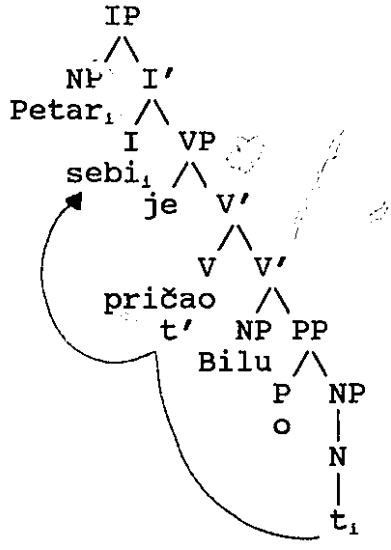
As shown in Section 3.3.2., Movement-to-INFL does not provide a full account of the Serbo-Croatian facts. Further, as discussed in Section 3.3.3., LF movement accounts also present other empirical and conceptual problems which reduce the practical usefulness of this approach in second language acquisition research.

3.3.2. Applying Movement-to-INFL to Serbo-Croatian

Applying this analysis to a monoclausal transitive sentence with a X° anaphor in a PP argument position results in the following structural configuration:

(16) Petar je pričao Bilu o sebi
Peter-NOM be-3s told Bill-DAT about self-LOC
Peter$_i$ told Bill$_j$ about himself$_{i/*j}$

(17)

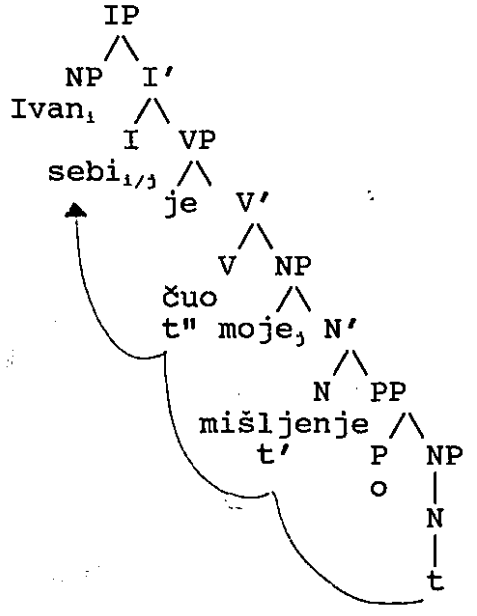


The Binding Theory is not violated by the tree (17) since the anaphor is coindexed with a c-commanding antecedent, and the anaphor-trace relation falls within Principle A domain limitations. Assuming traces left by head movement cannot be deleted at LF, the ECP is also satisfied. The original trace is lexically governed by P; antecedent government of t' is not blocked because LF X° anaphor movement follows V movement (not shown) and thus VP is not a barrier. In this case, movement at LF accounts for the binding pattern.

Consider a case of long-distance X° anaphor movement:

(18) Ivan je čuo [moje mišljenje o sebi]
Ivan-NOM be-3s heard [my opinions-ACC about self-LOC]
Ivan$_i$ heard my$_j$ opinions of himself$_i$/myself$_j$

(19)



In (19), the anaphor sebi is coindexed with a c-commanding antecedent Ivan. As in the Chinese case (7b), antecedents may also be coindexed with intervening X° traces, producing ambiguous or alternative readings.[10] The ECP is also satisfied in (19); the original trace is lexically-governed by P; t to t' movement is well-formed since no barrier intervenes--the NP complement is L-marked by its V θ-governor. Again, following V movement, the VP is no longer a barrier and movement from V to I is permitted.

Movement of an XP anaphor, such as Serbo-Croatian jedan drugoga or English themselves, each other, out of a CFC complex NP is blocked because XPs can only adjoin non-argument XPs.

(20) a.*Oni su čitali [Ivanove žalbe jedan protiv drugoga]
they-N be-3p read [Ivan-G complaints-A each against other-G]
They$_i$ read Ivan's complaints against each other$_{*i}$

b.*The men$_i$ read the cops' reports about each other$_{*i}$ /themselves$_{*i}$

This movement analysis makes correct predictions in general cases, but certain aspects of X° anaphoric movement associated subject internal reflexives are problematic. While the barrierhood of the subject NP correctly blocks movement of the X° anaphor in (21), it is unclear how the X° anaphor can fulfill saturation requirements without movement to INFL.

(21) Kristina misli da je [Verino mišljenje o sebi] pogrešno
Kristina-N think-3s that be-3s [Vera-G opinion-A of self-L] wrong
Kristina$_i$ thinks that Vera's$_j$ opinion of herself$_{*i/j}$ is wrong

In addition, the Serbo-Croatian sentence in example (22) shows the same blocking effect, which in this case results in an ungrammatical sentence.

(22) *Ivan zna da je [članak o sebi] izašao u novinama
Ivan-N know-3s that be-3s [article about self-L] appeared in newspaper
Ivan$_i$ knows that an article about himself$_{*i}$ appeared in the newspaper

If (22) is ungrammatical because X° movement to INFL is blocked, and the anaphor is uninterpretable, then sebi in (21) must be assumed to be interpretable in situ if a c-commanding antecedent is available within the local (CFC) domain.[11]

3.3.3. Problems of the LF Movement Approaches

The positive appeal of the LF movement approach is that it offers a unified account of domain and orientation properties associated with XP and X° anaphors. However, a number of problems associated with the INFL-to-INFL approach have been identified in the literature (see, for discussion Progovac:1993b; Huang and Tang 1989, 1991). Among the empirical deficits of the INFL-to-INFL approach are the problems raised by the Serbo-Croatian X° reflexive sebe when it appears in subject internal position, as discussed in Section 3.3.2.

One of the most difficult problems to be resolved involves lack of movement constraints in construal of LD reflexives. Huang and Tang (1989, 1991) discuss the fact that constraints that govern movement of syntactic constituents, including Subjacency, are not obeyed in long-distance LF movement of reflexives. They note that in Chinese, long-distance antecedents for reflexives may occur across islands, such as adjunct clauses and relative clauses (23a,b), but observe the relative clause island in A-not-A questions involving the same type of LF movement (Huang 1982): (egs. Huang and Tang 1991:271)

(23) a. Zhangsan shuo [rugao Lisi piping ziji], ta jui bu qu
Zhangsan$_i$ say [if Lisi$_j$ criticize self$_{i/j}$], he then not go
Zhangsan$_i$ said that if Lisi$_j$ criticized himself$_{i/j}$, then he won't go

b. Zhangsan bu xihuan [neixie piping ziji de ren]
Zhangsan$_i$ not like [those criticize self$_{i/j}$REL person$_j$
Zhangsan$_i$ does not like those people$_j$ who criticize himself$_i$/themselves$_j$

c.*ni zui xihuan ta mai-bu-mai de shu?
you most like he buy-not-buy REL book
You like the books that he will buy or will not buy?

Huang and Tang (1989) claim that no island violations occur as the result of successive cyclic movement to adjunction sites at LF. Following Fiengo, Huang, Lasnik and Reinhart (1988), they assume that both Subjacency and CED (Huang 1982) apply at LF. However, these constraints are almost wholly vacuous at LF, due to adoption of the "segment theory" of domination (Chomsky 1986b; May 1985) and introduction of a broader range of possible adjunction operations at LF than at S-structure.

Another problem involves restricting successive cyclic movement to the set of anaphors that show long-distance effects. Battistella (1987) claims that successive cyclic movement is limited to INFL-to-INFL movement of X° reflexives. He restricts LD binding to X° reflexives by stipulating no successive cyclic movement for XP reflexives. In principle, cyclic adjunction to XP Specifiers is not ruled out by the theory (Huang and Tang 1989), nor is successive cyclic movement by adjunction to other maximal projections (Progovac 1991a).

Motivation for movement is also unclear. In Pica's (1987) analysis, saturation requirements force movement of X° anaphors to INFL. The binding facts of Scandinavian and

Slavic languages, with morphologically overt AGR, were central to Pica's (1987) discussion. However, this does not account for long-distance binding in languages like Chinese which have morphologically empty AGR. An even more problematic fact for saturation accounts is the existence of local, featureless XP anaphors: Japanese zibun-zisin (Katada 1991), Dutch zichzelf (Everaert 1991), Norwegian seg selv (Hellan 1991), and Icelandic sjálfur sig (Maling 1984, 1986). These XP reflexives do not raise to INFL and thus cannot acquire features from AGR. Progovac (1993b) points out that saturation accounts predict that, contrary to fact, all featureless reflexives show LD binding.

LF movement analyses generally are unable to provide a unified account of the binding facts that hold across languages. As we have seen, the Pica (1987) analysis accounts for binding in languages with long-distance binding outside infinitival and, in some languages, subjunctive clauses, but does not offer an account of long-distance movement that crosses finite indicative clausal boundaries, as in Chinese, Japanese, and Korean. These languages are discussed in the LF movement analysis of Cole, Hermon and Sung (1990), who introduce the notion of lexical/functional INFL to the LF movement model. They stipulate that INFL is lexical in Chinese and functional in English. This binary property of INFL allows long-distance movement outside finite clauses in Chinese, but does not account for

intermediate cases such as Russian and Serbo-Croatian in which long-distance binding occurs within the minimal finite clause.

Progovac (1991a) claims that the INFL landing site required for subject orientation must be stipulated in LF movement accounts by Battistella (1987, 1989), Cole, Hermon and Sung (1990) and Pica (1987), and further notes (1992) that LF movement binding to an LD object by an intermediate trace of a moved reflexive is not ruled out. In fact, X° reflexives can be bound to the [NP,NP] subject of an NP in object position (Progovac 1993a), as shown in the Korean (Yang 1983:183) and Serbo-Croatian examples below.

(24) a. John-in Bill-i Mary-ka Tom-iy caki-e tæhan thæto-lil silhəha-n-ta-ko sæengkakha-n-ta-ko mit-nin-ta
John$_i$-TOP [Bill$_j$-NOM [Mary$_k$-NOM [Tom$_l$'s self$_{i/j/k/l}$ toward attitude]-ACC hate-ASP-DEC-COMP] think-ASP-DEC-COMP] believe-ASP-DEC]
John$_i$ believes that Bill$_j$ thinks that Mary$_k$ hates Tom$_l$'s attitude toward himself/herself$_{i/j/k/l}$

b. Petar čita Ivanovo pismo o sebi
Peter$_i$ reads [Ivan$_j$'s letter about self$_{i/j}$]
Peter$_i$ is reading Ivan$_j$'s letter about himself$_{i/j}$

In these cases, the reflexive has raised to INFL, as evidenced by coreference with clausal subjects, and the ambiguity of such sentences entails binding of the [NP,NP] subject by an intermediate trace of the moved reflexive element.

Another problem involves antecedent government of the traces of LF movement of anaphors. Huang and Tang (1989) state that head-to-head movement of X° anaphors at LF

results in traces subject to antecedent government (Chomsky 1986b). However, this has the effect of ruling out acceptable cases of LD binding in Chinese across adjunct clauses and complex NPs (see egs.(23a,b)). Data of this type force the assumption that traces of X° anaphors are not bound by their antecedents by chain formation.

Blocking effects that occur in some, though not all, languages that exhibit long-distance binding present another challenge to LF movement accounts. Blocking effects that occur in Chinese (Battistella 1989; Huang and Tang 1989; Tang 1989) and Japanese (Katada 1991) prevent coreference between an X° anaphor and the matrix subject antecedent when an intervening clausal subject differs in person and number features. This blocking effect is shown in the following examples from Huang and Tang (1989, 1991:264):

(25) a. Zhangsan shuo [wo zhidao [Lisi chang piping ziji]]
Zhangsan$_i$ say [I$_j$ know [Lisi$_k$ often criticize self$_{*i/*j/k}$]]
Zhangsan$_i$ said that I$_j$ feel that Lisi$_k$ always criticized himself$_{*i/*j/k}$

b. Zhangsan shuo[Wangwu zhidao[Lisi chang piping ziji]]
Zhangsan$_i$ say [Wangwu$_j$ know [Lisi$_k$ often criticize self$_{i/j/k}$]]
Zhangsan$_i$ said Wangwu$_j$ knew that Lisi$_k$ often criticized himself$_{i/j/k}$

As shown in examples (25a,b), the X° reflexive ziji can refer to subject antecedents in superordinate clauses as long as they agree in person and number features, but that coreference is blocked even when the matrix NP agrees with the most local NP .

Tang (1989) attempts to account for this effect by a feature-copying rule which lacks independent motivation in the grammar and appears to be a language-particular rule of Chinese. Battistella (1989) suggests that blocking effects follow from requirement of an INFL landing site for X° anaphors and the operation of an agreement-checking rule that applies to a trace in INFL and the clausal subject. He argues (1989:998) that agreement between the subject and "AGR-like features of the trace of ziji" mirrors subject-AGR coindexing (Chomsky 1986a) that is part of UG. It is not clear how this agreement-checking rule would operate in languages that do not show blocking effects.

Huang and Tang (1989) cite problems in Movement-to-INFL accounts of blocking effects as a basis for their proposal that LF movement of X° anaphors involves IP adjunction rather than head movement.

LF movement approaches reflect recent attempts to reduce Binding Theory to other subtheories of Universal Grammar. By subsuming it under Government Theory and general movement constraints that are based on general principles of core grammar, LF movement approaches are able to maintain the binding principles as universals. Although this aim is positive, the failure of any particular LF movement analysis (cf. Cole, Hermon and Sung 1990, Katada 1991, Pica 1987) to account for more than a small range of the actual cross-linguistic variation in binding properties may be due to an

inadequacy in the general approach. In Section 3.4., another revision of the Binding Theory is considered. This approach does not invoke movement of anaphoric elements at LF; instead, it provides a unified account of the binding properties of anaphors in different languages by requiring X-bar compatibility of anaphors and SUBJECTs (cf. Nakamura 1987, Progovac 1992, Yang 1983).

3.4. The Relativized SUBJECT Analysis

The Relativized SUBJECT analysis (Progovac 1992; Progovac and Franks 1992) maintains the universal status of the binding principles (Chomsky 1981) by extending the independently motivated principle of X-bar compatibility to binding. By incorporating this requirement into the definition of SUBJECT, Progovac is able to account for the properties of domain extension, subject orientation, and for certain languages, blocking effects, that characterize variation in anaphoric binding across languages.

Standard theory (Chomsky 1981) establishes the canonical binding domain (i.e. governing category) for anaphors as the first maximal projection that contains the anaphor, a governor for the anaphor, and a SUBJECT, which may be [NP,NP], [NP,IP], or AGR.[12] The central feature of the Progovac analysis is relativization of the notion of SUBJECT according to the X-bar status of the anaphor, so that the categorial (X^0/XP) contrast between morphologically

simple and complex anaphors determines which type of SUBJECT appropriately defines the governing category. This is formalized as the principle of Relativized SUBJECT (Progovac 1992, 1993a):

(26) a. A SUBJECT for an X° reflexive can only be a c-commanding X° category (head) carrying person/number features, i.e. AGR.

b. A SUBJECT for an XP reflexive can only be a c-commanding XP specifier carrying person/number features, therefore [NP,NP] and [NP,IP].

Relativized SUBJECT assumes that the requirement of X-bar compatibility which governs relations between dependent syntactic elements in other modules of the grammar also applies to binding. For example, X-bar compatibility determines possible landing sites for movement, according to the Structure-Preserving Principle (Baltin 1982; Chomsky 1986a, following Emonds 1976). That is, the landing sites for head movement are limited to head categories, while maximal projections can only move to Specifier positions.

As discussed in Sections 3.4.1. and 3.4.2., the properties of subject orientation and long-distance binding associated with X° reflexives follow from the requirement of X-bar compatability. Under Relativized SUBJECT, AGR is the only appropriate binder[13] (i.e. SUBJECT) for an X° reflexive. Subject orientation follows from the independent relation of Spec-head agreement. By transitivity, the antecedent for the X° reflexive is the clausal subject coindexed with AGR.

The potential for long-distance binding also derives from the choice of SUBJECT. In languages with X° reflexives, the status of AGR plays a crucial role in establishing binding domains. Borer (1989) claims that in languages like Chinese, AGR is syntactically present, but morphologically null,[14] and thus anaphoric, while in languages with morphological material in AGR, it is referential. Anaphoric/referential variation in the status of AGR may be due to a binary parameter of Universal Grammar, with the values: anaphoric (-AGR) and referential (+AGR). In +AGR languages, referential AGR is absent in infinitival clauses. In -AGR languages, it is missing in both finite and infinitival clauses in languages. Apparent long-distance effects occur in languages with X° reflexives when referential AGR is absent. By assuming the Relativized SUBJECT principle, binding is reduced to the AGR parameter and the morphological properties of anaphors. As Progovac (1993b) notes, this is in accord with the requirement that parameters and triggers for acquisition involve only functional heads and the lexicon (Borer 1983; Chomsky 1991; Clahsen 1990).

3.4.1. Long-Distance Effects

Long-distance binding is defined as binding across a SUBJECT: [NP,IP], [NP,NP], or AGR. In languages that lack morphological AGR, such as Chinese, Japanese, and Korean, X°

reflexives may be bound across syntactic AGR, [NP,NP] and [NP,IP] SUBJECTs. Antecedents for X° reflexives may occur outside finite clauses, infinitival clauses, and noun phrases with lexical subjects. This is shown in the following Korean example from Yang (1983:183):

(27) John-in Bill-i Mary-ka Tom-iy caki-e tæhan thæto-lil silhəha-n-ta-ko sængkakha-n-ta-ko mit-nin-ta
John$_i$-TOP [Bill$_j$-NOM [Mary$_k$-NOM [Tom$_l$'s self$_{i/j/k/l}$ toward attitude]-ACC hate-ASP-DEC-COMP] think-ASP-DEC-COMP] believe-ASP-DEC
John$_i$ believes that Bill$_j$ thinks that Mary$_k$ hates Tom$_l$'s attitude toward himself/herself$_{i/j/k/l}$

Progovac (1992) assumes, following (Borer 1989), that when anaphoric AGR occurs in an embedded clause, it is coindexed with AGR in the higher clause, forming an AGR chain. In this case, the reflexive is bound to the local AGR which is anaphorically linked to AGR elements in higher clauses. As a result, the binding domain extends to the highest clause. By transitivity, the X° reflexive may refer to any clausal subject as well as the most local [NP,NP] subject.

Long-distance binding is limited to X° reflexives in languages that lack morphological AGR. In the Chinese examples (28a,b) below, the morphologically complex reflexive ta ziji can take antecedents only in the domain set by the occurrence of the first Specifier [NP,IP]: (egs., Cole, Hermon and Sung 1990:5)

(28) Zhangsan renwei [Lisi zhidao [Wangwu xihuan ziji /ta ziji]]
Zhangsan$_i$ AGR3 thinks [Lisi$_j$ AGR2 knows [Wangwu$_k$ AGR1 like self$_{i/j/k}$/himself$_{*i/*j/k}$
Zhangsan thinks Lisi knows Wangwu likes himself

In example (28), Wangwu is the Specifier SUBJECT (and XP binder) for the XP reflexive ta ziji, while anaphoric AGR is the SUBJECT for the X° reflexive ziji.

In languages that have overt AGR, X° reflexives are LD bound across [NP,NP] and [NP,IP]. The presence of anaphoric AGR in infinitival clauses accounts for LD binding of X° reflexives across PRO [NP,IP] SUBJECTS in languages like Russian.[15] Binding across [NP,NP] Specifier SUBJECTS results from the requirement of an X-bar compatible SUBJECT (i.e. AGR) for X° reflexives. In Russian, the X° reflexive can take antecedents outside NPs with lexical subjects (eg.(29a), Rappaport 1986:106), outside infinitival complement clauses (eg.(29b), Klenin 1974:30), but not outside finite complement clauses (eg.(29c), Rappaport 1986:103):

(29) a. Ja čital ego stat'ju o sebe
I_i read [his_j article about $self_{i/j}$]
I read his article about myself/himself

b. Mat' poprosila doč' nalit' sebe vody
$mother_i$ asked $daughter_j$ [PRO_j to pour $self_{i/j}$ some water]
The $mother_i$ asked the $daughter_j$ to pour $herself_{i/j}$ some water

c. Vanja znaet, čto Volodja ljubit sebja
Vanja knows [that Volodja loves self]
$Vanja_i$ knows that $Volodja_j$ loves $himself_{*i/j}$

3.4.2. Subject Orientation

Subject orientation of long-distance bound X° reflexives follows from coindexation, and thus coreference,

of the X° binder (AGR) with the [NP,IP] clausal subject (Borer 1989). In -AGR languages, an X° reflexive is bound to the first AGR which is part of an AGR chain; therefore, it can optionally refer to any clausal subject. This is shown in the Korean example (27) in Section 3.4.1.

In +AGR languages, like Russian, an X° reflexive is bound to the the first available AGR, which is anaphorically linked to higher AGR. By transitivity, it is coindexed with the subject of the clause. (eg., Comrie 1980:106)

(30) Petja velel mne kupit' sebe cvety
Peter$_i$ AGR1$_i$ told me$_j$ [PRO$_j$ AGR2$_j$to-buy self$_{i/j}$ some flowers]
Peter$_i$ told me$_j$ to buy himself$_i$/myself$_j$ some flowers

While object binding by X° reflexives in local contexts is accepted by some speakers of Icelandic (Thráinsson 1979), Russian (see Chapter 2, fn.12) and Serbo-Croatian (see Chapter 2, Section 2.3.1.), it is clear that when an X° reflexive is LD bound, the antecedent must be a clausal subject (Progovac 1991a:24). For example, in Serbo-Croatian, antecedents for X° reflexives occurring outside NPs with [NP,NP] subjects are limited to clausal subjects:

(31) a. Vera je dala Nini Kristininu knjigu o **sebi**
Vera-N be-3s gave Nina-D [Kristina-G book-A about self-L]
Vera$_i$ gave Nina$_j$ Kristina$_k$'s book about herself$_{i/*j/k}$

b. Vlado je dao Marku [Ivanov članak o **svojem** radu]
Vlado-N be-3s gave Mark-D [Ivan-G article-A about self's work-L]
Vlado$_i$ gave Mark$_j$ Ivan$_k$'s article about his own$_{i/*j/k}$ work

Although sebe invariably takes a clausal subject antecedent when long-distance bound, in local contexts many Serbo-Croatian speakers permit object antecedents, as in the following example:

(32) Doktor je pitao pacijenta o sebi
Doctor-N be-3s asked patient-A about self-L
The doctor$_i$ questioned the patient$_j$ about himself$_{i/j}$

Acceptance of clause internal object antecedents in Serbo-Croatian, Icelandic,[16] and other languages can be accounted for if X° reflexives are assumed to be exhaustively dominated by both NP and N (Helke 1971; Katada 1991; Progovac 1992).

(33)


If the reflexive is interpreted as an NP, then object antecedents are predicted to occur, as they do in languages, like English, which have XP reflexives. Unlike X° reflexives, XP reflexives are dominated by NP alone, and are thus bound by a Specifier, with antecedents restricted to local subjects and objects. Optionality exists only for the X° reflexive. In this case, if the XP value is selected, long-distance binding is ruled out, as shown in the Serbo-Croatian example (31) above.

The occurrence of [NP,NP] SUBJECTs (and antecedents) for X° reflexives is also predicted by the internal structure of the reflexive. That is, if the reflexive is

interpreted as an NP, then local Specifier SUBJECTs are eligible binders for the reflexive. This accounts for local binding of [NP,NP] in Korean (eg.(27)), Russian (eg. (29a)), and Serbo-Croatian (eg.(31)).[17]

3.4.3. Blocking Effects

Blocking effects in Chinese (Battistella 1989; Huang and Tang 1989; Tang 1989) and Japanese (Katada 1991) are accounted for by failure of AGR chain formation in the Progovac analysis (1992). In sentences like the Chinese example in (34), coreference between an X° anaphor and the matrix subject antecedent is impossible when an intervening clausal subject differs in person and/or number features. (egs., Huang and Tang 1989, 1991:263-4):

(34) a. Zhangsan renwei [wo hai-le ziji]
Zhangsan$_i$ AGR1 think [I$_j$ AGR2 hurt self$_{*i/j}$]
Zhangsan$_i$ thought that I$_j$ hurt himself$_{*i}$/myself$_j$

b. Zhangsan shuo [wo zhidao [Lisi chang piping ziji]]
Zhangsan$_i$ AGR1 say [I$_j$ AGR2 know [Lisi$_k$ AGR3 often criticize self$_{*i/*j/k}$]]
Zhangsan$_i$ said that I$_j$ feel that Lisi$_k$ always criticized himself$_{*i/*j/k}$

The X° reflexive ziji can refer to higher clausal subjects provided they agree in person and number features (See eg.(25)). Since AGR is coindexed with clausal subjects, when an intervening subject differs in person/number features, the AGR chain cannot form, and coreference between the X° reflexive and long-distance antecedents is blocked.

3.4.4. Binding Properties of Slavic Languages

The Relativized SUBJECT analysis accounts for properties of languages like Russian, Polish, and Serbo-Croatian which show LD binding that is restricted by finite clausal boundaries. For instance, recall that LD binding within the minimal finite clause occurs in Russian (Comrie 1980; Klenin 1974; Rappaport 1986; Růžička 1990). Russian allows antecedents outside infinitivals ((35a), Comrie 1980:106) and complex NPs, but not outside finite clauses ((35b,c), Rappaport 1986:103,106). Polish (Reinders-Machowska 1991) has the same coreference pattern, as does Serbo-Croatian (though in this case, object control infinitival constructions are absent) (see Chapter 2, Section 2.4.2.).

(35) a. Petja velel mne kupit' sebe cvety
Peter$_i$ told me$_j$ [PRO$_j$ to-buy self$_{i/j}$ some flowers]
Peter told me to buy himself/myself some flowers

b. Ja čital ego stat'ju o sebe
I$_i$ read [his$_j$ article about self$_{i/j}$]
I read his article about myself/himself

c. Vanja znaet, čto Volodja ljubit sebja
Vanja knows [that Volodja loves self]
Vanja$_i$ knows that Volodja$_j$ loves himself$_{*i/j}$

As discussed in Section 3.4.1., under Relativized SUBJECT, domain definitions for anaphoric binding are computed on the basis of several interacting elements of the grammar. The interaction of X° reflexives with AGR in the finite and non-finite clauses in Slavic languages results in the demonstrated distribution. Relativized SUBJECT provides

an account of the binding differences between languages that host referential AGR and those (such as Chinese) that do not. In addition, unlike standard Binding Theory and the LF movement analyses, the Relativized SUBJECT analysis is able to account for the lack of "i-within-i" that occurs in Slavic languages.

The i-within-i condition (Chomsky 1986:174) is defined as $*[_i \ldots \alpha_i \ldots]$. By stipulation, it rules out cases like $*[_i$ his$_i$ friend]. In English sentences with an anaphor in subject internal position in an embedded clause, the i-within-i effect prevents the embedded AGR from counting as an accessible SUBJECT (Chomsky 1981) in sentences such as:

(36) The men$_i$ knew [that [photos of **themselves**$_i$] would be on sale

The behavior of Russian and Serbo-Croatian X° reflexives in "i-within-i" constructions is predicted by the Relativized SUBJECT analysis. (egs., (37b) Rappaport 1986:112; (37c) Reinders-Machowska 1991:145)

(37) a. Nina je rekla Veri da je [nova knjiga o ***sebi**] pravi uspjeh
Nina-N be-3s told Vera-D [that be-3s [new book about self-L] real success]
Nina$_i$ told Vera$_j$ that a new book about herself$_{*i/*j}$ was a real success

b. *Vanja znaet čto [stat'ja o **sebe**] pojavilas' v gazete
Vanja-N knows [that [article-N about himself-L] appeared in newspaper-L]
Vanja$_i$ knows that an article about himself$_{*i}$ appeared in the newspaper

c. *Jan wie, że [artikuł o **sobie**]...
Jan-NOM knows [that [article-NOM about self]...]
Jan$_i$ knows that an article about himself$_{*i}$...

The examples in (35) are grammatical with sebi since the reflexive is bound within its governing category, the domain of the AGR SUBJECT, the minimal finite clause.

The absence of i-within-i effects in Slavic languages is due to the presence of an AGR SUBJECT in the lower clause which defines the governing category for X° reflexives. The Serbo-Croatian, Russian, and Polish sentences in (37) are ungrammatical because in each case the reflexive lacks an eligible antecedent in the governing category, resulting in a Principle A violation. Since AGR is SUBJECT for X° reflexives, an antecedent must be present in the embedded finite clause.[18]

3.4.5. Applying the Relativized SUBJECT Analysis

The Relativized SUBJECT approach offers a unified account of binding facts across languages that relies primarily on independently motivated mechanisms in defining the principles that determine the domain in which anaphors must be bound to antecedents. It provides an explanation for the cluster of properties typically associated with X° reflexives: subject orientation, long-distance binding, and blocking effects. The range of constructions[19] and languages it is able to account for increases its appeal for use in second language acquisition research where cross-linguistic comparisons are essential. For this reason, I will adopt the Progovac approach as the framework for the experimental component of this thesis.

NOTES

1. The following abbreviations are used in the Yang (1983:183) example:

TOP	topic marker	DEC	declarative marker
NOM	nominative marker	ACC	accusative marker
ASP	aspect marker	COMP	complementizer

2. In an earlier framework, Helke (1971) analyzed the structure of the English reflexive as $[_{NP}$pronoun $[_{N}$self$]]$ with a bound pronoun.

Possessive X° reflexives such as Serbo-Croatian svoj are assumed to be Determiners: $[_{DP}[_{D}$svoj$]]$.

3. Proposals concerning the logophoric (i.e. non-syntactic and therefore not subject to the Binding Theory) and/or pronominal properties of the Icelandic (X°) reflexive sig have been made on the basis of the behavior of this element in certain subjunctive constructions (cf. Hestvik 1990; Hyams and Sigurjónsdóttir 1990; Maling 1984; Sigurjónsdóttir and Hyams 1992; Thráinsson 1991). Apparent lack of structural restrictions on binding, including c-command, in these contexts suggests sig functions as a logophor as well as a syntactic anaphor.

The Relativized SUBJECT framework (Progovac 1993a) adopted in this study provides a syntactic account of LD binding of X° reflexives, including Icelandic sig, in subcategorized, adverbial, and relativized subjunctive clauses.

For discussion of logophoric use of anaphors in various discourse contexts, see Thráinsson (1991), Reinhart and Reuland (1991), and Sells (1987). Although examples of logophoric use of English reflexives are also reported (Cantrall 1974; Jackendoff 1968; Ross 1970; Zribi-Hertz 1989), many of these examples reflect emphatic use; others are marginal and/or are subject to dialectal variation. For purposes of the present study, analysis is limited to the behavior of syntactic reflexives within the scope of Principle A of the Binding Theory.

4. As discussed in Chapter 2, Section 2.4.2., object control verbs are not present in the eastern (Serbian) variants of Serbo-Croatian spoken in Bosnia-Hercegovina and Serbia. They occur marginally in western (Croatian) variants.

5. Use of an adjective between the pronoun and self is also possible in English: her usual self. This option supports that claim that XP anaphors are exhaustively dominated by NP only in the structure: $[_{NP}[_{SPEC}$her$][_{N'}[_{N}$self$]]]$. I would like to thank Ljiljana Progovac for pointing this out to me.

6. Hestvik (1990, 1992) has proposed an LF movement account for pronominal binding.

7. Alternatively, Chomsky (1986a) argues that reflexives move in order to be governed by their antecedents.

8. Pica (1987) assumes that Principle A of the Binding Theory applies to the anaphor-antecedent relation.

9. Chomsky (1986a:175) assumes LF anaphoric movement involves IP adjunction:

(i) LF: they α_i-INFL $[_{VP}$tell us about $e_i]$
They told us [about themselves]

Binding to object in the example below requires adjunction to VP, with a revision of c-command to allow the verbal object to c-command the VP-adjoined XP anaphor.

(i) LF: they INFL $[_{VP}\alpha_i$ tell us about $e_i]$
They told us [about ourselves]

10. This might yield a better result in a DP analysis (Abney 1987). In this case, the anaphor may optionally move to N or D and then via V to INFL (Progovac and Connell 1991). The same argument may account for the Serbo-Croatian object antecedents associated with local X^0 movement of sebi in monoclausal finite sentences (see Chapter 2, Section 2.3.1., egs.(24,25)).

11. This raises certain questions about the mechanism of saturation. Two solutions seem possible. In a DP analysis, it would be possible for sebi to move to D and acquire the necessary features by Spec-head agreement. Alternatively, since the i-within-i effect does not hold in Serbo-Croatian, it may be possible to accomplish saturation by coindexation of the anaphor and INFL alone. This approach would seem to require parameterization of the i-within-i effect, an unlikely fact about languages.

12. Following Iatridou (1990), Progovac (1992, 1993a) assumes AGR and Tense to be features on INFL rather than separate projections (cf. Chomsky 1991; Pollock 1989).

13. SUBJECTS are binders (Progovac 1992:672). Objects can act as binders; however, they do not define binding domains (Progovac 1993a:5).

14. Huang (1982) also noted the absence of morphological AGR in Chinese-type languages and associated LD binding in Chinese with the absence of AGR.

15. Alternatively, Progovac (1993a) suggests that INFL deletes at LF in infinitivals since it contains no unrecoverable material. Following Anderson (1982), Everaert (1984), Jakubowicz (1984), and others, Progovac (1993a) claims that Tense is anaphoric when dependent on Tense in a higher clause. This occurs in infinitival (and subjunctive) clauses. When Tense is dependent, it becomes recoverable. Anaphoric AGR is also recoverable. Therefore, under the Economy principle (Chomsky 1991), INFL will delete at LF since its contents are redundant. Since INFL becomes invisible at LF, AGR cannot serve as SUBJECT and the X° reflexive will be bound by the first available referential AGR in a higher clause, and by transitivity, to the clausal subject.

16. Locally-bound object antecedents for X° reflexives occur in Icelandic though Maling (1986) notes that such object antecedents show dialectal variation. (egs., Thráinsson 1979:291)

(i) Jón syndi Haraldi föt á sig
John showed Harold clothes for self
$John_i$ showed $Harold_j$ clothes for $himself_{i/j}$

(ii) Jón retti Haraldi fötin sin
John handed Harold clothes self's
$John_i$ handed $Harold_j$ his $own_{i/j}$ clothes

17. Under the LF deletion analysis (Progovac 1993a), local antecedents in infinitival clauses also reflect the X°/XP option. If the X° reflexive selects the X° option, then it will be bound by the first available referential AGR in a higher clause. However, if the reflexive selects the XP value, then the binding domain will be the embedded infinitival clause, with an [NP,IP] SUBJECT, the PRO antecedent.

18. In English, the XP reflexive must have an XP SUBJECT to establish the binding domain. In standard BT (Chomsky 1981), English permits reflexives occurring within complex NPs in subject position to refer outside the finite embedded clause (see eg.(36)) since the reflexive cannot be coindexed with the the clausal subject without violating the i-within-i condition. AGR cannot be a SUBJECT for an XP reflexive, so the domain extends. Progovac (1991a) argues that "pseudo-LD binding" in sentences like (36) results from the fact that the matrix [NP,IP] subject serves as SUBJECT. In sentences containing XP reflexives, such as English themselves, the matrix sentence is the governing category.

19. The Relativized SUBJECT approach (Progovac 1993a) also provides an explanation for long-distance binding of X° reflexives outside subjunctive clauses in languages such as Icelandic and Latin, and the lack of LD binding in subjunctive constructions in Russian and other Slavic languages with simplex anaphors.

Chapter 4

RESEARCH ON THE ACQUISITION OF REFLEXIVE BINDING

4.0 Introduction

The theoretical model of language proposed by Chomsky (1981) relies on the assumption that the abstract principles of Universal Grammar defined by linguists must be consistent with the constraints imposed by acquisition. Since Universal Grammar is defined as a modular system, the task for theoretical syntax is to identify the universal and parameterized principles that underlie language and account for their complex interaction, both within and across subsystems of the grammar. From the perspective of acquisition research, the introduction of the UG model has provided a wealth of testable hypotheses about the nature of innate linguistic knowledge. During the last fifteen years, research in theoretical syntax and acquisition has developed in tandem and has now reached a degree of sophistication that enables researchers to collaborate effectively on further development of these models.

Research in L1 acquisition derived initial benefit from the introduction of the Principles and Parameters approach (Chomsky 1981); in recent years a number of researchers have applied the UG model to the complex questions of second language acquisition (see, for discussion, Cook 1985; Flynn 1988; White 1988b, 1989a). Although the role of the L1 in L2

acquisition has been a significant factor to account for in L2 research, basic arguments concerning the availability of UG in the two contexts are similar.

This chapter briefly outlines these arguments and summarizes previous acquisition research examining learner knowledge of reflexive binding. Section 4.1. discusses the influence of learnability theory on L1 and L2 acquisition research on reflexive binding and reviews studies pertaining to the Subset Principle. Section 4.2. introduces the acquisition predictions of current morphological Binding Theory analyses and reviews the L1 and L2 research in these theoretical frameworks. The chapter closes with a discussion of the implications of morphological BT analyses for L2 acquisition research.

4.1. Learnability and Acquisition of the Binding Principles

Learnability theory (Wexler and Culicover 1980; Pinker 1984) states that grammars proposed in linguistic theories must be learnable by children on the basis of the linguistic exposure typically available to young children. The classic learnability problem is presented by the child's task of acquiring subtle properties of grammar that are not prominent in the input and are not explicitly taught. To account for the mismatch between the available input and the complexity of the adult native speaker's linguistic competence, Chomsky (1965, 1981) and others assume the

existence of an innate linguistic system, or Universal Grammar, that guides and constrains the child's developing grammar. Since grammars develop on the basis of the interaction between the UG component and input from the target language, the nature of the evidence available to the language learner is a further consideration.

Two types of linguistic input are, in principle, available to the child: positive evidence, which identifies possible, permitted utterances in the language, and negative evidence, which identifies utterances which are not permitted. Sentences the child hears in the target language constitute positive evidence. Direct negative evidence, in the form of error correction, provides information about structures that are ungrammatical in the target language. Acquisition based on indirect negative evidence relies on assumptions about what is not heard.

It is generally accepted that input available to children learning their first language is limited to positive linguistic data (Baker 1979; Lightfoot 1989). This claim is supported by child acquisition research that relies on production data produced in parent-child conversations. Research by Braine (1971) and Brown and Hanlon (1970) concludes that children do not receive or do not attend to negative evidence. For negative evidence to play a role in acquisition, it would have to be universally and unambiguously available. Pinker (1989) states that studies

(cf. Hirsh-Pasek, et al. 1984; Bohannan and Stanowicz 1988) that claim that children do have access to negative evidence do not show that this type of information about language is equally available to all children. Further, it is not clear that correction is useful to children since what is being corrected may not be clear; a corrected utterance may change several aspects of the syntax, morphology, phonological or semantic content simultaneously. Knowing precisely which feature of correction to attend to seems to be an insurmountable task for a child. In effect, there is no reason to believe the child would know which aspect of their utterance was being corrected. The notion that children make use of indirect negative evidence in the form of occurrence vs. non-occurrence of specific ungrammatical structures seems implausible. Pinker (1989) points out that the computational load associated with learning of this type is unacceptably high. Finally, it seems unlikely that children acquire language on the basis of utterances they never hear.

There are, however, certain acquisition conditions that would appear to require the use of negative evidence if acquisition were to rely solely on general inductive learning strategies. UG significantly reduces the need for negative evidence to rule out ungrammatical sentences associated with grammars not constrained by the principles and parameters of UG. Children simply do not produce such structures (Crain and Nakayama 1987); they do not adopt

grammars that violate UG, though they may construct grammars that do not conform to that of the target language.

White (1989a) discusses an acquisition situation that would present a learnability problem for either an L1 or L2 learner. If a learner adopts an overinclusive grammar, then the language generated by it would contain all the correct forms permitted by the target language as well as other, incorrect, forms. Retreat from this type of overgeneral grammar would seem to require direct negative evidence about the ungrammaticality of the offending forms. Consider an example from Baker (1979) that involves dative alternation in English:

(1) a. John told his problems to Mary

b. John told Mary his problems

c. John explained his problems to Mary

d.*John explained Mary his problems

Adoption of an overinclusive grammmar that stated that all dative verbs permit NP NP as well as NP PP constructions could not be abandoned in response to positive linguistic evidence. There is no positive input that (1d) is ungrammatical in English. Since negative evidence does not play a significant role in L1 acquisition, children have been assumed to be "conservative " language learners (Baker 1979). In other words, it is a condition on grammars that they be disconfirmable on the basis of positive evidence. A learning principle that meets this condition on acquisition

involves an ordering mechanism, the Subset Principle, (Berwick 1985; Wexler and Manzini 1987) which guarantees conservative learning in child acquisition. In recent years, a number of L1 and L2 acquisition studies have attempted to determine whether the proposed Subset Principle is empirically justified.

A second consideration from the perspective of learnability theory involves the lack of sufficient positive input data. The accuracy of young children's knowledge of abstract syntactic constraints despite the "projection problem" (Peters 1972) has provided support for the theory of Universal Grammar. In addition, this learnability argument applies to both L1 and L2 language learning.[1] If acquisition of an abstract syntactic constraint cannot be induced from the target language data on the basis of some general cognitive ability, and the learner demonstrates knowledge of the constraint, it can be argued that the source of this knowledge is innate--or in L2 acquisition, depending on the status of the constraint in the L1 grammar, transferred from the L1 to the interlanguage grammar.

The Binding Principles are good candidates for testing this model of acquisition. The structural requirement of c-command in defining coreference between referentially dependent nominal elements cannot be induced from the linear arrangement of syntactic elements. It requires knowledge of abstract relations between syntactic elements which are

hierarchically organized. To exhibit knowledge of the Binding Principles, the language learner must have knowledge of c-command restrictions as well as knowledge of locality restrictions on bound NPs. Because languages vary in terms of locality restrictions and the range of possible antecedents for reflexives, the possibility of adopting an overinclusive grammar of anaphora presents a potential learnability problem. Attempts to characterize and resolve this problem have motivated research in both L1 and L2 acquisition.

4.1.1. The Subset Principle and Binding Theory

Research on the acquisition of binding has shown the effect of refinement of the Binding Theory (as described in Chapter 3), continuing improvement in experimental procedures, particularly the task types used in child and adult studies, and theoretical development in both L1 and L2 acquisition. Research investigating the applicability of the Subset Principle (Berwick 1985; Manzini and Wexler 1987; Wexler and Manzini 1987) to the Binding Theory has been pursued in a number of studies in recent years. As discussed in Section 4.1., the learning mechanism known as the Subset Principle allows acquisition to proceed solely on the basis of positive evidence, by limiting the order in which grammars associated with UG parameter values may be adopted by language learners. This proposal assumed that languages

generated by parameters stand in a subset relation and that nested parameter values are associated with evermore inclusive grammars, meeting the Subset Condition (Manzini and Wexler 1987:429).

(2) Subset Condition

Given the parameter p with values $p_1,\ldots,p_n$, for every p_i and p_j, $1 \leq i,j \leq n$,

either $L(p_i) \subseteq L(p_j)$ or $L(p_j) \subseteq L(p_i)$.

This condition on parameters states that languages ($L(p_i)$) and $L(p_j)$) must stand in superset/subset relation. Linguistic data that motivates the most restrictive subset grammar is also compatible with any superset grammar. Parameters which satisfy this condition on the internal structure of UG parameters are subject to the Subset Principle. The Subset Principle protects the learner from adoption of overgeneral grammars, in this way assuring learning without recourse to negative evidence. The Subset Principle states that the language learner selects the parameter value that generates the smallest language compatible with the linguistic input (Wexler and Manzini 1987:61).

(3) Subset Principle

The learning function maps the input data to that value of a parameter which generates a language:

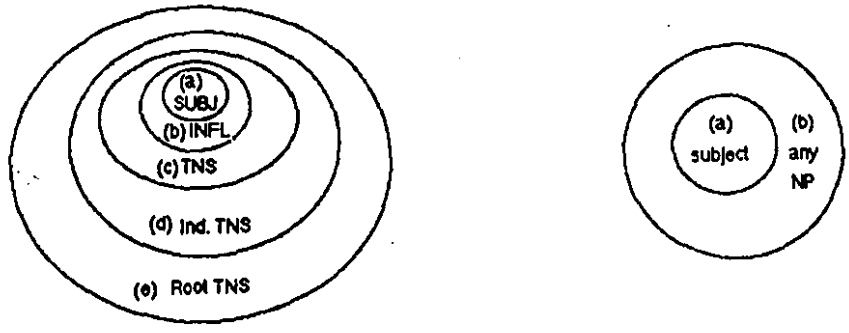
(a) compatible with the input data; and
(b) smallest among the languages compatible with the input data.

Wexler and Manzini (1987) further propose that these nested

parameter values constitute a markedness hierarchy, with the maximal subset language as the unmarked case. Children are predicted to start out with the smallest subset, shifting to larger superset grammars only on the basis of positive disconfirming evidence.

This proposal has been incorporated into the Binding Theory most explicitly by Manzini and Wexler (1987), although it was earlier applied to Johnson's (1984) parameterized approach to binding in languages like Icelandic and English by Jakubowicz (1984). The Governing Category Parameter and Proper Antecedent Parameter (Manzini and Wexler 1987) have parameter values associated with languages that are in subset relation to one another, as shown in (4).

(4) Governing Category Parameter Proper Antecedent Parameter



As described in Chapter 3, Section 3.1., the Governing Category Parameter establishes the binding domain in which anaphors must be bound (and pronouns must be free). The most restrictive GCP parameter setting requires that the governing category for an anaphor be the minimal category

containing a governor for the anaphor and a "subject" (i.e. [NP,NP] or [NP,IP]); in other words, the minimal NP or IP, the canonical governing category defined in standard BT. This is the English parameter setting. Languages like Russian (and, probably, Serbo-Croatian) are generated by parameter value (c) which permits antecedents for anaphors to occur outside noun phrases with lexical subjects and outside infinitival complement clauses. The governing category in Russian and Serbo-Croatian is the minimal finite clause. In Icelandic, reflexive antecents may occur outside subjunctive clauses. This is due to the operation of parameter value (d) which limits the binding domain to indicative finite clauses. Chinese, Korean, and Japanese have the least restrictive setting. Recall that in these languages, antecedents for reflexives may occur outside finite clauses. In these languages, the governing category is the matrix sentence.

Operation of the Subset Principle in language acquisition ensures that children do not adopt overgeneral grammars, requiring negative evidence for retreat to a correct grammar. Assuming the most restrictive parameter value is the unmarked, or default, value, children are predicted to initially adopt this value. This stage may be very brief, particularly when evidence of LD binding is abundant. Children are not expected to initially adopt a parameter value for a language that permits a greater range of LD

reflexive binding options than the target grammar allows. Adoption of such a parameter setting would lead to the learnability problem posed by overgeneral grammars; all the sentences that are grammatical in the subset language are also grammatical in the superset language, and the ungrammatical sentences generated by the superset parameter value would be absent from the subset language. Thus, the language learner will be unable to rely on positive evidence to attain the correct parameter setting. It is important to note that the Subset Principle does not explicitly require that children pass through the local reflexive binding stage, though the implicit assumption is that they do so.

4.1.2. L1 Research on the Subset Principle

A number of L1 and L2 acquisition studies have tested the Wexler and Manzini (1987) model. The Subset Principle has been argued to be an independent principle guiding L1 acquisition. Studies of children acquiring languages that permit only local binding are crucial to this claim. Children learning English-type reflexive binding would encounter a learnability problem if they adopted a superset parameter value. Results from studies of English children by Chien and Wexler (1987b, 1990), Jakubowicz (1984), Otsu (1981), Read and Chou-Hare (1979), Solan (1987), Wexler and Chien (1985) report almost perfect performance across a

variety of experimental tasks[2] by about age 6. However, since the Subset Principle guarantees initial adoption of the subset GCP setting by children learning English, studies involving very young are particularly relevant.

4.1.2.1 L1 Acquisition of Languages with Local Binding

Jakubowicz (1984) found that children as young as 3 select antecedents for reflexives within the embedded clause in biclausal sentences. The youngest children (n=7; age 3) in her study (n=28; age 3-5) locally bound English reflexives in over 90% of their interpretations of reflexives occurring in the embedded clauses of tensed biclausal sentences.[3] This is what the Subset Principle would predict.

In several experiments involving children age 2;6 to 6;6 (years;months), Chien and Wexler (1990) found that the youngest children tested (2;6-4;0) did not show evidence of knowledge of the domain restrictions on antecedents for reflexives. Although the authors attribute these results to task effects and response bias rather than linguistic competence, the youngest children in these experiments never do better than chance level in their interpretations of reflexives in biclausal sentences. Wexler and Chien (1985) (n=156) report that children's act-out responses showed only 13% local reflexive binding at age 2;6-3;0. LD binding was also reported in Chien and Wexler (1987b). In the first

experiment in this study (n=142), children age 2;6-3;0 locally bound the reflexive in only 36% of their responses. Assuming a task effect was responsible for the high levels of long-distance reflexive binding in these experiments, Chien and Wexler (1987b) used a different Act-Out task in the third experiment (n=174) in this series. Children responded at chance level until age 3;6-4;0. Chien and Wexler (1990:252) suggest that the responses of very young children (2;6-3;6) reflect response bias rather than knowledge of the locality condition on reflexives.

McDaniel, Cairns and Hsu (1990) also found evidence of LD binding of reflexives by children under the age of 4 in two experiments. In the first experiment (n=20; 3;9-5;4), results of Act-Out and Grammaticality Judgement tasks reveal lack of local reflexive binding in the grammars of 3 of the 4 children under age 4. In the second experiment (n=19; 2;9-6;7), the results of the same type of Grammaticality Judgement task showed that 4 of the 5 youngest children (2;9-3;8) permitted LD binding of reflexives.

The presence of LD binding in the grammars of very young children learning English does not support the claim that a Subset Principle guides L1 acquisition. However, the results of the Jakubowicz (1984) study strongly support the presence of this learning mechanism in L1 acquisition. As discussed in Section 4.3.1.2., this discrepancy may be

reconciled by adopting a morphological approach to Binding Theory. BT accounts that crucially rely on the X-bar status of reflexives provide justification for adoption of long-distance binding in the grammars of children learning languages that contain X° reflexives. If, as some have suggested, children initially assume English reflexives are X° anaphors, then early LD binding by English-speaking children would be expected.

4.1.2.2. L1 Acquisition of Languages with Local/LD Binding

Studies of children acquiring languages that permit LD reflexive binding provide other evidence that bear on the operation of a Subset Principle in L1 acquisition. Although counter-evidence exists (Hyams and Sigurjónsdóttir 1990, for children acquiring Icelandic), studies by Lee and Wexler (1987, Korean), Chien and Wexler (1987a, Chinese), and Jakubowicz and Olsen (1988, Danish) show evidence of predominent local binding of reflexives in child grammars.

Lee and Wexler (1987) found that children acquiring Korean selected local antecedents in 60% of their responses at age (3;6) (years; months). However, local preference is 100% by age (4;6) where it remains until age (6;6), the oldest age group in the study. Although adult controls selected the local antecedent in 38% of their responses, suggesting some native Korean speakers prefer local antecedents for the LD reflexive caki, it is surprising to

note that this group of children retains a 100% preference for local antecedents at age (6;6). However, this does not provide conclusive evidence of local-only binding in the grammars of these children. In the comprehension task used in this study, the LD antecedent option is not ruled out; therefore, these results, while persuasive, do not offer decisive evidence of adoption of the smallest subset GCP parameter value.

Another study that appears to support the existence of the Subset Principle is Chien and Wexler's (1987a) study of 150 Chinese-speaking children, ranging in age from (2;6) to (7;0). The results show a 90% preference for local antecedents for the (3;6-4;0) age group and that this high level of response favoring local antecedents for the Chinese LD reflexive ziji is maintained by older children tested in the study. However, these results are somewhat less convincing than the Korean data. The Act-Out task type used in this study (the Party Game) elicits the child's preferred antecedent choice. The LD antecedent may, in fact, be an acceptable, though dispreferred choice. More importantly, adult controls also selected the local antecedent in 90% of their reponses. This implies that local binding by children in this study may not reflect adoption of the smallest subset grammar. The factors that bias adult Chinese speakers toward local binding may also bias children.

The Danish study (n=80) (Jakubowicz and Olsen 1988) offers stronger support for the Subset Principle since the adult controls preferred LD antecedents 100% of the time. This compares with only 7% of the children in the youngest group (3;0-3;5) choosing the LD antecedent for the refelxive sig. It would appear that acquisition of the correct parameter value is extremely late in Danish, since the oldest (9;0-9;6) group of children tested only attain a 70% level of LD binding. At age 9, 6 out of 16 children continue to locally bind sig. Despite the short-comings of the Act-Out task methodology in terms of preference bias, these results provide much stronger support for the existence of the Subset Principle.

Results of a study by Hyams and Sigurjónsdóttir (1990) sharply contrast with the results reported above. Children in this study (n=105; 2;6-6;0) consistently LD bind reflexive sig. Even the youngest children tested chose the LD antecedent "twice as often" as the local antecedent. Adults chose the LD antecedent in 90% of the subjunctive and <95% of the infinitival test items. Only local antecedents are grammatical in indicative complement structures in Icelandic. Children in this study not only LD-bound the reflexive at a rate that increases over the age groups, but maintained this pattern across all sentence types. These results may provide disconfirming evidence for the Subset Principle, since these children not only adopt a superset

parameter value which allows LD binding, but apparently select an incorrect, larger value which permits LD binding across indicative clauses (as in Chinese).[4]

4.1.2.3. L1 Acquisition of Local Binding by Deaf Learners

A study which offers strong support for the existence of the Subset Principle involves another subject population which shows evidence of incomplete L1 acquisition. This study, by Berent and Samar (1990), investigates knowledge of English binding properties by deaf learners.

Prelingually deaf adults experience interference in acquiring their native language since the quality and quantity of linguistic data available to them are greatly reduced. Berent and Samar (1990) note previous research by Quigley and King (1980) and Berent (1983) that demonstrated that deaf subjects show English language behavior with evidence of greater difficulty in the use and interpretation of language specific, marked structures, though they knew unmarked (presumably, core grammar) properties of the grammar. In this study of the acquisition of the Governing Category Parameter, Berent and Samar (1990) tested 35 young adults assigned to low and high proficiency groups on the basis of standardized test scores (Michigan Test of English Language Proficiency). Using a multiple choice sentence comprehension task, they examined subjects' interpretations of pronouns and reflexives in English

sentences relevant to four GCP values: domain defined by (a) subject, (b) INFL, (c) Tense, and (d) Root Tense (matrix clause). Since the Subset Principle motivates selection of the narrowest governing category, they anticipated accuracy on the reflexive sentences and greater difficulty in recognizing that pronouns must be free in the domain of subject. They found strong support for the existence of the Subset Principle, particularly in the responses of the low proficiency group. Both groups (all 16 high proficiency and 12 of 13 low proficiency subjects) correctly bound the reflexives in the most restrictive "unmarked" governing category. However, the low proficency group were less successful in determining the "marked" binding domain for pronominals. The pronominal result is supported by convergent result of a second task, a spontaneous writing sample. Berent and Samar (1990) argue that these results constitute evidence of separate markedness hierarchies for anaphors and pronominals and the operation of the Subset Principle in acquisition by deaf learners of English.

4.1.3. L2 Research on the Subset Principle

The status of the Subset Principle in L2 acquisition is highly uncertain. The complexity of the L2 acquisition situation makes clarification of the role of the Subset Principle more difficult. One of the most critical questions involves the availability of UG in second (particularly

adult) language acquisition. There are several possiblities: 1) UG and the Subset Principle are both fully available; 2) UG is available and the Subset Principle is not; or 3) both UG and the Subset Principle are absent in second language acquisition.

If both UG and the Subset Principle are operative, learners of superset languages are predicted to initially select the ("unmarked") subset value, as children are presumed to do. In cases where the unmarked setting is incompatible with the input data, the learner would reset the parameter. If UG is available but the Subset Principle is absent in L2 acquisition, then learners would be expected to show evidence of UG-constrained grammars that may be overgeneral as a result of the absence of the Subset Principle. That is, they may adopt grammars that are permitted by UG, but are not consistent with the target language. The third possibility is that both UG and the Subset Principle are absent. Since this option entails the loss of the parametric environment required for operation of the Subset Principle, it would be difficult to demonstrate this experimentally. This suggests a further logical possibility--that of the presence of the Subset Principle and the partial or complete absence of UG. Assuming the Subset Principle operates only on parameters of UG which adhere to the Subset Condition, it would again be impossible to detect the presence of the Subset Principle if UG were

incomplete, disarrayed, or absent.

Other factors complicate investigation of the Subset Principle in L2 acquisition. Research design must take into account potential L1 transfer effects as well as the relation between relevant L1 and L2 parameter settings. Studies that provide evidence of the failure of this learning mechanism in L2 acquisition have been discussed by a number of researchers studying a variety of linguistic principles (White 1989b, Zobl 1988, among others). These studies generally indicate that the Subset Principle fails to operate in L2 acquisition.

Operation of the Subset Principle has been examined in studies of the interpretations of reflexives by speakers of an L1 that permits LD binding learning an L2 that does not. In this acquisition situation, adoption of the most restrictive subset parameter value cannot be due to knowledge derived from the L1 grammar. However, the presence of a subset value can only be verified by checking if learners rule-out the set of ungrammatical sentences permitted by the superset value. The ungrammaticality of LD (superset) antecedents for reflexives in the target L2 grammar must be clearly established. For example, a Chinese-speaking learner of English would be predicted to show early evidence of the English parameter value, since the English setting coincides with the (assumed) default setting. Chinese-type LD binding by these learners would fail to

support the contention that the Subset Principle guides L2 acquisition.

Results from L2 binding research testing the Wexler and Manzini (1987) model similarly fail to provide empirical support for the presence of the Subset Principle in L2 acquisition, except perhaps in the case of L2 acquisition prior to the onset of puberty, as argued by Lee (1992).

4.1.3.1. Lee (1992)

In two experiments of Korean speakers' interpretations of English reflexives, Lee (1992) found that post-puberty L2 learners were unable to reset the GCP parameter to the correct English setting. The first experiment tested 53 young adult L2 learners who acquired English in childhood, adolescence, and as adults. Two tasks, a Grammaticality Judgment (GJ) task and a Multiple Choice Comprehension (MCC) task, were employed; both tested tensed and infinitival complement structures and complex (i.e., possessive) NP structures containing reflexives. The GJ task contained both ungrammatical sentences with LD antecedents and grammatical sentences with local antecedents. The crucial judgements on the GJ task are the ungrammatical English sentences with LD antecedents because local binding is always an option with the Korean reflexive caki. Post-puberty L2 learners were significantly less accurate on their judgements of ungrammatical sentences than either native speakers or a

group of L2 learners who acquired English before the onset of puberty.

The MCC task elicited direct identification of antecedents in a multiple choice format. Antecedents identified in the MCC task by English native speakers and early L2 learners were consistently local. Post-puberty L2 learners[5] frequently selected LD or ambiguous LD/local antecedents,[6] which are ruled out by the English GCP parameter setting (Lee 1992:128). Similar response patterns showing LD binding on tensed (17% (Late Bilinguals); 27% (ESL)) and infinitival (23% (LB); 33% (ESL)) sentences suggests transfer of the L1 superset parameter value to the interlanguage grammar. This is supported by results on the sentences containing NPs with lexical subjects. Again, post-puberty L2 learners select LD antecedents for reflexives in 19% (LB) and 37% (ESL) of their responses.

When a 90% or higher accuracy criterion was applied in an analysis of individual subjects, Lee (1992:132) found no L2 learner whose age of arrival in the US was over 16 was able to reset to the correct English parameter value, and only 7 of 20 learners who arrived in the U.S. between the ages of 13 and 15 were able to reset to the unmarked subset value. Although she interprets this as evidence that UG is not fully available to post-puberty L2 learners, it is clear that the Subset Principle (if it is present at all) failed to guide acquisition by these L2

learners. The near-perfect responses of the early arrival group shows clear evidence of the operation of the Subset Principle on a fully articulated GCP.

Lee's (1992) second experiment replicates these facts with 78 subjects of varying ages (6;0-25,11), controlling for age of arrival within groups and length of time in the L2 environment (30-48 months) across groups. This experiment included a Yes/No Truth Value Judgment task with pictures (Chien and Wexler 1990) and an MCC task using tensed and infinitival biclausal sentences with reflexives and (control) pronouns to identify the GCP value selected by these L2 learner groups. In results that replicate those found in the first experiment, Lee (1992) found post-puberty L2 learners unable to reset the GCP to the subset value. In striking contrast again, L2 learners whose first exposure occurred between the ages of 8 and 13 exhibited almost identical patterns of response with the English control group.

Lee (1992) cites this pattern of response as evidence of full access to UG prior to the end of puberty. The mixed responses of the learner group that arrived in the US between the ages of 13 and 15 again suggest that, for some subjects in the group, access to UG had ended. She infers that UG knowledge of the GCP may be be blocked at approximately age 13 to 15. Prior to this time,[7] UG is available and the Subset Principle fully functional.

The learnability problem posed by adoption of a superset Governing Category Parameter setting is based on the assumption that direct negative evidence about the ungrammaticality of data incompatible with the parameter value is not available to language learners. In this case, learners who adopt a parameter setting associated with a superset language relative to the target language will be unable to arrive at the correct subset value. Retreat from an incorrect superset GCP setting to the smallest subset value has been examined in most of the studies of L2 binding acquisition completed to date. Studies by Cook (1990), Finer (1991), Finer and Broselow (1986, 1989), Hirakawa (1989, 1990), Lakshmanan and Teranishi (1992), and Thomas (1989, 1991b) consistently found evidence of adoption of superset grammars by L2 learners of English, though in some cases, the interlanguage GCP value did not match the L1 value. This was first reported in a pilot study by Finer and Broselow (1986).

4.1.3.2. Finer and Broselow (1986)

Testing the Subset Principle within the context of the Wexler and Manzini model, Finer and Broselow investigated L2 knowledge of English reflexive (and pronominal) binding by native speakers of Korean. Recall that Korean has a Root tense GCP value. This setting allows reflexives occurring in embedded tensed clauses to ambiguously refer to the embedded

or matrix clausal subjects. The GCP presents the appropriate environment for operation of the Subset Principle. Since these Korean-speaking learners of English have an L1 grammar that contains the widest superset GCP value, and English is the narrowest subset value, Finer and Broselow identify four possible outcomes in this acquisition situation: 1) the subset L2 value is initially adopted; 2) the superset L1 value is transferred; 3) an intermediate parameter value is selected; or 4) a "wild grammar" is adopted.[8]

A Picture Identification sentence comprehension task was used to test 6 L2 learners (1 low intermediate, 5 intermediate-advanced) included in the study. Subjects were asked to identify pictures (2 per item) which correctly illustrated 16 orally-presented test sentences. Sentence types included 4 tensed and 4 infinitival biclausal sentences containing reflexives. These include the following set of test sentences with reflexives, with alternating use of names in matrix and embedded subject positions: (Finer and Broselow 1986:164)

(4) a. Mr. Fat thinks (wishes/knows/believes) the Mr. Thin will paint himself.

b. Mr. Fat asks (tells/expects/wants) Mr. Thin to paint himself.

Aggregate results show that subjects locally bound (92%) the English reflexives in tensed biclausal sentences but permitted LD binding in 42% of the responses on infinitival biclausal sentences. This response pattern is

not consistent with either the L1 or the L2 parameter setting. Neither the Subset Principle nor the Transfer hypothesis was supported by the results. If the Subset Principle had guided these L2 learners, they would have locally bound the reflexives in both infinitival and tensed contexts. Finer and Broselow suggest these learners have adopted an intermediate GCP value which permits reflexive binding outside infinitival, though not tensed, complement clauses. This pattern is shown in languages like Russian which distinguish between tensed and infinitival clauses in terms of binding domain. The authors claim that adoption of this UG-constrained parameter value constitutes evidence of access to UG in L2 acquisition.

4.1.3.3. Finer (1991)

Finer and Broselow (1989) and Finer (1991) again consider the question of the applicability of the Subset Principle to second language acquisition in an expanded study that included 30 Korean and 20 Japanese-speaking learners of English. In this study, Finer (1991:373) used a similar Picture Identification task that presented 4 pictures (except for sentence type (5d) which involved 2 pictures) in simultaneous aural and written formats and tested 4 sentence types:

(5) a. Mr. Fat (expects/tells) Mr. Thin to paint himself.
b. Mr. Fat (threatens/promises) Mr. Thin to paint himself.
c. Mr. Fat (believes/thinks) that Mr. Thin will paint himself.
d. Mr. Fat (gives/draws) Mr. Thin a picture of himself.

Finer's results for the Korean and Japanese speakers replicate the pilot study findings. Again, L2 learners who are native speakers of these maximal GCP superset languages appeared to adopt an intermediate parameter setting. This was shown in a response pattern that permitted reflexive binding outside infinitival clauses but only local binding in the case of tensed complements. Finer (1991:360) reports a reduction in the strength of the observed effect in the second study but clear presence of the same effect. In fact, it appears that the incidence of LD responses on infinitival sentences is much less on the second study. While the pilot results on infinitival sentences included 42% LD antecedents, the group percentage for LD binding on infinitivals in the second study was only 8% for the Korean group and 15% for the Japanese group. Both L2 learner groups locally bound reflexives occurring in embedded tensed clauses.

Despite the relative weakness of the LD effect, particularly when comparing the Korean native speakers in the two studies, Finer claims that both Korean and Japanese-speaking L2 learners have adopted an intermediate GCP value. The Subset Principle cannot account for this acquisition pattern. An even more serious question involves retreat from

this intermediate superset value to the correct subset value for English since this presumably requires negative evidence. Finer suggests that the trigger for retreat from an overgeneral grammar may involve recognition of the marked value for the PAP. While this "Spanning Hypothesis" argument may fit the English facts, it is unclear how a Japanese-speaking L2 learner of Italian who had initially adopted the (Tense) intermediate superset GCP value would be able to restrict it to (INFL). In this case, the PAP setting would not provide any triggering information since both the L1 and the target language have unmarked (subject-only) PAP parameter settings.

Finer (1991:361) concludes that the "overall compatibility" of the interlanguage grammars of these learners as revealed in the GCP results fall with the constraints of UG. (See Thomas (1991c) for additional critical comment on the Finer study and independent support for his conclusions.)

4.1.3.4. Hirakawa (1989, 1990)

Hirakawa (1989, 1990) explicitly addresses the issue of the presence of Subset Principle effects in L2 acquisition of English reflexives by native speakers of Japanese. The 65 adolescent (age 15-19) L2 learners were enrolled in English foreign language (EFL) classes in Japan. In this respect, the Hirakawa study differs from others discussed here.

The instrument used in this study was a written sentence comprehension task in a multiple choice format. Five sentence types were tested. These include bi- and triclausal tensed and infinitival sentences designed to elicit GCP data and monoclausal sentences designed to elicit PAP data (Hirakawa 1989:74).

(6) a. John said that Bill hit himself.
b. Mary remembers that June said that Alice blamed herself.
c. June wants May to understand herself.
d. Tom says that Paul told Bob to introduce himself.
e. Bob talked to Paul about himself.

The results indicate that many of these L2 learners had not reset the GCP. Instead, the pattern of responses is consistent with the notion that these learners transferred the Japanese superset GCP value to their interlanguage grammar. This is shown in the levels of LD binding across tensed and infinitival clauses. These subjects locally bound the reflexive in tensed biclausal sentences 77% of the time and permitted LD antecedents in 23% of the cases. The percentage of LD binding in infinitival biclausal sentences is higher (44%); local binding for this sentence type is just 55%. The same pattern is shown on triclausal sentence, but here the level of LD binding is almost identical for the infinitival sentences (46%) and increased to 32% on tensed sentences.

These results differ from the results in studies by Finer (1991) and Finer and Broselow (1986) in which Japanese-speaking L2 learners showed LD binding in

infinitival sentences but not in tensed sentences. Although there are significant differences in L2 learner responses on infinitival and tensed biclausal sentences in Hirakawa's study, subjects in this study show evidence of LD binding in both sentence types. There are also significant differences between English native speaker control responses (99%) and L2 learners on tensed biclausal sentences. Hirakawa (1989:97) suggests that her subjects, who were younger and probably less proficient in English, may represent an earlier stage of acquisition. However, Lee's (1992) results on post-puberty L2 learners of higher proficiency also show evidence of transfer of the L1 maximal superset value. Although the number of subjects who had reset the GCP to the correct subset value for English is actually lower in the Hirakawa study (10 out of 65) than in the Lee study (7 out of 20, for the adolescent group in Experiment 1), Hirakawa claims that retreat from an incorrect superset value is possible and supports the view that UG is available in L2 acquisition. Lee (1992:223) argues that "UG in its entirety is only available to constrain the development of L2 learners' grammar for a limited period of time." This period ends sometime near the end of puberty (age 13-15). The fact that no subject in Lee's study after the age of 16 was able to reset the parameter for English reflexives supports her contention that UG is not wholly intact after puberty.

Assuming Lee's conclusion is correct, failure of the Subset Principle in her study may be due to lack of access to UG by post-puberty L2 learners. Hirakawa draws the opposite conclusion. She argues that parameter setting by 10 of the 65 low-proficiency EFL subjects in her study shows that UG is available to L2 learners. She argues that the Subset Principle alone is absent in L2 acquisition. Since Hirakawa's subjects overlap the "critical period" identified by Lee, it is difficult settle the issue of UG availability on the basis of a comparison between these two studies. What is clear from the results of these two studies is that the Subset Principle is not guiding acquisition for L2 learners of English who began EFL study at about age 12.

4.1.3.5. Thomas (1989)

Thomas (1989) investigated domain and antecedent restrictions in English reflexive binding by 97 speakers with 20 different L1 backgrounds. In her discussion, she focuses on data from 24 Chinese and 29 Spanish native speakers. Test sentences include biclausal tensed sentences and monoclausal sentences with two potential antecedents, a subject and an object NP. In addition, Thomas pragmatically biased half the test sentences in favor of the antecedent that is less preferred, in the case of the subject-object antecedent test sentences, or disallowed, in the biclausal tensed sentences. For the biclausal sentences, this involves

bias toward the ungrammatical LD antecedent in English, as shown in the following example (Thomas 1989:287):

(7) Mary angrily told me that Sue had spilled a lot of paint on herself.

Thomas found that L2 learners with L1 Chinese LD bound the reflexive in both neutral and pragmatically-biased biclausal tensed sentences. Responses that permitted an LD antecedent (i.e., LD and LD/Local readings) included 31% of the total responses in the neutral context and 51% in the LD-favored context. Thomas (1989:291) suggests this may reflect transfer from the L1 to the target grammar. However, Thomas notes that the response behavior of native Spanish speakers who LD bound antecedents at 40% (neutral) and 50% (LD-biased) cannot be accounted for by L1 transfer since Spanish reflexives must be locally bound. We will return to this problem in Section 4.2.2. since this result, which cannot be explained within the conceptual framework proposed by Wexler and Manzini (1987), does yield to the Relativized SUBJECT version of the Binding Theory.

What is clear is that the Subset Principle has failed to guide the Chinese (and Spanish) learners to the correct "unmarked" GCP value for English. Absence of a Subset Principle effect is also demonstrated in the overall results for L2 learners from various L2 backgrounds. Individual subject analysis for the L2 learners show that "only 23% (n=22) have acquired or partially acquired" (Thomas 1989:198) the English maximal subset value for the GCP.

4.1.3.6. Thomas (1991b)

Thomas (1991b) investigates access to Universal Grammar in L2 acquisition in this study of L2 learners' interpretations of reflexives (and pronouns) in second languages. Using an Elicited Imitation task and a Multiple Choice Comprehension (MCC) task, Thomas tested Japanese (n=70) and Spanish (n=62) adult (ESL) learners of English and Chinese (n=8) and English (n=33) adult (JSL) learners of Japanese in L2 environments. Although this study does not directly address the issue of the operation of the Subset Principle in L2 acquisition, it is also cast in the Wexler and Manzini (1987) framework. Conclusions regarding the Subset Principle can only be indirectly implied by her results.

Three sentence types were tested in the MCC task. The ESL instrument included biclausal tensed sentences, biclausal with relative clauses, and monoclausal sentence which test antecedent choice. Comparable sentence types were included in the JSL experiment except that the relative clauses sentences were replaced by sentences examining the c-command requirement on antecedents for reflexives.

Results from the MCC task on the reflexive sentences show that ESL learners do not apply linear order strategies in assigning coreference. Subjects do not select the closest NP, applying a linear Minimal Distance Strategy;[9] instead, "overwhelming portions" of Spanish and Japanese speakers

select structurally-defined local antecedents for English reflexives (Thomas 1991b:230). Although the majority of ESL learners select local antecedents for reflexives in embedded tensed clauses, aggregate results (Thomas 1991b:234) show that 28% of the lowest proficiency Japanese group's responses permit non-local antecedents. As proficiency increases, the amount of non-local binding decreases (Mid-level 24%; High 15%), suggesting a parameter resetting from a superset to a subset value occurs in the course of acquisition. However, this developmental pattern is less evident in individual subject analysis. Thomas (1991:228) examines individual subject response patterns to discover consistent (≥66%) binding patterns of these L2 learners. Applying this analysis to the same group of Japanese ESL learners, the picture is somewhat different (non-local: Low 10%; Mid 16%; High 16%). Correct local binding by subjects in these proficiency groups also does not show developmental change (Low 80%; Mid 76%; 84%).

Thomas also applies a strict interpretation of UG-sanctioned parameter settings to this data. Since no language permits LD antecedents while disallowing local antecedents, Thomas considered consistent LD-only responses as evidence of the absence of a UG constrained reflexive binding. Only one low-level Japanese speaker responded in this way. One low and one mid-level Spanish speaker also selected only LD antecedents. A total of 3 out of 132

subjects in the ESL experiment showed consistent LD-only binding. While the MCC task does permit subjects to reveal preferences rather than the full range of acceptable antecedents, Thomas attempted to raise the level of sensitivity to potential ambiguity in the test sentences by pretraining her subjects. This may have contributed to the strength of the result showing evidence of all the properties of particular GCP settings.

What is more puzzling is the level of non-local binding by Spanish speakers. Aggregate results (Thomas 1991b:234) are fairly close to the Japanese percentages: Low 23%; Mid 30%; High 22%. This compares with 5% non-local binding by the English control group. Individual subject analysis shows that 91% of the subjects in the Low proficiency group locally bind reflexives, but that only 70% of the Mid and 81% of the High proficiency subjects consistently (≥66%) select local antecedents. While 10% of both the Low and High proficiency Spanish ESL learners consistently choose non-local antecedents, 25% of the subjects in the Mid proficiency groups permit non-local antecedents. Applying Thomas' strict interpretation of valid GCP setting, 20% of the Mid proficency subjects consistently select the ambiguous LD/Local response. This suggests that 20% of these Spanish ESL learners have adopted the maximal superset value for the GCP. Since English input provides no evidence of LD binding and the Spanish GCP setting is assumed by Thomas to

be identical to that of English, the motivation for adoption of the "Root Tense" GCP value is unclear. This replicates the findings in Thomas (1989). We will return to discussion of this problematic result in Section 4.2.2.

For the majority of ESL learners who do not select antecedents outside tensed clauses, the Subset Principle may have worked. However, this cannot be firmly established because crucial sentences which would provide conclusive evidence of adoption of the English GCP value are not included in this study. To establish the presence of the English GCP value, sentences with reflexives occurring in noun phrases with lexical subjects must be included. Tensed biclausal sentences can establish the presence of the maximal superset value but not the absence of intermediate GCP values. On the other hand, evidence of adoption of the maximal superset GCP value by some ESL learners in this study thus does imply failure of the Subset Principle in the grammars of these particular learners.

Thomas (1991a) reports additional data from the same ESL experiment described in Thomas (1991b). This data includes a set of test sentences with reflexives in noun phrases with lexical subjects. Since the presence of an [NP,NP] subject defines the governing category for English, L2 learners who restrict antecedents to the local domain would appear to have adopted the English GCP value. Thomas' results are inconclusive on this issue. Her English control

subjects permitted binding outside the complex noun phrase at a rate of 51% (Thomas 1991a:171). There is no significant difference between this response level and that of either the Japanese or Spanish ESL learners in this study. The level of LD binding by this group of English native speakers is somewhat remarkable. Bennett (1994) reports 95% and Lee (1992:128) reports 89% local binding by English controls on sentences of this type on Multiple Choice Comprehension tasks.

Turning to the JSL experiment, an unexpected pattern of results shown by Chinese-speaking subjects (n=8) also may be due in part to operation of the Subset Principle. Thomas (1991b:229) reports that 25% of the Chinese speakers learning Japanese consistently (≥75%) assign local antecedents to reflexives in embedded tensed clauses. Since the L1 and L2 of these JSL learners have the maximal superset value, motivation for adoption of a subset value could be due to operation of the Subset Principle. However, the local antecedent is always possible in languages that permit LD binding. Furthermore, the local antecedent is preferred in Chinese, so this result could be due to transfer. In addition, Subset Principle effects on the GCP for the L1 English learners of Japanese (n=33) cannot be isolated from L1 transfer of the subset value since the L1 setting and the subset value motivated by the Subset Principle are identical.

4.1.3.7. Cook (1990)

This study directly addresses questions about the role of the Subset Principle in L2 learning and processing involved in reflexive (and pronominal) binding. Cook attempts to determine whether advanced L2 learners of English show evidence of access to Universal Grammar in resetting Governing Category Parameter values established in the native languages to the subset English value.

This study is of particular interest because the subjects are from three different language backgrounds: Japanese (n=16), Norwegian (n=17), and Romance (n=14) representing differing GCP values. The governing category for Japanese is the widest "Root Tense" domain, for Norwegian the "Tense" domain, and for Romance languages "INFL". Thus, in Japanese, it is possible for a reflexive to refer to an antecedent outside a tensed complement clause, while in Norwegian, antecedents may not occur outside a tensed clause, but they may be found outside infinitival clauses. The governing category for reflexives in Romance languages is even narrower. For example, in Italian, antecedents may not occur outside a tensed or infinitival clause, but may occur outside NPs with lexical subjects.

Using a computer-controlled sentence comprehension task, subjects were asked to directly identify antecedents in written sentences. This methodology yields data on locality and antecedent restrictions as well as response

time data which is assumed to provide an indication of the difficulty in reaching a decision on individual test items. Four reflexive sentence types were tested: monoclausal sentences, biclausal sentences with tensed and infinitival complements, and sentences with noun phrases with lexical subjects. Cook (1990) also tested pronouns in these structures and a set of biclausal sentences with bare infinitives; results on these sentences are not crucial to our discussion.

Error rates indicate Romance and Norwegian speakers pattern like English control subjects (n=14) on tensed complement structures (<10% non-local binding). However, the error rate for Japanese speakers(23%) differs significantly. Cook (1990:589) suggests this may be due to transfer of the L1 GCP setting from Japanese. LD binding of reflexives in infinitival complement structures is elevated for all three L2 learner groups. The results on the complex NP sentences suggests some subjects have not attained the English setting for the GCP. LD binding by the Japanese speakers occurred in 44% of the responses, and Norwegian (34%) and Romance (36%) speakers also show evidence of lack of parameter resetting. English native speakers LD bound reflexives in complex noun phrases in 16% of their responses. Response time data as well as comprehension data indicate the most difficult sentences were those containing complex noun phrases. Cook (1990:589) concludes that "at this level of English, effects

of L1 setting are not prominent" but notes that the overall high error rates for the Japanese speakers and lower rates for the Romance speakers might be due to differences in L1 Governing Category Parameter values.

Cook's findings are inconclusive with regard to operation of the Subset Principle in L2 anaphoric binding. There are clearly some L2 learners who have not adopted the English maximal subset value, but he suggests that the Subset Principle can be tied to relative order of difficulty on the four main sentence types. He proposes the following order of difficulty for constructions containing anaphors: monoclausal sentences, sentences with tensed complements, infinitival complements, and most difficult of all, sentences with reflexives in noun phrases with lexical subjects. This coincides with the order of difficulty Cook found on significantly correlated response time and comprehension measures. On the basis of this finding, Cook (1990) concludes that the Subset Principle may have some effect on L2 acquisition of anaphoric binding. Considering the fact that Japanese-speaking advanced learners of English LD bind antecedents in 41% of the infinitival sentences tested in this study even though local antecedents are possible in both Japanese and English, it seems unlikely that the Subset Principle can be said to have consisently guided L2 acquisition. Comparable error rates on the infinitival sentences by Romance and Norwegian speakers are

particularly interesting since the Romance L1 and the English L2 provide no input that would motivate LD binding in sentences of this type.

4.1.3.8. Lakshmanan and Teranishi (1992)

Lakshmanan and Teranishi (1992) attempt to determine whether Japanese speakers learning English (n=34) initially transfer the L1 superset value or adopt the English maximal subset value. Further, they examine the possibility of retreat from an overgeneral grammar generated by a transferred L1 superset value to the correct L2 subset value.

Subjects in 3 proficiency levels were given a written sentence comprehension task consisting of 10 finite biclausal sentences in both English and Japanese. This task differs from others in L2 binding studies in that it requires subjects to identify impossible rather than possible coreference. An example of a test question follows:

(8) John said that Bill saw himself in the mirror.

1. 'Himself' cannot be John. agree disagree
2. 'Himself' cannot be Bill. agree disagree

This format resulted in high levels of ambiguous responses on the Japanese control version of this task. This and related methodological issues are discussed in Section 3.

Results indicate that 14 of the 34 L2 learners tested in this study selected only local antecedents consistent with the English subset GCP value. Comparing the English

incorrect responses of the other 20 subjects with their responses to the same sentences on the Japanese version of the task, Lakshmanan and Teranishi found evidence of transfer of the Japanese GCP setting to the interlanguage grammar. Analysis of aggregate responses by proficiency group suggests parameter resetting may occur in the course of acquisition. In the lowest proficiency group (n=8), LD or LD/Local responses were selected on 34% of the test items. This decreases to 18% for the higher proficiency groups (n=15; n=11).

Lakshmanan and Teranishi (1992) conclude that this pattern of results cannot be attributed to operation of the Subset Principle. They contend that retreat from a superset to a subset grammar has probably occurred in the grammmars of the more advanced L2 learners and that this cannot be accounted for within the learnability constraints of the Wexler and Manzini model (1987). They offer another explanation which relies on the X°/XP distinction between reflexives in Japanese (zibun) and English (herself). We will return to discussion of the Lakshmanan and Teranishi (1992) approach in Section 4.2.2.

4.1.3.9. Summary: L2 Binding Studies & the Parameter Model

Studies of the interpretation of reflexives by L2 learners have generally shown that the Subset Principle does not force initial adoption of subset parameter settings. L2

learners in these studies are predominantly speakers of languages with superset GCP settings who are acquiring English, a language associated with the most restrictive GCP setting. Therefore, if the Subset Principle motivates initial adoption of the smallest subset parameter value, the learner will not encounter disconfirming evidence that would lead to subsequent adoption of a superset GCP setting. However, less proficient learners in these studies frequently exhibit the highest frequencies of LD binding. How then, researchers have asked, have the more advanced learners arrived at the correct English subset value? Clearly, the Subset Principle cannot account for either initial patterns or subsequent retreat from overgeneral grammars generated by superset GCP values. This acquisition pattern cannot be accounted for within the Wexler and Manzini (1987) model in the absence of negative evidence. In addition to the empirical and conceptual deficiencies of the parameterized version of the Binding Theory discussed in Chapter 3, the learnability component of this proposal also fails to account for the pattern of acquisition displayed in these studies.

L2 learners more frequently LD bind reflexives in infinitival complement clauses than in sentences with tensed complements. This pattern has appeared in the responses of L2 learners with L1 backgrounds that are either less restrictive (e.g., Japanese, Korean, or Chinese) or more

restrictive (e.g., Spanish) than the intermediate GCP setting implied by this response pattern. This cannot be accounted for on the basis of positive linguistic input in the case of L2 English and remains an unresolved issue within the confines of the Wexler and Manzini framework.

Although L2 learners show evidence of adopting interlanguage grammars that do not conform to the target language locality and antecedent restrictions on anaphoric binding, learners do not adopt grammars that are unconstrained by principles and parameters of Universal Grammar; they do not show evidence of "wild grammars". L2 learners do not, for example, permit LD antecedents across finite clausal barriers while disallowing coreference across non-finite clausal barriers. Even applying the most restrictive interpretation of a UG-constrained grammar of anaphora, Thomas (1991a,b) found only 2% of the L2 English learners in her study appeared to have adopted a parameter setting outside the range of permissible GCP settings.

Most studies of L2 acquisition of reflexive binding test the interpretations of adult L2 learners. Only one study examined age effects on access to UG for parameter resetting in L2 acquisition of reflexive binding. Lee's (1992) findings are especially interesting due to the range of tasks and sentence types used and the age groups tested. Results of this study suggest post-puberty learners may not have full access to UG and thus do not achieve native-like

grammars of anaphora in the second language.

Studies by Lee (1992) and Thomas (1991a,b) show that the UG principle of c-command is present in the grammars of L2 learners and that they apply this knowledge in assigning coreference between reflexives and their antecedents. These results indicate this invariant principle of UG is present in L2 learner grammars.

Some of the unresolved questions raised in previous studies of L2 reflexive binding will be shown in Section 4.2.2. to yield to current approaches to the Binding Theory.

4.2. Morphological Status of Anaphors & Acquisition of Binding

Current versions of the Binding Theory cite morphological complexity of anaphors as a defining characteristic of patterns of anaphoric binding among languages. In the Relativized SUBJECT approach (Progovac 1992), the morphological, and thus categorial, status of an anaphor partially defines the binding options available in a particular language. If an X° reflexive is present, the status of AGReement becomes relevant since AGR is the only X-bar compatible SUBJECT for an X° reflexive. Insofar as domain restrictions and the range of potential antecedents are correlated with the morphological status of anaphors, recognition of the X-bar status of the reflexive will guide the language learner to the correct grammar of anaphora.

Morphological approaches to anaphoric binding obviate

the need for recourse to a Subset Principle as a learning mechanism and provide a more unified account of the binding properties of anaphors across languages. Furthermore, as discussed in Section 4.1.2., the predictions of the Subset Principle and the Wexler and Manzini model are not fully confirmed by L1 research on anaphoric binding and fail to account for the acquisition pattern shown by learners in most L2 studies of reflexive binding. As will be shown, the predictions of current Binding Theory analyses more accurately represent the empirical findings.

4.2.1. Predictions for L1 Acquisition

Predictions for language acquisition under current BT approaches depend on identification of the morphological status of anaphors in the target language and several independent factors. In contrast to the possibilities raised by the Wexler and Manzini (1967) parameterized approach, Thomas (1993b) notes that "overgeneralization is not a threat" in current BT models. Since syntactic properties are associated with inherent features of anaphors, learners should select appropriate antecedents as soon as they recognize the morphological and lexical properties of an anaphor. What is crucial, then, is the initial status of reflexives. If children initially assume all pronouns are NPs, as Bloom (1990) suggests, then early local reflexive binding should occur in all languages.

4.2.1.1. Accounting for Early Local Binding

Citing evidence from English that very young children distinguish between the categories N and NP, Bloom (1990) claims that innate semantic principles lead children to initially categorize all pronouns (and names) as NPs. Only when presented with disconfirming evidence--perhaps the use of premodifiers (see, for discussion, Chapter 3, Section 3.2.1.)--do children reclassify certain NPs as Nouns. This occurs in languages like Chinese and Japanese which allow premodifiers with X^0 reflexives and leads children acquiring these languages to shift from an NP analysis of reflexives to an N analysis.[10]

While this approach accounts for local binding of reflexives by young children in English (Jakubowicz 1984; Solan 1987, among others) which has an XP reflexive, it also accounts for early local binding in languages that have X^0 reflexives (Danish: Jakubowicz and Olsen 1988; Korean: Lee and Wexler 1987; Chinese: Chien and Wexler 1987b).

4.2.1.2. Accounting for Early LD Binding

However, there is also some indication that LD binding does occur in the grammars of children learning English (ages 2;9-3;8) (Connell and Franks 1991; McDaniel, Cairns and Hsu 1990), Russian (Bailyn 1992), and Icelandic (Hyams and Sigurjónsdóttir 1990; Sigurjónsdóttir and Hyams 1992). This data is not consistent with Bloom's early NP analysis.

Others, including Progovac and Connell (1991) and Thomas (1993b), have suggested that children learning languages with XP anaphors who permit long-distance antecedents may have misclassified the anaphor as an X° element.

Assuming the Relativized SUBJECT analysis, the developmental status of AGR in child grammars is also a determining factor in the acquisition of anaphoric binding. Current debate on the presence of functional categories (cf. Clahsen 1990; Déprez and Pierce 1993; Guilfoyle and Noonan 1992; Radford 1990; among others) in grammars of very young children has not been fully resolved.[11] However, the predictions of Relativized SUBJECT are the same in either case. LD binding is predicted to occur if functional categories are absent. In this case, AGR would not be present and the governing category would therefore not be fixed. If, on the other hand, functional categories are present, under-specified AGR will be anaphoric (Progovac 1993: personal communication). LD binding similar to that found in -AGR languages, such as Chinese, is predicted to occur. Under-specification of AGR in early child grammars has also been argued on the basis of research on L1 binding in Icelandic by Hyams and Sigurjónsdóttir (1990).

Research on functional categories in child language has implications for L1 binding research. If children start out with a syntactic AGR projection lacking full specificity, and children initially misclassify XP reflexives as simplex

(N) anaphors or are acquiring languages with X° reflexives, they are predicted to adopt excessively broad binding domains. That is, if AGR is under-specified in the grammars of young children who assume the X° anaphor type, LD binding out of finite clauses is predicted to occur. In a language with XP anaphors and referential AGR, if AGR has been fully acquired, but the reflexive has not been correctly analyzed as complex, then LD binding will only involve infinitival embedded clauses. Progovac and Franks (1991) suggest that this analysis may be applied to results reported by Solan (1987). Solan found that English-speaking children permitted a significantly higher percentage of LD antecedents outside infinitival than tensed clauses.

Progovac and Connell (1991:13) argue that the triggers for restriction of the domain are the realization that relevant reflexives are morphologically complex and/or the acquisition of AGR[12]. Recognition of the XP status of reflexives in English is sufficient information for young children because XP anaphors take only XP SUBJECTS ([NP,IP] or [NP,NP]). The status of AGR is irrelevant for binding in languages with XP reflexives. On the other hand, children learning languages like Russian and Icelandic would require full specification of the aspectual and inflectional components of AGR in order to establish the correct binding domain for the X° reflexive in their languages. The only children who will not receive triggering information leading

the abandonment of LD binding are speakers of languages which have X° reflexives and morphologically empty (anaphoric) AGR.

Progovac and Connell (1991) also offer a reanalysis of Solan's (1987) finding that English-speaking children show a significantly higher percentage of LD binding of reflexives in infinitival as opposed to tensed complement clauses. Using Act-Out tasks, Solan tested 37 English-speaking children (ages 4-7) in three experiments. In the first experiment, two sentence types with reflexives were tested:

(9) a. The dog said that the horse hit himself.
b. The dog told the horse to hit himself.

Solan (1987:195) reports reduced levels of local binding on infinitival sentences (82%) as compared to tensed sentences (95%). Progovac and Connell (1991:13) argue that children acquiring English have adopted the Russian pattern; they have referential AGR but have misclassified the English reflexive as an X°. As soon as they reanalyze the English reflexive as an XP element, binding will be restricted to the minimal NP with a lexical subject or clause.

Thus, under Relativized SUBJECT, acquisition of the properties of reflexive binding are dependent on classification of the reflexive as an NP lacking independent reference and/or full specification of AGR. This is consistent with the view that parameter setting and triggers only include the lexicon and functional categories (Borer 1983; Chomsky 1991; Clahsen 1990).

Long-distance binding of English reflexives has been reported by Connell and Franks (1991) in a study of 13 English-speaking children (ages 3;7-8;6). Analysis of the results of a Truth-Value Judgement task using videotaped vignettes addressed both domain and antecedent orientation properties of early grammars. Five children permitted LD binding outside tensed clauses, binding to matrix subjects but not objects. Subjects in this LD group display domain and antecedent restrictions that coincide with Japanese-type languages, which allow LD binding outside tensed as well as infinitival embedded clauses and complex noun phrases. Strong subject orientation occurs in the grammars of all five children who reject object antecedents even in local (monoclausal) contexts.

McDaniel, Cairns and Hsu (1990) investigated English-speaking children's knowledge of the binding principles in two studies. Responding to an Act-Out task and an interview involving a Grammaticality Judgement task in the first study (n=20; ages 3;9-5;4) and the Grammaticality Judgement task in the second (n=19; ages 2;9-6;7), the subject groups showed consistent patterns of interpretation of sentences containing reflexives. In the first study, 3 of the 4 children under 4;0 did not obey Principle A. Overall, 20% of the children (all age ≤4;1) did not locally bind reflexives. One child (4;10) permitted LD binding across the infinitival, but not the tensed, clausal barrier. The authors (1990:131)

suggest that "free" use of reflexives in the grammars of young children results from incorrect classification of reflexives as Nouns rather than NPs. Noting the frequent use of the word self in production, the authors (1990:132) claim that "himself is treated like a possessive + self", meaning his "body"[13]. This analysis is confirmed in the follow-up study by McDaniel, Cairns and Hsu (1990) in which 4 of the 5 youngest children (2;9-3;8) apparently failed to recognize reflexives as NP anaphors. In addition, 3 of the children, ranging in age from 3;7 to 6;7, showed evidence of Principle A but LD bound reflexives outside infinitival clauses.

In terms of current BT analyses, the English-speaking children in these two studies show evidence of initial misclassification of the English XP reflexive as an X° reflexive.[14]

LD binding is also attested in the grammmars of Russian-speaking children (Bailyn 1992) and Icelandic-speaking children (Hyams and Sigurjónsdóttir 1990; Sigurjónsdóttir and Hyams 1992). Bailyn's (1992) study offers an LF Movement-to-INFL account of reflexive binding in the grammars of Russian-speaking children. Bailyn reports evidence of LD binding across (object control) infinitival and subjunctive clauses, but strictly local (94% on the first of two experiments) binding of reflexives in tensed complement structures. Russian permits binding outside infinitival clauses but not outside subjunctive complement

clauses[15], so these children have an excessively broad binding domain. Bailyn reports 53% LD binding outside subjunctive clauses in the first experiment (n=34; age 4;0-9;0) and, using different tasks, 26% in the second experiment (n=31; age 3;1-8;9). Bailyn (1992:328) attributes this pattern to lexical confusion due to the presence of the ambiguous complementizer čtoby in the COMP node of subjunctive clauses, leading to the crucial assumption that INFL is [+AGR][-TNS] in čtoby clauses. The Russian complementizer čtoby occurs in sentences with infinitival, or tensed, embedded adjunct purpose clauses as well as true subjunctive clauses. Bailyn argues that children are unaware of the lexical subtleties that result in overlapping use of čtoby and assume that LF movement can occur. When the correct subcategorization frames for this complementizer are present, LD binding across subjunctive clausal barriers should cease.

Blocking in subjunctives can also be explained in terms of the Relativized SUBJECT analysis (Progovac 1993a). In effect, INFL deletes (under the Economy Principle (Chomsky 1991)) when recoverable material only is present. Since the unrecoverable subjunctive particle čto-*by* occupies INFL, INFL is no longer deletable and extension of the binding domain may not occur. If children do not have a fully specified INFL and/or are unaware of the syntactic position of the subjunctive particle -by, then children would be

predicted to LD bind the Russian X° reflexive sebja.

Bailyn (1992:fn.15) suggests that confusion over an ambiguous complementizer also accounts for LD binding in Hyams and Sigurjónsdóttir (1990). In this case, children LD bind across tensed clausal barriers although Icelandic only permits LD binding outside subjunctive and infinitival complements. As described in Section 4.1.2.2., Hyams and Sigurjónsdóttir (1990) report LD binding consistently preferred to local binding of Icelandic sig by children (n=105; age 2;6-6;0) in their study. The authors claim that sig is actually a "pronominal anaphor" in subjunctive structures and thus not subject to syntactic binding. From the perspective of the Relativized SUBJECT analysis, other observations of the authors suggest another interpretation. Hyams and Sigurjónsdóttir (1990:80) point out that LD binding outside indicative clauses may be due to lack of full specification of INFL properties that govern mood, tense, and aspect--an analysis that yields to a unified analysis under Relativized SUBJECT.

Results from a subsequent study (Sigurjónsdóttir and Hyams 1992) indicate children show earlier LD binding outside subjunctive clauses than infinitival clauses. Again, using somewhat different terminology and citing work by Reinhart and Reuland (1991), Sigurjónsdóttir and Hyams (1992) interpret this to mean that logophoric pronouns which are not syntactically bound are acquired prior to Movement

at LF which accounts for LD binding of sig in the case of infinitival clauses. Again, Relativized SUBJECT is able to account for retreat from an overly wide binding domain on the basis of the development of aspectual and tense properties of the INFL projection.

While initial local binding of reflexives is more widely attested in the literature, interpretations of the use of self forms and the lack of full specification of INFL in the grammars of young children leave considerable room for speculation about the actual state of these grammars. From the perspective of L2 acquisition, consideration of the methodological problems and wider range of binding facts investigated in the L1 research provides a touchstone as new areas of study are opened in L2 binding research.

4.2.2. Predictions for L2 Acquisition

Applying the Relativized SUBJECT analysis to results of previous studies by Finer and Broselow (1986) and Thomas (1989), potential L1 transfer of anaphor type and AGR parameter value must be considered. Recall that the binding properties of XP anaphors include local-only binding and subject and object antecedents, while X° anaphors can take long-distance as well as local antecedents antecedents and are exclusively subject-oriented when long-distance bound. If L2 learners transfer an L1 X° anaphor type to the interlanguage grammar, they are predicted to show evidence

of LD binding of the misanalyzed L2 anaphors.

Progovac and Connell (1991) maintain that significantly higher levels of LD binding out of infinitival as compared to tensed clauses reported in Finer and Broselow (1986) cannot be attributed to transfer of both the L1 anaphor type and AGR parameter setting. In this study, the L2 English learners were native speakers of Korean, a -AGR language with an X° reflexive (see Section 4.1.3.2.). If L1 transfer of the L1 -AGR parameter setting had occurred, there would have been no distinction between infinitival and tensed clauses. LD binding would have occurred in both cases. Instead, it appears as though some of these learners acquired a Russian-type pattern by correctly adopting the +AGR parameter setting but failing to recognize the morphological complexity of English reflexive.

Progovac and Connell (1991) also address the empirical problem raised in Thomas (1989) (see Section 4.1.3.5.). In this study, Spanish L2 learners of English permitted more LD binding than Chinese L2 learners of English. Since Spanish does not allow extra-clausal LD binding and Chinese does, this finding cannot be attributed to L1 transfer. Progovac and Connell (1991:14) suggests that English AGR is "sparser" than Spanish AGR which leads Spanish speakers to incorrectly analyze English as -AGR. Compared to Chinese, English seems very rich and thus the Chinese speakers analyze English as +AGR. If the L2 learners in these groups initially assume

English reflexives are X°, then the Spanish learners would be predicted to allow more LD binding outside finite clauses than the Chinese learners, since the first finite AGR would close off the binding domain for the Chinese L2 learners who have correctly analyzed English AGR.

Evidence of misclassification of reflexives in a second language has also been cited in L2 binding research (Bennett 1994; Lakshmanan and Teranishi 1992).

As described in Section 4.1.3.8., Lakshmanan and Teranishi (1992) suggest that LD binding by Japanese-speaking L2 learners of English is largely found in the grammars of less advanced L2 learners. They (1992:27) propose that early LD binding results from initial transfer of the L1 Japanese X° anaphor type. Subsequent reanalysis of the English reflexive as complex, they argue, results in the correct local binding pattern for English. Because Japanese has XP reflexives (zibun-zibun "self-self", kare-zisin "he-self", etc.) as well as the X° reflexive zibun "self", this L1 knowledge may lead L2 learners to the correct grammar of anaphora in English. These L2 learners know that XP reflexives are restricted to local antecedents.

Although L1 knowledge may lead to successfully reanalysis of English reflexives, Lakshmanan and Teranishi (1992:27) maintain that Japanese-speaking L2 learners of English first assume English reflexives are X°. They cite evidence from a study by Hakuta (1976) of child L2

production data which suggests that the initial L2 reflexive is an X^0 form. The relevant data were produced by 4 year old Uguisu who acquired English as a second language in the US. The samples included in (18) are similar to those in the McDaniel, Cairns and Hsu (1990) study. In this case, the authors do not posit a non-anaphoric "bare" N stage. (Examples in (10) are from Table 7 of Lakshmanan and Teranishi 1992:27-28, drawn from Hakuta 1976:345)

(10) Sample 11: You have to do self, because remember I do self.
I will do it self.
You have to make it self, it's not hard to make.

Sample 12: He did it he-self.

Sample 20: They have to do it with their-selfs.

Sample 23: You can write it with your-self.

Sample 27: I can make toast with my-self.

Sample 29: He's scared of self.
His-self because he's scared of dog.

The authors suggest that the XP form emerges in Sample 12. Although they do not discuss it, Sample 29 is interesting because it again contains a 'self' form and also a possessive + <u>self</u> form. The morphological status of reflexives in early L2 as well as L1 grammars needs to be examined in future research.

Several studies have incorporated the cluster of properties associated with X° and XP anaphors into the research design (cf. Christie and Lantolf 1993; Hirakawa 1993; Thomas 1993a,b). Christie and Lantolf (1993) apply a multivariate analytical technique, called cluster analysis, to the response patterns of individual subjects (n=92) on a collection of items testing four properties: orientation, domain, morphological complexity of the reflexive, and c-command. The overall absence of cluster effects reported in the study may have resulted in part from inclusion of c-command as a relevant property.[16]

Finer (1991:367) suggests that for native speakers of English learning Japanese, "exposure to long-distance reflexives should be sufficient to trigger subject-only orientation". While this kind of interaction was prohibited in the Wexler and Manzini model (1987), it is a reasonable assertion in current BT models.

Thomas (1993a,b) and Hirakawa (1993) also examine two properties associated with English-type reflexive binding. They predicted that L2 learners with L1 Japanese who showed consistent local binding in their interpretations of English reflexives would also show evidence of the intra-clausal subject/object antecedent option available to speakers of languages with XP reflexives. Because these studies were originally designed to test the Wexler and Manzini (1987) model, they do not include test sentences such as (11) that

rule out impossible object antecedents.

(11) a.*Jack told Mary that Peter introduced herself.
b. Alice told Mary that Jane introduced herself.

The sentences in (11) are able to elicit information about the cluster of properties that is ruled out in current BT approaches. Object antecedents can only occur in local contexts.

Thomas' reanalysis is inconclusive. As she (1993a:6) notes, "these data fail to show that learners who admit long-distance binding require subject antecedents." It is possible that the lack of evidence of a correlation between subject orientation and LD binding in her results reflects optional selection of the XP value for the X° anaphor discussed in Katada (1991) and Progovac (1992). Since this option is found in Serbo-Croatian, Icelandic (Maling 1986), and Norwegian (Hellan 1988), it seems unlikely that correlations between the selection of object antecedents in monoclausal sentences (12a) and local binding in infinitival (12b) and tensed (12c) biclausal sentences would be definitive. (egs. from Hirakawa 1993:19)

(12) a. Tom showed Bill a picture of himself
b. Mary wants Ann to introduce herself
c. John said that Bill hit himself

To examine whether the predictions of new BT approaches are observed in L2 learners' interpretations of reflexives in second languages, Thomas (1993a) applied an LF movement analysis[17] to data obtained in a study of L2 learners of Japanese with L1 English background (n=39). In this study,

Thomas includes test items with LD non-subjects as potential antecedents. Using a Truth-Value Judgement task, she obtained largely inconclusive results. She did not find evidence that L2 learners' grammars are constrained as predicted by the LF movement approach. Progovac' model would also be unable to explain the problematic data in Thomas' study. Nearly half of the L2 Japanese learners in this study permitted LD binding of reflexives to non-subject antecedents. Citing data from Read and Chou-Hare (1979), Thomas (1993a:11) suggests a parallel in English child grammars which may offer another indication of the prevalence of this "unlawful" pattern.

Hirakawa (1993) reanalyzed her study (1989, 1990) within the Relativized SUBJECT framework. Hirakawa (1993:40) claims that elevated levels of LD binding by Japanese L2 learners of English on infinitival biclausal sentences show evidence of transfer of the L1 X^0 anaphor type and +AGR, the binding pattern attested in Russian. This is supported by her results on triclausal infinitival sentences of the following type:

(13) Ann knows that Mary told June not to hate herself

If subjects bind the reflexive to Mary (or June and Mary) but rule out Ann, then the Russian pattern resulting from the interaction of an X^0 anaphor and a +AGR is assumed to be present. Aggregate results on triclausal sentences with an embedded infinitival clause show that only 6% of the subject

responses permitted LD binding outside the finite clause. Hirakawa (1993:41) notes that, unlike the Wexler and Manzini (1987) parameterized approach, the Progovac model provides an explanation for this ±finite distinction that appears in her data. Hirakawa predicts a shift to the correct target reflexive binding pattern when Japanese L2 learners reanalyze English reflexives as morphologically complex.

4.3. Future Research in L2 Acquisition of Binding

Aspects of the current theory that need to be investigated in a variety of L1-L2 configurations require focus on the cluster of properties associated with different types of anaphors. Investigation of pronouns is also an unexplored area of L2 research. Filling this gap in our understanding of L2 acquisition of binding may benefit from recent L1 studies that explore the notion of two types of pronominal reference. Perhaps the greatest benefit L2 research is able to derive from child binding acquisition studies is in the area of methodology. While testing young children hosts its own set of problems, the problems of potential under-reporting of ambiguity in coreference, response bias, and the necessity of developing tasks able to distinguish preferences from underlying intuitions about the language are directly applicable to both L1 and L2 research.

NOTES

1. Although similar arguments have been made for L2 acquisition, the nature and extent of explicit information about the ungrammaticality of target language utterances available to adult learner exceeds that available to the L1 learner. Particularly in classroom settings, negative evidence, including error correction and explicit metalinguistic information about the grammatical structures, may result in retreat from an overgeneral grammar (Carroll and Swain 1993; White 1991b), though Schwartz (1993) argues that only positive evidence results in development of linguistic competence in the second language.

2. The methodology used in these studies may not fully represent the underlying grammars of the children tested. Primarily, two types of tasks have been used in studies of children's acquisition of reflexive binding: Act-Out tasks and Truth-Value Judgement tasks.

The use of Act-Out tasks has led to problems in analysis of results since these tasks reflect preferences. Truth-Value Judgement tasks appear to provide a more complete picture of the child's underlying knowledge of reflexive (and pronominal) binding (Crain and McKee 1985; Grodzinsky and Reinhart 1993; McKee 1992) since children's performance on grammatical and ungrammatical sentences can be compared.

The Truth-Value Judgement task allows pairing of sentences with single contextual interpretations so that judgements of what is permitted and what is <u>not</u> permitted can be separately elicited. The advantage of this technique is that, unlike Act-Out tasks involving toy manipulation (Chien and Wexler 1987; Jakubowicz 1984; McDaniel, Cairns and Hsu 1990; Solan 1987; Wexler and Chien 1985), the Truth-Value Judgement task does not tap only preferred interpretations for reflexives.

On the other hand, Grimshaw and Rosen (1990:196) argue that "it is completely legitimate...to construe the preference as mirroring grammatical knowledge." They argue that the preferences children show in responding to Act-Out tasks reveal that children's knowledge of the Binding Principles.

3. Dominance and linearity were tested in a second experiment of 3-5 year-old children (n=31). Jakubowicz (1984:170) found that children at age 3 correctly bind reflexives to c-commanding NPs in the local binding domain rather than to "the NP which is minimally distant from the expression in the linear sequence."

4. Hyams and Sigurjónsdóttir (1990:79ff.) report that bias in test items also resulted in LD binding by adults in 50% of the responses on sentences with indicative complements. They note that "the verb gefa 'to give' is a long-distance verb." Subjects were therefore faced with a dilemma: "the local antecedent is infelicitous because of the choice of the verb, whereas the long-distance antecedent is ungrammatical." This led to a chance level response pattern for the adults, but a much stronger tendency to LD bind the reflexive among the children.

5. Post-puberty L2 learners include 20 Late Bilinguals (LB) and 23 adults studying English as a Second Language (ESL).

6. For purposes of this discussion, LD and ambiguous LD/Local responses are combined since the parameter setting that permits LD antecedents also permits multiple readings. It is assumed that LD responses do not reflect the non-UG constrained grammar that allows ONLY LD antecedents (See Thomas 1989c for further discussion of this issue).

7. Lee (1992) also included a group of younger Korean/English bilinguals (ages 6;0-7;11) in the second experiment. These subjects show evidence of Principle A, though not Principle B on the Truth-Value Judgment task. Lee takes this as evidence that they applied a Minimal Distance Strategy which produces correct (closest NP) responses on the reflexive sentences and incorrect responses on the pronoun sentences. Lee (1992:206) further notes that subjects in this group selected LD antecedents (i.e., matrix subject antecedent) on the MCC task, and that there were significant differences between the accuracy levels of this group of young children and the English (adult) control group. However, these children also scored poorly on c-command sentences included in the MCC task, so it is not clear that c-command deficiencies mask knowledge of Principle A on the MCC task.

8. Adoption of a "wild" grammar would be signalled by a pattern of responses that were perhaps pragmatically motivated, rather than the result of syntactic knowledge. Non-UG sanctioned grammars could, for example, include the requirement that antecedents for reflexives occur outside embedded clauses, or be limited to LD object NPs.

9. Based on the Minimal Distance Principle proposed by Rosenbaum (1967), Carol Chomsky (1969) suggested that children applied a Minimal Distance Strategy (MDS) in assigning subjects to verbs in complement clauses. This nearest NP strategy can also be used to select local antecedents for reflexives. Use of the MDS strategy often produces the correct local binding pattern which is not due

to knowledge of the properties of anaphoric binding.

10. It is not clear what the trigger for reclassification would be in Russian or Serbo-Croatian since in these languages, the use of premodifiers with X^0 reflexives is possible but somewhat less than fully acceptable.

11. Déprez and Pierce (1993) cite evidence that INFL is present before the age of 2.

12. Under analyses by Radford (1990), and others, Progovac and Connell (1991) assume that young children lack the INFL projection, and thus AGR.

13. Connell and Franks (1991) suggest that "this usage persists for some time; utterances such as I washed my own self are not unusual even among children six and older."

Thomas (1991d) examines reflexives in spontaneous production data of English-speaking children. She also proposes an initial stage when children produce a bare $[_N$self] that is not classed as an anaphor. This noun has an "under-developed" Specifier position. She gives examples that include bare self in reflexive contexts(i, ii, iii) and with a premodifier (iv, v):

(i) Look hurt self (Eve 1;7)
(ii) Put it on by self (Adam 2;6)
(iii) Marky got foot under self (Ross 3;6)
(iv) You put em on your own self (Abe 3;7)
(v) No let me do it my own self (Adam 4;3)

During the subsequent stage, children interpret reflexives as genitive determiner + self, $[_{NP}[_{SPEC}$his$][_N$self]]. The anaphoric nature of the self forms is not recognized until the third stage. Thomas (1991d) suggests that it is at this point that the reflexive is subject to LF movement.

14. It is assumed that extra-sentential antecedents permitted by 2 of the children in the first study are attributed to other factors, but that Principle A does operate. McDaniel, Cairns and Hsu (1990:132) claim that because the NP status of the reflexive is not recognized Principle A does not apply and use is therefore free.

15. See Progovac (1993a) for discussion of similar blocking of LD binding outside subjunctive complements in Polish, Russian and Rumanian. She notes that in these languages, as opposed to Icelandic, the presence of a "subjunctive particle" in INFL coincides with lack of LD binding outside subjunctive complements in these languages. Tense in subjunctives is dependent on the matrix Tense (cf. Everaert

1986; Johnson 1984). Since subjunctive INFL hosts no independent Tense, INFL deletes up to recoverability at LF and the reflexive in the lower clause is bound by the matrix AGR. LD binding is blocked in these languages (unlike Icelandic) due to the presence of an "unrecoverable" subjunctive particle in INFL. Since only recoverable material deletes at LF, INFL (and thus AGR) are present at LF and binds an X° reflexive.

16. In addition, cluster analysis is susceptible to a variety of destabilizing factors. Christie and Lantolf (1993:24) identify a variety of potential second-order effects resulting from pragmatic (e.g., avoidance of ambiguity) or preference factors that may interfere with linguistic judgements of subjects.

17. Thomas (1993a) identifies the following predictions of the LF movement approach:

(i) If anaphors move at LF, then:
   a. Reflexives which are bound long-distance must have subject antecedents
   b. Reflexives which have non-subject antecedents must be locally bound.

The Progovac (1992) model makes the same predictions though X° reflexives may be bound to either local or long-distance antecedents. When bound locally, non-subjects are a possibility in some languages.

Chapter 5

L2 ACQUISITION OF ENGLISH REFLEXIVE BINDING BY NATIVE SPEAKERS OF SERBO-CROATIAN

5.0. Introduction

The theoretical model of language developed within the Principles and Parameters approach (Chomsky 1981) assumes that languages reflect constraints imposed by the needs of acquisition. This assumption has resulted in an increasingly successful interaction between theoretical syntax and theories of acquisition and subsequent enrichment of both kinds of theories. As syntacticians provide more unified analyses of complex interactions between abstract principles of the grammar, acquisition theorists testing this model of language attempt to determine how children and adults acquire these abstract principles and to account for deviations from the target language.

This chapter describes an experiment which tests the empirical validity of the Relativized SUBJECT analysis of binding (Progovac 1992, 1993a; Progovac and Franks 1992) and investigates the role of L1 transfer and Universal Grammar in the acquisition of a second language. The experiment investigates the extent to which L1 speakers of Serbo-Croatian have acquired the L2 English reflexive binding pattern, a pattern that differs from that of their native language.

To introduce the reader to the experimental component of this research, it is important to note that the L2 learners in this study have acquired English as a *foreign* language (EFL). This distinguishes them from subjects in studies of learners of English as a *second* language (ESL) (see, for discussion, Thomas 1991a, Lee 1992). EFL learners acquire languages in settings where the L2 is not widely spoken while ESL learners reside in an English-speaking environment.

The subjects in this experiment are adolescent and adult L2 learners who are speakers of the eastern Serbo-Croatian dialect of Mostar, Bosnia-Hercegovina. The English native speaker controls include adolescents and adults from the Upper Midwestern American English dialect area. The participants completed a series of proficiency tests and two experimental tasks, a Picture Identification task and a Multiple Choice Comprehension task. The results of the statistical tests of the experimental hypotheses and the implications of these findings are discussed in this chapter.

5.1. Points of Contrast & Potential L1 Transfer in L2 Binding

This study is designed investigate how speakers of a language with a long-distance X^0 reflexive interpret reflexives in a language that contains only local XP reflexives. In order to isolate the effects of possible

transfer of anaphor type from the L1 to the interlanguage grammar, the L1 and L2 languages must have identical +AGR parameter settings but differing anaphor types. Transfer of anaphor type may, in principle, be observed in either direction; that is, the XP anaphor may occur in the L1 and X° reflexive in the L2, or vice versa. However, transfer effects are more easily discerned when the X° reflexive is present in the native language and absent in the L2 because X° reflexives take local as well as long-distance antecedents in contrast to XP reflexives which are strictly local.[1] Violations of the binding properties of XP reflexives are evident when L1 transfer of an X° reflexive has occurred; antecedents would occur outside the minimal binding domain. If, instead, the L2 is a language with X° reflexives, violations would not occur since the binding properties of X° reflexives allow local as well as LD antecedents. For this reason, native speakers of Serbo-Croatian who are L2 learners of English constitute a subject population that conforms to an appropriate acquisition situation for investigating the development of reflexive binding in second language acquisition (i.e., the L1 has X° reflexives while the L2 has XP reflexives).

As discussed in Chapter 2, English and Serbo-Croatian show evidence of the narrowest distinction between languages in binding possibilities: local vs. long-distance binding of reflexives occurring in noun phrases with lexical subjects,

described in this study as complex NPs (CPNP). As shown in (1), the English XP reflexive must take a local antecedent which in (1a) is the subject of the noun phrase ([NP,NP]) while the Serbo-Croatian X^0 reflexive may optionally corefer with the long-distance clausal subject ([NP,IP]) or the local subject of the noun phrase ([NP,NP]).

(1) a. John$_i$ heard Mary$_j$'s description of himself$_{*i/herself_j}$

b. Ivan je čuo Vesnino mišljenje o sebi
Ivan$_i$ be-3s heard [Vesna$_j$'s description of self$_{i/j}$]
Ivan heard Vesna's description of himself/herself

Since both English and Serbo-Croatian have morphologically overt AGR, evidence of the +AGR parameter setting can be established, though its source cannot. In this acquisition situation, transfer of the +AGR parameter value cannot be ruled out, nor can it be clearly established. To establish transfer of an L1 -AGR setting, the target language must have morphologically filled AGR, and the L1 a -AGR setting. In this case, the L2 input provides positive evidence of overt AGR, and the effects of a transferred -AGR setting would be apparent in the L2 learner's treatment of X^0 reflexives in embedded finite clauses. It will be assumed in the following hypotheses that +AGR is present in the interlanguage grammar of the L2 learners in this study. This assumption will be tested in both experimental tasks.

Transfer of the L1 X^0 reflexive to the interlanguage grammmar would result in a characteristic pattern of

misinterpretation of English reflexives. Long-distance binding of English XP reflexives would imply that this group of L2 learners had (mis)analyzed the morphologically complex English reflexives as morphologically simplex X° reflexives. This would indicate transfer of the L1 Serbo-Croatian anaphor type to the interlanguage grammar. The Relativized SUBJECT analysis predicts that correct English reflexive binding pattern would appear when the morphological complexity of English reflexives is recognized.

5.2. Problem and Hypotheses

A basic acquisition problem facing native speakers of Serbo-Croatian learning English is that the L1 allows long-distance binding while the L2 does not.[2] Since the domain in which antecedents for X° reflexives in +AGR languages must occur is the minimal finite clause, these L2 learners must narrow down the locality domain appropriate to XP reflexives. This should be triggered by recognition of the morphological complexity of the English reflexives. If L2 learners detect the presence of overt AGR, but are not aware of the morphological complexity of the English reflexives, they would be expected to incorrectly interpret English reflexives in complex NPs and perhaps infinitival complement clauses by assigning long-distance antecedents. Predictions with respect to the underlying phenomena may be represented by the following hypotheses:

(2) (A) **Serbo-Croatian speakers learning L2 English apply the +AGR parameter setting.**

(B) **Serbo-Croatian speakers learning L2 English initially transfer the L1 X^0 reflexive anaphor type to the interlanguage grammar.**

(C) **Serbo-Croatian speakers learning L2 English who retain the +AGR/X^0 reflexive will be able to compute new binding domains in the interlanguage grammar.**

Hypothesis A assumes that at least L1-instantiated UG information is available to L2 learners. Specifically, it assumes that when L1 and L2 AGR parameter settings are identical, L2 learners apply this value in their interlanguage grammar. Although it is not possible to determine whether such L2 learners acquire +AGR on the basis of L1 transfer, UG access, or L2 input, the status of AGR can be empirically investigated, as we shall see. Hypothesis A states that these L2 learners will show evidence of overt morphological AGR in their interpretations of reflexives in English. Consistent with the restrictions imposed by the presence of overt AGR, they are not expected to LD bind L2 English reflexives outside finite clauses--a coreference pattern implying adoption of a -AGR parameter value.

Hypothesis B also assumes elements of the L1 grammar may be transferred to the interlanguage grammar. Hypothesis B predicts initial transfer of the L1 anaphor type to the target grammar.

If the predictions of hypotheses A and B are correct, Serbo-Croatian speakers learning English will permit long-

distance binding of English reflexives within the minimal finite clause. Specifically, these L2 learners will show evidence of binding across [NP,NP] SUBJECTS in their interpretations of reflexives occurring in noun phrases with lexical subjects (CPNPs). Since the SUBJECT for X° reflexives is AGR, the complex NP does not constitute the local binding domain, and clausal subjects are eligible antecedents for reflexives occurring in these nominal structures.

Hypothesis C assumes that binding domains for reflexives occurring in specific constructions must be computed. When the binding domain generated by a particular anaphor type/AGR parameter setting configuration is not instantiated in the L1, its occurrence in the relevant L2 environment indicates that L2 learners are not restricted to L1 binding domains. Evidence of extension of the range of structures permitted by an anaphor type/AGR parameter setting in the L2 indicates that L2 learners are able to compute new binding domains in second language acquisition and are not confined to surface transfer of L1 properties.

Computation of domains for constructions not found in the native language may require access to Universal Grammar in L2 acquisition, since knowledge of the relevant binding domains could not come directly from the L1.[3] Knowledge of the locality restrictions on binding of (X°) reflexives for constructions absent from the L1 suggests that L2 learners

do not simply transfer whole constructions to the target grammar, but that they resort to Universal Grammar when new constructions are encountered in the L2. If found, evidence of this type supports the view that a UG-constrained deductive system operates in the interlanguage grammar.

Hypothesis C predicts that L1 Serbo-Croatian speakers learning L2 English will LD bind reflexives occurring in (-AGR) infinitival complement clauses, despite the fact that the binding domain for reflexives occurring in these structures could not be established in the L1 because they do not exist.

Reflexives in both object control and Exceptional Case Marking(ECM) infinitival complements are tested in this study. As discussed in Chapter 2, Section 2.4.2., object control constructions do not occur in Eastern variants of Serbo-Croatian, including the dialect of Mostar. Object control structures are present in Polish, Russian, and other Slavic languages. As shown in Chapter 2, Section 2.4.2., X° reflexives occurring in these structures in Russian and Polish may take LD antecedents, as predicted by Relativized SUBJECT. Subject control structures are present in Serbo-Croatian, though use of finite complement constructions is preferred in Eastern variants.

Exceptional Case Marking of embedded lexical subjects of complement clauses by matrix verbs does not occur in Serbo-Croatian. This type of infinitival construction is

also absent in Russian and Polish. Therefore, there is no empirical data on which to base assumptions about predicted L2 learner interpretations of reflexives in clausal ECM constructions. For this reason, the predictions of Hypothesis C are limited to the assumptions of Relativized SUBJECT which predicts the occurrence of LD binding of X^0 reflexives across lexical and null [NP,IP] SUBJECTS of infinitivals in the second language.

Hypothesis C also predicts that L1 Serbo-Croatian speakers learning L2 English will LD bind reflexives occurring in infinitival complement clauses with object control, despite the fact no object control structures occur in the L1. Because this type of LD binding is not present in the Serbo-Croatian dialect of the L2 learners in this study, surface transfer can be ruled out. LD binding of English reflexives in infinitivals of this type provides strong evidence of transfer of the X^0 anaphor type to the interlanguage grammar and computation of binding domains in second language acquisition.

5.3. Experimental Design

The following discussion describes an experiment that tested these hypotheses by eliciting interpretations of English reflexives by L2 learners who were native speakers of Serbo-Croatian. Both age and proficiency factors are considered in analysis of aggregate and individual subject data obtained in sentence comprehension tasks.

5.3.1. Subjects

Subjects included 73 native speakers of Serbo-Croatian and 47 English native speaker controls. Experimental groups include: (1) 39 adolescent (age 13-15) L2 learners and (2) 34 adult (age 18-47) L2 learners. English native speaker controls include: (1) 25 adolescents (age 13-14) from Appleton, Wisconsin and (2) 22 adults (age 18-39) from Oshkosh, Wisconsin.

Table 5-1 provides a more detailed breakdown of the age and proficiency levels of the subjects included in the study. The original subject pool included 130 L2 learners and 52 English native speaker controls. In the experimental group, 21 failed to show evidence of sufficient proficiency in English on the proficiency test battery. A second control was used to eliminate subjects who applied a Minimal Distance Strategy on a set of control items in the Multiple Choice Comprehension Task. Thirty-six subjects in the experimental group were dropped for consistent (≥75%

incorrect) selection of antecedents for reflexives indicating use of this linear order strategy. Many of these subjects also performed below the median level on the proficiency tests.

Five English controls were also dropped from the subject pool as a result of their apparent use of a Minimal Distance Strategy in responding to the MCC task items. Again, a level of ≥75% incorrect was used as a cut-off.

The experimental subjects are speakers of the eastern Serbo-Croatian dialect of Mostar, Bosnia-Hercegovina. Exposure to English outside the classroom was limited to films, pop music, and occasional interactions with tourists. Limited English language cable television broadcasts were first aired in 1986. English magazines and newspapers were not sold in Mostar nor were books in English easily available. No subject reported previous residence in a foreign English-speaking country. Classroom study of English was not available to any subject prior to age 9-10. Subjects in the adolescent group as well as those in the Aleksa Šantić group received 45 minutes per week of English classroom instruction in grade 4 (age 9-10) and two 45 minutes sessions per week in Grades 5 through 8. The adolescent L2 learners and controls were enrolled in Grade 8 at the time of testing.

English native speaker controls in this experiment were from the Northern Midwestern dialect region of the United

States. The adolescent subjects were from Appleton, Wisconsin, and the adult controls were undergraduate students at the University of Wisconsin-Oshkosh. With the exception of 3 subjects reporting elementary school/family exposure to German (2) and Arabic (1), L2 contact for the control groups was limited to classroom foreign language study. None indicated they were proficient speakers of a second language.

In the tables found in this chapter, subject groups are identified as follows:

NS-ADOL = English native speaker adolescent control group

NS-A = English native speaker adult control group,

L2-ADOL = Adolescent L2 learner group

L2-A = Adult L2 learner group

CON = English native speaker control group

L2-LO = Low proficiency L2 learner group

L2-HI = High proficiency L2 learner group.

TABLE 5-1: SUBJECT GROUPS BY TESTING SESSION

Experimental Groups (n = 73)

Location Mostar, B-H	n =	(original)	Age Range	Proficiency LO	 HI
Hunza Humo	16	(28)	13 - 15	12	4
Braca Simić	7	(23)	14 - 15	6	1
'14 Februar'	16	(24)	13 - 15	13	3
		Total L2-ADOL = 39 HI = 8 LO = 31			
Aleksa Šantić	16	(21)	18 - 19	3	13
Dom Mladih	2	(15)	18 - 29	2	0
Univ. Mostar (undergraduates)	11	(13)	20 - 28	7	4
Univ. Mostar (postgraduates)	5	(6)	30 - 47	1	4
		Total L2-A(dults) = 34 HI = 21 LO = 13			
		Total L2-HI = 29 Total L2-LO = 44			

Control Groups (n = 47)

Location Wisconsin	n =	(original)	Age Range
James Madison (Appleton)	25	(27)	13 - 14
		Total NS-ADOL = 25	
UW-Oshkosh (undergraduates)	22	(25)	18 - 39
		Total NS-A = 22	
		Total CON(trols) = 47	

TABLE 5-2: GENDER COMPOSITION OF SUBJECT GROUPS

Table 5-2a: Gender Composition by Age Group

	Female	Male	Total
NS-ADOL	13 (52%)	12 (48%)	25 (100%)
NS-A(dult)	16 (73%)	6 (27%)	22 (100%)
L2-ADOL	26 (67%)	13 (33%)	39 (100%)
L2-A	26 (76%)	8 (34%)	34 (100%)
Total	81 (68%)	39 (33%)	120 (100%)

Table 5-2b: Gender Composition by Proficiency Group

	Female	Male	Total
CON	29 (62%)	18 (38%)	47 (100%)
HI	20 (69%)	9 (31%)	29 (100%)
LO	32 (73%)	12 (27%)	44 (100%)
Total	81 (67%)	39 (33%)	120 (100%)

5.3.2. Procedure

The complete battery of proficiency and experimental tasks was administered to groups of subjects at single sessions. Time for completion of various sections of the test battery was limited in order to standardize the procedure. Experimental groups completed the tests in about 50 minutes. The control groups spent an average of 35 minutes on the tests.

Oral instructions in English were given to all groups. Written versions of these instructions were in English for

the control groups and in Serbo-Croatian for the experimental groups.

5.3.3. Materials

Testing consisted of two parts: (1) a set of proficiency tasks and (2) a set of experimental tasks. Two types of written sentence comprehension tasks were used to test interpretation of English reflexives: (1) a picture identification task and (2) a multiple choice questionnaire.

Two experimental methods were used in order to follow the pattern of interpretation of reflexives across task type. Although the use of the written multiple choice task format permits comparison of results with other studies of L2 reflexive binding (see Chapter 4, Section 4.1.3.), this task format is subject to preference bias.

In English, sentences such as example (3) are ambiguous; the clausal subject Peter and the object of the verb Alan are both grammatical syntactic antecedents for the reflexive himself.

(3) Peter gave Alan three snapshots of himself

However, as shown in the responses of control subjects in L1 studies by Read and Chou-Hare (1979) and Goodluck and Birch (1988) and L2 studies by Hirakawa (1989, 1990) and Thomas (1989, 1991a,b), adult native speakers do not equally select these potential antecedents. Responses that reveal preference for clausal subjects reported in these studies

(e.g., 81% restricted antecedents to clausal subjects in Read and Chou Hare) reflect performance or pragmatic factors and do not fully reveal the underlying knowledge of reflexive binding. Further, preference can even mask the availability of disfavored antecedents (Thomas 1991c). For example, only 25% of the English controls in Hirakawa's (1989) study accepted both subject and object antecedents. Recognition of ambiguity in sentences containing reflexives may also be a problem for native speakers of languages that permit both local and long-distance binding of reflexives. Hirakawa (1989) found Japanese speakers favored LD over local antecedents for the X° reflexive zibun, and Lee and Wexler (1987) report adult Korean speakers prefer LD antecedents for the X° reflexive caki.

Multiple choice sentence comprehension tasks ask subjects to directly identify antecedents, including all potential antecedent options in the list of choices. However, if Thomas (1991c) is correct that "preference can be strong enough to prevent speakers from recognizing underlying ambiguity", then bias in the results is to be expected. This problem may be partially addressed by the use of a training session prior to the experimental procedure to heighten subjects' sensitivity to potential ambiguity in the test items. However, as pointed out by Grimshaw and Rosen (1990:196), "it is completely legitimate...to construe the preference as mirroring grammatical knowledge." Subjects

"prefer to interpret sentences in a way that is consistent with the binding theory". In effect, preferences reveal reflexive-antecedent coreference relations that are permitted by the speaker's grammar.

To obtain a more complete picture of the permitted, as well as preferred, antecedents for reflexives in L2 English grammars of native speakers of Serbo-Croatian, a second task type was used in this experiment. The picture identification format asks subjects to identify the picture(s) that illustrate the test sentence, individually judging each of 4 pictures. By requiring subjects to judge and mark each picture separately, it was expected that subjects might reveal more about their underlying knowledge of reflexives.[4] A training session to reduce task difficulty and raise the issue of potential ambiguity in the test sentences was given immediately prior to the Picture Identification task.

Use of two experimental task types has the advantage of permitting comparison of subjects' responses across task type. If a particular pattern of response occurs on both tasks, this provides stronger evidence of a pattern of reflexive interpretation than use of a single task type.

The experimental procedure was standardized in the following ways. Control and experimental subjects completed the tasks in the same order. With the exception of the Vocabulary test which examines knowledge of lexical items

used in the experimental tasks, all participants in the study were given the same set of tasks. The task order was as follows: Cloze test, Reflexive/Pronoun Lexical test, Picture Identification task, Complex NP test, Gender and Biclausal test, Multiple Choice Comprehension task, and Vocabulary task.

5.3.3.1. Screening Procedures

Two types of screening procedures were applied to the original subject population. The first determined whether subjects had sufficient proficiency in English to complete the experimental tasks, and the second gave information about subjects' use of a non-syntactic Minimal Distance Strategy[5] (MDS) in responding to reflexive test questions.

The proficiency task set included a Cloze test of general L2 proficiency (see Appendix 5-1) in addition to tasks investigating knowledge of the syntactic structures and lexical items appearing in the experimental tasks.

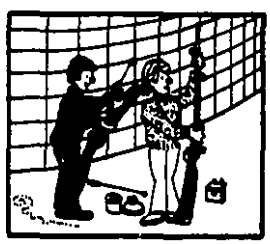
Cloze tests are considered reliable indicators of L2 proficiency (Brown 1983; Jonz 1990). In a Cloze test, subjects read a text with regularly deleted words. Their task is to guess the missing words in the passage. The 30 item Cloze test used in this experiment applied a fixed-ratio deletion procedure (i.e., removing every nth word from the text). Subjects were scored on the basis of approximate correct answers; exact and acceptable (i.e., syntactically

and semantically appropriate) guesses were scored equally.

Syntax and lexical tests that specifically examine subjects' knowledge of structures and vocabulary used in the experimental tasks include: a Reflexive/Pronoun Lexical test (7 items with picture prompts), a Complex Noun Phrase (CPNP) test (4 items), a Gender[6] (4 items) and Biclausal test (4 items), and a Vocabulary task (12 items: English to Serbo-Croatian).

The Lexical test included 7 items testing knowledge of the distinction between lexical pronouns and reflexives in monoclausal sentences. On the basis of antecedent selection, this task investigates whether subjects are able to differentiate pronouns from reflexives. A practice item involving another structure was completed during the instruction session. Subjects were asked to circle the correct answer. Each test sentence in the Lexical test was accompanied by a picture prompt, as shown below.

FIGURE 5-1: Lexical Test Reflexive Sentence



John and Peter are cleaning guns.
John shoots himself.

John shoots: John Peter

FIGURE 5-2: Lexical Test Pronoun Sentence

Vera washed a car with Nina.
Nina splashed water on her.

Nina splashed water on: Vera Nina

The test of knowledge of constituent structure involving complex noun phrases (CPNP constructions) contained 4 items (see eg.(4)). This task was designed to test whether subjects recognized complex noun phrases as syntactic constituents. To answer the question, the subject must identify the complex NP, not only the head noun.

(4) The man with the umbrella fell down.
The man with the hat sat down.
Who sat down? _____

The same test format was used to examine subjects' comprehension of biclausal constructions (4 items) and recognition of the gender of pronouns (4 items). The Biclausal test (eg. (5a)) examined subjects' ability to comprehend biclausal structures which would appear on the experimental tasks. The Gender task (eg. (5b)) investigated subject knowledge of pronominal gender. In addition, this provided a second measure of differentiation between pronouns and reflexives. For example, if in example (5b) the subject selected response (a), this would suggest that lexical knowledge of pronouns was incomplete.

(5) a. Nina loves pizza. Her mother does not like to cook.
(a) Nina knows that her mother will never make pizza for her.
(b) What does her mother think that Nina loves pizza.
(c) Nina wants that her mother make pizza.
(d) Her mother knows pizza that Nina loves.

b. Vera and John went swimming.
(a) John pushed him in the water.
(b) John pushed her in the water.

Task-related proficiency tests focus on the actual constructions used in the experimental tasks. This avoids

problems encountered in the use of standardized proficiency tests which do not establish knowledge of the relevant syntactic structures. However, in studies which investigate binding across [NP,NP] SUBJECTs, subjects' knowledge of complex NPs could be examined in greater detail by directly testing subjects' recognition of English genitive morphology (i.e., 's). This is especially important in ruling out a double object reading of a sentence such as: Mr. Tall is selling Mr. Short's photographs of himself. If the subject interprets Mr. Short's as Mr. Short, the resulting dative construction has an ambiguous coreference option. Knowledge of plural morphology could also be tested, since plural forms are more susceptible to this reading: Mr.Tall is selling Mr. Short [a] photograph of himself.

The Gender test could also be expanded to include reflexives. However, it is not clear that recognition of gender in English reflexives implies knowledge of the morphological complexity of these lexical elements. What is needed is a test that taps knowledge of the internal structure of XP reflexives. This would offer an independent check on L2 learners' knowledge of the morphological structure of English reflexives. Progovac and Connell (1991) addressed this problem in a pilot L2 acquisition study in which adjectives were inserted between the reflexive morphemes (eg., her usual self, her normal self). They argue this task forces morphological complexity which accounts

for local-only binding by subjects lacking AGR in their English grammars who consistently permitted long-distance binding of herself in parallel test sentences.

The Vocabulary task (12 items) was given to the L2 learner groups. Subjects were asked to translate English lexical items to Serbo-Croatian. The task examined subjects' knowledge of verbs that were used in the experimental tasks: hurt, show, think, know, believe, say, introduce, expect, force, pray, order, listen.

Subject performance on proficiency tests determined their inclusion in the final subject pool and proficiency grouping in the analysis. Subjects whose scores were below mean levels on more than one proficiency task were not included in further analyses. Mean scores for the final subject pool by age and proficiency group are shown below.

TABLE 3a: PROFICIENCY TEST MEAN SCORES FOR ENGLISH NATIVE SPEAKERS AND EXPERIMENTAL SUBJECTS BY AGE GROUP

P-TEST	Items	NS-ADOL	NS-ADULT	L2-ADOL	L2-ADULT
Cloze	29	25.4 SD 2.3	27.0 SD 1.6	13.8 SD 5.5	20.9 SD 5.2
Lexical	7	6.8 SD 0.4	6.9 SD 0.3	6.9 SD 0.4	6.9 SD 0.4
CPNP	4	3.8 SD 0.4	3.9 SD 0.4	3.8 SD 0.4	3.9 SD 0.2
Gender	3	3.0 SD 0.0	3.0 SD 0.2	3.0 SD 0.2	3.0 SD 0.2
Biclsal	4	2.9 SD 1.0	3.9 SD 0.6	2.3 SD 1.1	3.1 SD 1.0
Vocab	12	--	--	10.5 SD 1.2	11.6 SD 1.0

TABLE 3b: PROFICIENCY TEST MEAN SCORES FOR ENGLISH-SPEAKING CONTROLS AND EXPERIMENTAL SUBJECTS BY PROFICIENCY GROUP

P-TEST	Items	CON	LO	HI
Cloze	29	26.1 SD 2.1	12.8 SD 4.2	23.7 SD 2.4
Lexical	7	6.8 SD 0.4	6.9 SD 0.5	7.0 SD 0.0
CPNP	4	3.8 SD 0.4	3.9 SD 0.4	3.9 SD 0.3
Gender	3	3.0 SD 0.2	3.0 SD 0.2	3.0 SD 0.0
Biclausal	4	3.3 SD 0.9	2.5 SD 1.0	2.9 SD 1.3
Vocabulary	12	--	10.6 SD 1.3	11.6 SD 0.9

An additional screening procedure[7] was used to exclude subjects apparently using a non-syntactic strategy in selection of responses on the Multiple Choice Comprehension task. These control sentences included the following structures:

(6) a. During the football match, a friend of Peter hurt himself

b. A friend of Nina introduced herself to Mary.

In this case, use of a Minimal Distance Strategy to select the nearest NP would result in a c-command violation. To be included in the analysis, subjects had to produce a minimum of 3 correct responses on the 4 control sentences.

5.3.3.2. Sentence Types

The test sentences include biclausal sentences with reflexives present in tensed and infinitival embedded clauses and sentences with reflexives occurring in complex noun phrases (CPNPs). Table 5-4 summarizes the reflexive sentence types used in the two tasks. The complete set of test sentences included in the two experimental tasks is reported in Appendix 5-2.[8]

Type 1 sentences test Hypothesis B--transfer of the L1 X° anaphor type. Sentences with potential antecedents outside tensed clauses (Type 1A biclausal, and Type 1C) also test Hypothesis A, identifying the presence of +AGR in the grammars of these L2 learners. Type 1 sentences test for adoption of the L2 governing category, defined by the [NP,NP] Specifier that binds the English XP reflexive. If L2 learners have acquired the English XP reflexive, they should not permit antecedents outside the complex noun phrase. Type 1A sentences are monoclausal and biclausal structures with reflexives occuring in complex noun phrases in object position. Type 1B sentences have a subject control verb in the matrix clause of a biclausal structure, with the reflexive occurring in embedded CPNP object position. Binding of subject internal English reflexives in biclausal tensed sentences are tested in Type 1C. Both tasks include Type 1 sentences.[9]

Type 2 sentences test Hypothesis C which involves computation of binding domains for a transferred X° anaphor in a second language. Type 2 sentences are biclausal infinitival structures with either an Exceptional Case Marking verb (Type 2A) or an object control verb (Type 2B) in the matrix clause. If L2 learners recognize the morphological complexity of English reflexives, they should restrict antecedent choices to the clausal subjects of the embedded clauses. The [NP,IP] Specifier that binds the XP reflexive establishes the embedded clause as the governing category. If, on the other hand, the X° anaphor type has been transferred to the interlanguage grammar, the matrix subject will be permitted as an LD antecedent. Local antecedents are permissable in the grammars of L2 learners with misclassified X° reflexives, but LD antecedents are not. Type 2A sentences were tested on the Picture Identification task and Type 2B sentences on the Multiple Choice Comprehension task.

Type 3 sentences are biclausal tensed structures testing Hypothesis A which identifies the presence of the +AGR parameter setting in the interlanguage grammar. L2 learners who have adopted the correct English XP anaphor type will locally bind the reflexive since the [NP,IP] Specifier of the embedded clause closes the binding domain. However, L2 learners who have transferred the X° reflexive and have also adopted a -AGR parameter setting will

optionally permit matrix clausal subjects as antecedents. Type 3 sentences are included on both experimental tasks.

Two types of control sentences are included in the test materials. As described in the previous section, the Multiple Choice Comprehension task includes control sentences to determine whether subjects were applying a linear order strategy in their interpretations of reflexives. On the Picture Identification task, control sentences containing pronouns were used to determine whether subjects applied the same strategy in interpreting pronouns and reflexives. The pronoun sentence types correspond in structure to the ECM infinitival sentences and the tensed biclausal sentences, as follows:

(8) a. Little Cat wants [$_{IP}$Big Cat to lick him].

b. Mr. Short knows [$_{CP}$that [$_{IP}$Mr. Tall is looking at him in the mirror]].

The results of the pronoun sentences are reported in Section 5.4.1.4. Pronoun sentences were not used as a screening device.

TABLE 5-4: SENTENCE TYPES

Reflexive sentence types used in experimental tasks. Syntactic roles of possible antecedents and predicted English native speaker interpretations are indicated.

TYPE 1
Sentences with reflexives in complex noun phrases (CPNPs)

TYPE 1A
CPNPs in tensed clauses

Mr. Tall is selling [$_{NP}$Mr. Short's photographs of himself]
Mr. Short = Local NP
Mr. Tall = Long-distance NP
Predicted control interpretation: himself = Mr. Short

Michael says [$_{CP}$that [$_{IP}$Peter read [$_{NP}$John's letter about himself]]]
John = Local NP
Peter = Long-distance (clausemate) NP
Michael = Long-distance NP
Predicted control interpretation: himself = John

TYPE 1B
CPNPs in infinitival clauses (subject control verb)

John$_i$ wants [$_{IP}$PRO$_i$ to buy [$_{NP}$Michael's photographs of himself]]
Michael = Local NP
John = Long-distance NP (PRO = clausemate)
Predicted control interpretation: himself = Michael

TYPE IC
CPNPs in embedded subject position

Kristina thinks [$_{CP}$that [$_{IP}$[$_{NP}$Mary's opinion of herself] is wrong]]
Mary = Local NP
Kristina = Long-distance NP
Predicted control interpretation: herself = Mary

TYPE 2
Infinitival biclausal sentences

TYPE 2A
Sentences with Exceptional Case Marking verbs

Mr.Tall wants [$_{IP}$Mr. Short to look at himself in the mirror]
Mr. Short = Local NP
Mr. Tall = Long-distance NP
Predicted control interpretation: himself = Mr. Short

Table 5-4, continued

TYPE 2B
Sentences with object control verbs

Alex forced John$_i$ [$_{IP}$ PRO$_i$ to listen to himself]
John = Local NP (PRO)
Alex = Long-distance NP
Predicted control interpretation: himself = John

TYPE 3
Tensed biclausal sentences

Kristina says [$_{IP}$Vera talks about herself all the time]
Vera = Local NP
Kristina = Long-distance NP
Predicted control interpretation: herself = Vera

5.3.3.3. Picture Identification Task

The Picture Identification (PI) task consisted of 20 test items with 4 pictures to be judged for each sentence presented. Reflexive test sentences are among those listed in Table 5-4 . Subjects were presented with 3 tokens of each sentence type. These included biclausal sentences with reflexives occurring in tensed embedded clauses and infinitival complements of Exceptional Case Marking (ECM) verbs (Types 3 and 2A, respectively) and sentences with reflexives in noun phrases with lexical subjects (Type 1).

Control sentences with pronouns occurring in parallel biclausal tensed and infinitival structures were also included to provide an indirect check on the use of non-syntactic strategies in responding to test questions. It was assumed that subjects may have applied an identical linear strategy that led subjects to select the "nearest" NP in

responding to both pronoun and reflexive sentences. In this case, use of a Minimal Distance Strategy would result in correct responses on the reflexive sentences and incorrect responses on the pronoun sentences.

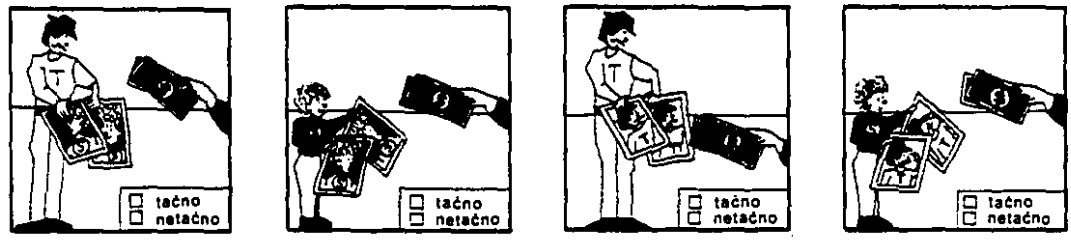
The test also included 5 distractor sentences with reflexives and pronouns in noun phrases. Two of the reflexive distractor sentences presented subjects with a subject/object antecedent choice to raise the level of potential multiple readings in the test materials, as shown in the following example:

(8) Mr. Tall showed Mr. Short a picture of himself.

Sentences in the PI task appeared in the format shown in Figure 5-3. In this example, the local NP antecedent is Mr. Short and the long-distance antecedent is Mr.Tall.

FIGURE 5-3: Picture Identification Task Test Item

Mr. Tall is selling Mr. Short's photographs of himself.



(a) **(b)** **(c)** **(d)**

Subjects were asked to judge each picture either correct(tačno) or incorrect (netačno). If picture (a) in the

above example is marked tačno, the subject has indicated the picture is a correct representation of the test sentence. In this case, the reflexive is interpreted as "Mr.Short," the local antecedent. Picture (c) illustrates the long-distance interpretation: himself = Mr. Tall. Pictures (b) and (d) were scored as ungrammatical. These pictures serve as distractors and reduce the percentage of possible correct guesses.[10]

5.3.3.4. Multiple Choice Comprehension Task

In the Multiple Choice Comprehension (MCC) task, subjects were asked to explicitly identify antecedents for reflexives. The MCC task included 20 test sentences containing reflexives. Of the sentence types shown in Table 4, the following were included in the MCC task: Type 1 sentences with reflexives in complex NPs (8 tokens), Type 2B (object control verb) sentences with reflexives in infinitivals (4 tokens), Type 3 sentences with reflexives in tensed embedded clauses (4 tokens). The MCC task also included the set of 4 Minimal Distance Strategy control sentences described in Section 5.3.3.1. Test items of the following form were presented to subjects:

(9) Nina wants to read Kristina's book about herself.

____a. Kristina
____b. Nina
____c. Kristina ili/or Nina

Sentences with subject control matrix verbs and infinitival embedded clauses containing reflexives in noun phrases with lexical subjects, such as (7), are ambiguous in Serbo-Croatian. For this reason, L2 learners were predicted to select (b) and (c) as well as (a) since these are all possible antecedent choices in the L1. Control subjects were expected to select (a).[11]

The use of potentially ambiguous (i.e., if English reflexives are misclassified as X^0 anaphors) English sentences in this task permits comparison with similar studies on L2 acquisition of reflexive binding (eg., Finer and Broselow 1986; Hirakawa 1990; Lee 1992; Thomas 1991b, 1993). Another alternative might be the use of sentences disambiguated on the basis of gender-marking. However, these might result in reliance on gender cues rather than syntactic binding to assign coreference.

Distinction between long-distance antecedents permits clarification of the type of binding pattern that has been adopted by the L2 learner. Responses on sentences containing long-distance antecedent candidates in both embedded and matrix clauses (Type 1A:biclausal) and sentences with possible LD antecedents occurring outside an embedded finite clause containing a reflexive (Type 1C, Type 3) provide information about the status of the AGR parameter setting. In Type 3, biclausal Type 1A, and Type 1C sentences, selection of the matrix subject involves crossing an

indicative finite clausal barrier. This type of coreference only occurs in languages like Chinese with a -AGR parameter setting and an X° reflexive. If the subject of the matrix clause is selected on these test items, this would indicate adoption of an AGR parameter setting not present either the native or target languages of L2 learners in this study. If instead, the subject of the embedded finite clause is identified as the only viable antecedent, transfer of the L1 anaphor type and +AGR is indicated.

5.3.4. Training Session

All subjects were given a training session immediately prior to the first (Picture Identification) experimental task. This training session was intended to heighten sensitivity to potential ambiguity in the test sentences and demonstrate the means for identifying such ambiguity. The possibility that test sentences might have more than one interpretation was emphasized. Subjects were reminded to judge each illustration separately since more than one picture would match a sentence with two interpretations.

The comprehension tasks contained sentences with constructions that are ambiguous in Serbo-Croatian. If L2 learner interpretations of English reflexives in the L1-ambiguous sentences (i.e., Type 1, and uninstantiated Type 2) permit both long-distance and local antecedents, transfer of the X° anaphor type is implied. Since ambiguous

sentences permit local as well as LD antecedents, subjects may not reveal the full range of potential antecedents permitted in their grammars by under-reporting ambiguity. Therefore, the training session was designed to raise the level of awareness of potential ambiguity so that subjects would be encouraged to identify all possible interpretations of reflexives (and pronouns) appearing in the test items.

In addition to obtaining a more complete representation of the L2 learners' interlanguage grammars, and reducing task difficulty through practice with the unfamiliar task format, the training session was intended to reduce preference bias in the data. Since sentence comprehension tasks, particularly MCC tasks, yield preferences, the range of antecedent options in the L2 learner's grammar may be under-represented. While preference data do not provide the most complete picture of the binding properties of the interlanguage grammar, tasks which produce preference results are consistent with the underlying grammar. The Picture Identification task format potentially produces a more complete picture of L2 learners' underlying knowledge of reflexive binding. In the PI task, each of 4 pictures must be individually judged and marked. However, this task also may reveal preferences since there is nothing to prevent a subject from selecting one picture as the accurate representation of the test sentence and rejecting the rest without considering them. For this reason, it is important

to raise the level of sensitivity to potential ambiguity on the PI task.

Preference bias in L2 binding studies has been discussed by Hirakawa (1989, 1990), Lakshmanan and Teranishi (1992), Lee (1992), and Thomas (1989, 1991a,b,c, 1993b). Low levels of ambiguity detection are frequently cited in this research. When subjects are offered a range of antecedent choices, they may fail to indicate all potential antecedents.

Factors that may contribute to low levels of responses reflecting multiple readings include failure to detect ambiguity, avoidance of ambiguity, or a strong preference for a particular antecedent. In addition, lack of ambiguous responses may be related to task type and difficulty. When faced with a difficult task, subjects may settle for a single response when an acceptable antecendent has been identified. Increasing familiarity with the task format through practice was intended to help reduce task difficulty.

5.3.5. Scoring and Analyses

Aggregate frequency data for the PI task is reported in Table 5-5 by age group and Table 5-6 by proficiency group. PI task data on pronoun sentences is presented by age and proficiency groups in Tables 5-7 and 5-8. MCC task aggregate frequency data for age groups is shown in Table 5-9 and proficiency data in Table 5-10. Individual subject data for the experimental tasks is reported in Tables 5-11 - 5-14.

PI task subject data is shown in Table 5-11 by age group and in Table 5-12 by proficiency group. Age group data on the MCC task is reported in Table 5-13, and proficiency group data in Table 5-14.

On the frequency tables, local antecedents (NP1) are correct responses on the reflexive sentences. Long-distance antecedents (NP2, NP3, NP1/2, and so on) are incorrect responses on these sentences. Individual error scores were computed on the basis of non-local responses, including ambiguous reference. Responses that show ungrammatical interpretation of the test sentence, odd responses, and non-responses fall into the category "Other" on the PI task. The frequencies for odd response and non-response are negligible. ANOVAs and post hoc Scheffé procedures were applied to error scores.

5.4. Results

Tables 5-5 - 5-10 report the proportion of responses for each group that show coreference between the reflexive (or pronoun) and possible antecedent NPs. Tables 5-11 - 5-14 report the proportion of individual subjects exhibiting consistent response behavior. Subjects showing inconsistent response behavior are not reported; therefore, proportions may sum to less than 1.000 (i.e., less than 100%).

Subject groups are identified as follows:

NS-ADOL (n=25) = English native speaker adolescent control group

NS-A (n=22) = English native speaker adult control group

L2-ADOL (n=39) = Adolescent L2 learner group

L2-A (n=34) = Adult L2 learner group

CON (n=47) = English native speaker control group

L2-LO (n=44) = Low proficiency L2 learner group

L2-HI (n=29) = High proficiency L2 learner group.

5.4.1. Results of the Picture Identification Task

Aggregate results for the Picture Identification task are reported in Tables 5-5 and 5-6. Table 5-5 presents frequency data by age group, and Table 5-6 presents this data by proficiency level. Aggregate frequency data on pronoun control sentences are presented in Tables 5-7 (age) and 5-8 (proficiency). The percentages for different groups are based on raw scores representing responses indicating specific NP antecedents. For the reflexive sentences, NP1 is the predicted choice for English native speaker controls. NP2 is a long-distance antecedent and NP1/2 indicates ambiguous coreference. For the pronoun sentences, the non-local antecedent (NP2) is the predicted control choice. Choices permitting a local antecedent (NP1 or NP1/2) for a pronoun violate Principle B of the Binding Theory.

5.4.1.1. Type 1: CPNP Sentences

Hypotheses A and B predict significant differences between control and L2 learner response behavior in interpretations of (Type 1) sentences with reflexives in complex noun phrases. For Type 1 sentences, NP1 is the subject of the noun phrase and NP2 is the clausal subject. NP1 is the local antecedent and NP2 is the long-distance antecedent. Long-distance binding is possible in sentences of this type in Serbo-Croatian.

TABLE 5-5:
Results of Picture Identification Task: AGE GROUPS

Proportion of responses showing coreference between a reflexive and an indicated NP on the Picture Identification task, by sentence type, for adolescent and adult groups of L2 learners and adolescent and adult native speaker control groups.

	NS-ADOL	NS-A	L2-ADOL	L2-A
n =	25	22	39	34
TYPE 1:				
Mr. Tall is selling Mr. Short's photographs of himself.				
NP1(Local)	0.787	0.879	0.607	0.667
NP2(Long-distance)	0.080	0.091	0.282	0.235
NP1/2	0.067	0.030	0.017	0.049
Other	0.067	0.000	0.094	0.049
TYPE 2A:				
Mr. Short expects Mr. Tall to shoot himself.				
NP1(L)	0.933	0.924	0.803	0.882
NP2 (LD)	0.027	0.000	0.051	0.049
NP1/2	0.013	0.000	0.000	0.000
Other	0.027	0.076	0.145	0.069
TYPE 3:				
Mr. Short thinks that Mr. Tall can tickle himself.				
NP1(L)	0.880	0.909	0.829	0.892
NP2(LD)	0.080	0.061	0.034	0.029
NP1/2	0.013	0.015	0.009	0.029
Other	0.027	0.015	0.128	0.049

For Type 1 test items, L2 learners chose the local NP1 antecedent in 60% and 67% of their responses. This compares with 79% and 88% for the native speaker control groups. Adolescent L2 learners selected pictures illustrating coreference with the non-local clausal subject in 30% of their responses, compared with only 15% for the adolescent controls and 12% for the adult controls. Adult L2 learners also LD bound the reflexive at a much higher rate (28%) than the control group. There are significant differences between control and L2 learner response behavior on Type 1 (CPNP) sentences. The results of an analysis of variance(ANOVA) ($F(3,116) = 3.018$, $p=.033$) shows a significant group effect, though post hoc Scheffé procedures do not pinpoint these differences.

Results on proficiency group data provide an interesting comparison. Table 5-6 shows that the pooled control group long-distance bound the reflexive in 14% of the cases while the HI proficiency group (31%) and LO proficiency group (28%) produce a pattern of responses similar to that shown in Table 5-5. The ANOVA again displays significant group effects ($F(2,117) = 4.595$, $p=.012$) with post hoc Scheffé procedures ($p < .05$) showing group differences between both LO and HI groups and the control group. Results on Type 1 sentences for both age and proficiency factor support Hypothesis A and B. The results on Type 2A and Type 3 items reveal a very different pattern.

TABLE 5-6:
Results of Picture Identification Task: PROFICIENCY GROUPS

Proportion of responses showing coreference between a reflexive and an indicated NP on the Picture Identification task, by sentence type, for low and high proficiency groups of L2 learners and native speaker controls.

	CON	L2-LO	L2-HI
n =	47	44	29
TYPE 1:			
Mr. Tall is selling Mr. Short's photographs of himself.			
NP1 (Local)	0.830	0.614	0.667
NP2 (Long-distance)	0.085	0.250	0.276
NP1/2	0.050	0.030	0.034
Other	0.035	0.106	0.023
TYPE 2A:			
Mr. Short expects Mr. Tall to shoot himself.			
NP1 (L)	0.929	0.773	0.943
NP2 (LD)	0.014	0.061	0.034
NP1/2	0.007	0.000	0.000
Other	0.050	0.167	0.023
TYPE 3:			
Mr. Short thinks that Mr. Tall can tickle himself.			
NP1 (L)	0.894	0.803	0.943
NP2 (LD)	0.071	0.038	0.023
NP1/2	0.014	0.023	0.011
Other	0.021	0.136	0.023

5.4.1.2. Type 2A: ECM Infinitival Biclausal Sentences

As shown in Table 5-5, Type 2A sentences are infinitival biclausal sentences with an Exceptional Case Marking (ECM) verb in the matrix clause.[12] The adult and adolescent control group locally bound the reflexive at a rate of 93%. Local binding for the L2 adolescent group was 80% while the L2 adults approached the control pattern with 88%. However, the level of LD binding is nearly the same for L2 learners and controls. The LD responses (i.e. LD error

scores) were much more similar across all groups: NS-Adol 4%, NS-A 0%, L2-Adol 5%, L2-A 5%.

The same response pattern occurs in the proficiency group data, as shown in Table 5-6. Here the HI proficency group (94%) matches the control group (93%) in percent of responses indicating local binding, with the LO group down to 77% due primarily to a high (16%) Other score. Response levels for long-distance antecedents remained close for the proficiency groups. Responses on Type 2A sentences show no significant group effect for age (ANOVA, $F(3,116) = 0.932$, $p=.428$) or proficiency (ANOVA, $F(2,117) = 1.178$, $p=.312$). This result fails to support Hypothesis C.

The pattern of responses on Type 2A sentences is apparently due to task difficulty (LO group Other responses were 17%). With respect to LD binding, L2 learners behave like the English controls. Local binding on Type 2A (ECM) sentences appears to be due to the presence of a lexical subject in the embedded clause. In ECM infinitival sentences, the subject of the embedded clause is assigned Case by the matrix verb and is θ-marked by the embedded verb. ECM sentences have a lexical subject in the embedded clause and for this reason must be considered apart from infinitival sentences with an object controlled PRO subject in the embedded clause. This contrast is considered in more detail in the discussion section.

5.4.1.3. Type 3: Tensed Biclausal Sentences

All groups show low levels of LD binding on Type 3 finite biclausal sentences. These results show that subjects predominantly bound reflexives to the local clausal subject of the embedded finite clause, rejecting LD binding across AGR. There is no significant group effect on Type 3 sentences for the age factor: (ANOVA, $F(3,116)= 0.532$, $p=.661$) or the proficiency factor: (ANOVA, $F(2,117)= 0.873$, $p=.42$). This result indicates the +AGR parameter setting is in place. Chinese-type, -AGR languages, would produce an LD binding pattern of interpretation.

5.4.1.4. Pronoun Sentences

The control structures tested in the PI task served as means of determining whether subjects may have applied a Minimal Distance Strategy in selecting antecedents. Use of pronoun control sentences assumes subjects who apply non-syntactic strategies in assigning antecedents for pronouns will resort to the same type of strategy in their interpretations of other referentially dependent elements, including reflexives.

Two types of parallel structures containing pronouns were included in the PI task: ECM infinitival and tensed biclausal sentences. As shown on Tables 5-7 and 5-8, all subjects rejected local NPs as antecedents for pronouns. This indicates L2 learners as well as control subjects were

not relying on a Minimal Distance Strategy in interpreting pronoun sentences. Indirectly, the results on these sentences provide information about the way in which subjects in this study established coreference between NPs and antecedents and suggest a Minimal Distance Strategy did not guide them in their interpretations of reflexives as well as pronouns.

Results on the ECM structures suggest that low proficiency and adolescent subjects were less successful in determining the correct picture that represented the non-local interpretation of the test sentence. Decreased levels of correct responses on ECM sentences (L2-ADOL: 82%; L2-LO: 80%) were not accompanied by increases in the levels of local responses (violations of Principle B), but rather increases in Other scores (L2-ADOL: 14.5%; L2-LO: 15%). This pattern supports the notion that these subjects experienced greater difficulty in assigning coreference when a lexical subject was present in the infinitival clause.

Overall, response behavior on the pronoun control sentences supports the results of the lexical proficiency test which showed that L2 learners in this study were able to distinguish reflexives from pronouns, and indicates that these L2 learners rely on their grammar rather than on a linear order strategy in choosing antecedents for referential elements.

TABLE 5-7:
Results of PI Task Pronoun Control Sentences: AGE GROUPS

Proportion of responses showing coreference between a pronoun and an indicated NP on the Picture Identification task, by sentence type, for adolescent and adult groups of L2 learners and native speaker control groups.

	NS-ADOL	NS-A	L2-ADOL	L2-A
n =	25	22	39	34
PRONOUN TYPE 2A:				
Mr. Tall expects Mr. Short to point at him.				
NP1 (Local)	0.040	0.045	0.034	0.010
NP2 (Non-Local)	0.907	0.955	0.821	0.892
NP1/2	0.027	0.000	0.000	0.020
Other	0.027	0.000	0.145	0.078
PRONOUN TYPE 3:				
Mr. Tall thinks that Mr. Short is going to shoot him.				
NP1 (Local)	0.040	0.015	0.026	0.029
NP2 (Non-local)	0.893	0.939	0.880	0.912
NP1/2	0.027	0.015	0.017	0.010
Other	0.040	0.030	0.077	0.049

TABLE 5-8:
Results of Picture Identification Task Pronoun Control Sentences: PROFICIENCY GROUPS

Proportion of responses showing coreference between a pronoun and an indicated NP on the Picture Identification task, by sentence type, for low and high proficiency groups of L2 learners and native speaker controls.

	CON	L2-LO	L2-HI
n =	47	44	29
PRONOUN TYPE 2A:			
Mr. Tall expects Mr. Short to point at him.			
NP1 (Local)	0.043	0.030	0.011
NP2 (Non-Local)	0.929	0.803	0.931
NP1/2	0.014	0.015	0.000
Other	0.014	0.152	0.057
PRONOUN TYPE 3:			
Mr. Tall thinks that Mr. Short is going to shoot him.			
NP1 (Local)	0.028	0.038	0.011
NP2 (Non-local)	0.915	0.848	0.966
NP1/2	0.021	0.023	0.000
Other	0.035	0.091	0.023

5.4.2. Results of the Multiple Choice Comprehension Task

Aggregate results of the Multiple Choice Comprehension (MCC) task are reported on Tables 5-9 and 5-10. For each sentence type (or subtype), the frequency data represent the proportion of each group's responses that confirm coreference between the reflexive and specific NP antecedent(s). Table 5-9 displays the frequency data by age group and Table 5-10 reports frequency data by proficiency group. All sentences on the MCC task contain reflexives. The local antecedent (NP1) is the predicted choice for English native speaker controls. NP2 is a long-distance antecedent and NP1/2 indicates ambiguous coreference.

Because this type of sentence comprehension task does not require subjects to rule out ungrammatical interpretations, there is a greater potential for under-representation of multiple readings and/or preference effects in the MCC task as compared to the PI task. While in the PI task, subjects judged the correctness of each of four pictures representing a possible interpretation of the test sentence, in the MCC task, subjects are asked to identify the antecedent(s) for the reflexive in the test sentence (see eg.(9)). The question of the role of preference in tasks designed to reveal underlying knowledge of reflexives will be further discussed in the discussion section that follows.

TABLE 5-9:
Results of Multiple Choice Comprehension Task: AGE GROUPS

Proportion of responses showing coreference between a reflexive and an indicated NP on the Multiple Choice Comprehension task, by sentence type, for adolescent and adult groups of L2 learners and adolescent and adult native speaker control groups.

	NS-ADOL	NS-A	L2-ADOL	L2-A
n =	25	22	39	34
TYPE 1: (Combined results: Object position CPNP sentences)				
NP1 (Local)	0.820	0.856	0.568	0.657
NP2 (Long-distance)	0.060	0.076	0.231	0.127
NP1/2	0.080	0.045	0.137	0.167
Other	0.040	0.023	0.064	0.049
TYPE 1A/Monoclausal:				
Bobby likes Peter's song about himself.				
NP1 (L)	0.900	0.932	0.628	0.691
NP2 (LD-Clausemate)	0.040	0.045	0.231	0.088
NP1/2	0.060	0.023	0.141	0.221
Other	0.000	0.000	0.000	0.000
TYPE 1A/Biclausal:				
Michael says that Peter read John's letter about himself.				
NP1 (L)	0.760	0.886	0.474	0.632
NP2 (LD-Clausemate)	0.040	0.023	0.205	0.088
NP3 (LD)	0.060	0.023	0.064	0.044
NP1/2	0.080	0.023	0.154	0.132
NP1/3	0.040	0.000	0.026	0.044
NP2/3	0.000	0.000	0.026	0.000
NP1/2/3	0.020	0.045	0.026	0.044
Other	0.000	0.000	0.026	0.015
TYPE 1B:				
Nina wants to read Kristina's book about herself.				
NP1 (L)	0.800	0.750	0.603	0.647
NP2 (LD/CM-PRO)	0.100	0.159	0.256	0.206
NP1/2	0.100	0.091	0.115	0.147
Other	0.000	0.000	0.026	0.000
TYPE 1C:				
Alex thinks that Michael's film about himself will win a prize.				
NP1	0.900	0.977	0.769	0.897
NP2	0.020	0.023	0.128	0.074
NP1/2	0.080	0.000	0.103	0.029
Other	0.000	0.000	0.000	0.000

Table 5-9, continued

TYPE 2B:				
Alex forced John to listen to himself.				
NP1 (Local-PRO)	0.850	0.989	0.712	0.868
NP2 (LD)	0.060	0.011	0.173	0.074
NP1/2	0.090	0.000	0.096	0.059
Other	0.000	0.000	0.019	0.000
TYPE 3:				
Kristina says Vera talks about herself all the time.				
NP1 (L)	0.970	1.000	0.910	0.978
NP2 (LD)	0.020	0.000	0.045	0.015
NP1/2	0.010	0.000	0.045	0.007
Other	0.000	0.000	0.000	0.000

5.4.2.1. Type 1: CPNP Sentences

The results on Type 1 (CPNP) sentences indicate that L2 learners in this study bind reflexives across lexical subjects of noun phrases ([NP,NP]). However, the results for Type 1 sentences reveal differences that occur when the CPNP containing the reflexive is in object position (Type 1A, Type 1B), as opposed to embedded subject position (Type 1C).

As shown on Tables 5-9 and 5-10, L2 learners exhibit high rates of long-distance binding on the Type 1 sentences with CPNPs in object position. Across all three subtypes of object position CPNP sentences (Type 1A/monoclausal, Type 1A/biclausal, Type 1B), the ANOVA shows highly significant differences between the mean error scores of the 4 age groups: ($F(3,116) = 6.222$, $p=.001$). Post hoc Scheffé procedures ($p < .05$) show significant differences between the adolescent L2 learner group and the adult and adolescent control groups. The adult controls locally bound the

reflexive 86% of the time, and the adolescent controls 82%. L2 learner groups were far less likely to select the local antecedent: 57%(L2-ADOL) and 66%(L2-A). Long-distance antecedents were selected in 42%(L2-ADOL) and 34%(L2-A) of the L2 learner responses. The occurrence of ambiguous NP1/2 responses is also much higher for the experimental groups for Type 1 sentences. This reflects the X^0/+AGR binding configuration; similar structures in Serbo-Croatian are ambiguous (Bennett 1991), as discussed in Chapter 2, Section 2.4.2. Hypotheses A and B are supported by the results on Type 1 sentences with reflexives in CPNPs in object position.

The results for proficiency groups for Type 1 sentences with reflexives in complex noun phrases in object position also show highly significant group differences: ANOVA, $F(2,117) = 8.625$, $p < .001$, with post hoc Scheffé procedures ($p < .05$) showing group differences between the L2 learner groups and the control group, but no significant difference between the L2 proficiency groups. Selection of an LD antecedent is reported in 37% of the cases for the L2-LO group, 40% for the L2-HI group, and 16% for the control group. Again, these results support Hypothesis A and Hypothesis B.

Type 1A: Tensed CPNP Sentences (Object Position)

In a breakdown of the object position CPNP category, we find some differences in strength of LD response levels. Responses on monoclausal Type 1A sentences show significant differences between experimental and control age groups (ANOVA, $F(3,116) = 5.658$, $p=.001$). This is supported by post hoc Scheffé procedures ($p < .05$) which show group differences between the adolescent learner group and both control groups. On monoclausal CPNP sentences, subjects selected local antecedents at a rate of 90% (NS-ADOL) and 93% (NS-A) as compared with 63% (L2-ADOL) and 69% (L2-A). NP1/2 responses reflecting multiple interpretations of the reflexive range from 22% for the adolescent L2 group down to 2% for the adult controls.

TABLE 5-10:
Results of Multiple Choice Comprehension Task:
PROFICIENCY GROUPS

Proportion of responses showing coreference between a reflexive and an indicated NP on the Multiple Choice Comprehension task, by sentence type, for low and high proficiency groups of L2 learners and native speaker controls.

	CON	L2-LO	L2-HI
n =	47	44	29
TYPE 1: (Combined results: Object position CPNP sentences)			
NP1 (Local)	0.837	0.614	0.603
NP2 (Long-distance)	0.067	0.216	0.132
NP1/2	0.064	0.106	0.218
Other	0.032	0.064	0.046
TYPE 1A/Monoclausal:			
Bobby likes Peter's song about himself.			
NP1 (L)	0.915	0.659	0.655
NP2 (LD-Clausemate)	0.043	0.216	0.086
NP1/2	0.043	0.125	0.259
Other	0.000	0.000	0.000
TYPE 1A/Biclausal:			
Michael says that Peter read John's letter about himself.			
NP1 (L)	0.819	0.511	0.603
NP2 (LD-Clausemate)	0.032	0.205	0.069
NP3 (LD)	0.043	0.080	0.017
NP1/2	0.053	0.114	0.190
NP1/3	0.021	0.011	0.069
NP2/3	0.000	0.023	0.000
NP1/2/3	0.032	0.023	0.052
Other	0.000	0.034	0.000
TYPE 1B:			
Nina wants to read Kristina's book about herself.			
NP1 (L)	0.777	0.670	0.552
NP2 (LD/CM-PRO)	0.128	0.227	0.241
NP1/2	0.096	0.080	0.207
Other	0.000	0.023	0.000
TYPE 1C:			
Alex thinks that Michael's film about himself will win a prize.			
NP1	0.900	0.977	0.769
NP2	0.020	0.023	0.128
NP1/2	0.080	0.000	0.103
Other	0.000	0.000	0.000

Table 5-10, continued

TYPE 2B:			
Alex forced John to listen to himself.			
NP1 (L-PRO)	0.936	0.795	0.879
NP2 (LD)	0.021	0.148	0.034
NP1/2	0.043	0.057	0.086
Other	0.000	0.000	0.000
TYPE 3:			
Kristina says Vera talks about herself all the time.			
NP1 (L)	0.984	0.920	0.974
NP2 (LD)	0.011	0.051	0.000
NP1/2	0.005	0.028	0.026
Other	0.000	0.000	0.000

The proficency group response pattern shows a remarkable similarity between the behavior of LO and HI L2 learner groups: LD binding differs less than 1% for these groups. The L2 learner groups selected LD antecedents 34% (L2-LO) and 35% (L2-HI) by contrast to the control group (9%). The ANOVA ($F(2,117) = 8.148$, $p < .001$) is highly significant; post hoc Scheffé procedures ($p < .05$) that show both learner groups differ from the control group in their interpretations of monoclausal sentences with reflexives in complex NPs. Interestingly, the L2-HI group most frequently reports ambiguity in interpreting reflexives in monoclausal CPNP sentences (26%). The L2-LO group selected an ambiguous response (NP1/2) 13% of the time and the controls chose this response in only 4% of the cases.

The binding pattern for the experimental groups on tensed biclausal Type 1A sentences is similar to the monoclausal pattern. There are highly significant differences between age groups (ANOVA, $F(3,116) = 6.662$,

p <.001), with post hoc Scheffé procedures (p <.05) again showing significant differences between the adolescent learner group and both control groups. Local binding for the adolescent and adult groups shows a similar pattern: NS-ADOL (76%) and NS-A (89%) as compared with L2-ADOL (47%) and L2-A (63%). The test groups response patterns for antecedents outside the finite embedded clause were similar to that of the adolescent native speaker control group. The adult controls made fewer errors of this type.

The proficiency group results on Type 1A tensed biclausal sentences also show a decrease in local antecedent responses, perhaps due to differences in the number of potential antecedents presented. Biclausal tensed CPNP sentences present 7 possible antecedent choices. Monoclausal sentences offer only 3 choices. As a result, data on this sentence type may be noisier. Local binding by control subjects is weaker, only 82%, but this compares with 51% (L2-LO) and 60% (L2-HI) for the experimental groups. Again, the L2-LO group favored the clausemate LD antecedent (21%) while the L2-HI group favored the ambiguous NP1/2 response (19%). The ANOVA ($F(2,117) = 7.583$, $p=.001$) shows signficant differences between the mean error scores for the control and L2 learner proficiency groups. Both learner groups differ from the control group in post hoc Scheffé procedures (p <.05).

Combined results on Type 1A tensed CPNP sentences are significant for both age groups and proficiency groups. There are highly significant differences for age factor: ANOVA, $F(3,116) = 8.543$, $p < .001$, with post hoc Scheffé ($p < .05$) procedures showing differences between the adolescent L2 group and both control groups and between the adult L2 group and the adult control group. The proficiency group results are also highly significant (ANOVA, $F(2,117) = 11.033$, $p < .001$). Group differences are revealed by post hoc Scheffé procedures ($p < .05$) for both learner groups vs. the control group. Results on the tensed CPNP sentences indicate Serbo-Croatian speakers learning English have not acquired the English binding pattern. These results support Hypothesis A and Hypothesis B.

Type 1B: Subject Control Infinitival Biclausal Sentences

Type 1B sentences are CPNP sentences with infinitival embedded clauses with a subject control verb in the matrix clause. L2 learners permitted LD binding in 37%(L2-ADOL) and 35%(L2-A) of their responses as compared to 20% for the adult English native speaker control group and 25% for the adolescent controls. LD binding on Type 1B sentences involves coreference between the null subject of the embedded finite clause (subject controlled PRO) and the reflexive. In this sense, it is interesting to note that while the L2 learners show the same pattern of response on

Type 1A monoclausal sentences and Type 1B biclausal sentences, the English controls permit a higher level of LD binding on Type 1B (NS-Adol: 20%; NS-A: 25%; CON: 22%) sentences involving a clausemate LD antecedent than on Type 1A monoclausal sentences that also have a potential clausemate LD antecedent (NS-Adol: 10%; NS-A: 9%; CON: 9%).

Although the L2 learners LD bind at a distinctly higher rate, the resulting differences in mean error scores do not show significant group effect (ANOVA ($F(3,116) = 1.433$, $p=.237$). The LD binding pattern on the proficiency groups shows a much higher acceptance of LD binding by the high proficiency learner group: CON (22%), L2-HI (45%), L2-LO (31%). Significant group effects are indicated by the ANOVA ($F(2,117) = 3.383$, $p=.037$) and in post hoc Scheffé procedures ($p < .05$) which show differences between the HI learner group and the control group.

Type 1C: CPNP Sentences (Subject Position)

The results on Type 1C sentences are somewhat problematic since LD binding in test sentences with CPNPs in embedded subject position involves binding across a finite clausal barrier as well as a subject NP. There are significant group differences on Type 1C sentences (ANOVA, $F(3,116) = 3.566$, $p=.016$) by age group. Post hoc Sheffé procedures ($p < .05$) show significant group differences between the adolescent L2 learner group and the adult

control group. The frequency data (see Table 5-9) reveals that the adolescent L2 learners LD bind the reflexive in 23% of their responses. The response behavior of the adult L2 learner group is comparable to that of the control groups. Both the adult L2 learners and the adolescent native speakers locally bind the reflexive in 90% of their responses. The adult controls are even more restrictive (i.e. 98% local antecedents).

The same pattern is shown in the proficiency group results. There are significant differences in mean error scores for proficiency groups (ANOVA, $F(2,117) = 3.398$, $p=.037$), with post hoc Sheffé procedures showing significant differences between the low proficiency group and control group means. The low proficiency group permitted LD binding outside the tensed clause in 23% of the reponses, while the high proficiency group selected local antecedents in 98% of their responses. It is clear that LD responses are only produced by the less advanced L2 learners for this structure.

Although this pattern of response suggests that the less proficient L2 learners might have a -AGR parameter setting which permits LD binding outside tensed clauses, the strength of the results on Type 1A/biclausal and Type 3 sentences on both tasks makes this conclusion unlikely. It appears that though binding a X^0 reflexive in a complex NP in embedded subject position is not allowed in Serbo-Croatian

(see Chapter 2, Section 2.4.4.), some other factor has over-ridden the grammar of these learners. Berent and Samar (1990:726) suggest that "pragmatic or semantic factors" may be triggered by certain structures. Alternatively, subject internal reflexive constructions may have syntactic properties that differ from predicate CPNP structures in ways that make them more difficult for less proficienct L2 learners to handle. While there is no easy explanation for LD binding outside tensed clauses in Type 1C sentences, it is a result that raises questions about the use of non-syntactic strategies for antecedent selection by low proficiency L2 learners.[13]

5.4.2.2. Type 2B: Object Control Infinitival Biclausal Sentences

Responses by age group on Type 2B object control sentences show significant group differences (ANOVA, $F(3,116) = 7.198$, $p < .001$). Type 2B sentences on the MCC task are infinitival biclausal sentences with an object control verb in the matrix clause. Object control structures are crucial to investigation of LD binding across [NP,IP] SUBJECTs in infinitival clauses. In these structures, the PRO subject of the embedded clause is object-controlled and the matrix subject is also a potential antecedent if the learner assumes X^{o}/+AGR. Because similar structures do not occur in Serbo-Croatian, the results from this category support Hypothesis C. That is, L2 learners are able to

compute binding domains in a second language.

There appears to be a developmental change reflected in Type 2B responses. Although the adult learner group selected local antecedents at a rate (87%) within the control group range (NS-A:99%; NS-ADOL:85%), adolescent test subjects locally bound the reflexive only 71% of the time. Post hoc Scheffé procedures ($p < .05$) reveal significant differences between the adolescent learner group and the adult control group. This is supported by data on local binding by subjects in proficiency groups: CON (92%), L2-HI (91%), L2-LO (71%). The ANOVA ($F(2,117) = 11.206$, $p < .001$) provides further indication of group differences; post hoc Scheffé procedures ($p < .05$) reveal significant differences between the LO group and HI test groups as well as between the LO group and the controls.

5.4.2.3. Type 3: Tensed Biclausal Sentences

All groups show low levels of LD binding on Type 3 sentences, supporting Hypothesis A. Controls locally bound the reflexive within the finite clause 97% (NS-ADOL) and 100% (NS-A) of the time, the L2 adolescent group at 91%, and the L2 adult group at 98%. Despite this slim percentage difference, significant group effects are shown on the ANOVA, $F(3,116) = 5.480$, $p=.001$. Post hoc Scheffé ($p < .05$) procedures show group differences between the L2 adolescent group and the adult control group and between the two

learner groups.

Proficiency group local binding of reflexives in tensed biclausal sentences shows a similar pattern of results: CON (98%), L2-HI (97%), and L2-LO (92%). The ANOVA ($F(2,117) = 5.571$, $p=.005$) again shows significant group effect, with post hoc Scheffé procedures ($p < .05$) showing differences between the LO group and the controls. There are no significant group differences between the LO and HI groups.[14]

Most importantly, the results clearly show that all groups restrict the binding domain to the finite clause, the binding pattern associated with languages with morphological AGR. Both test subjects and controls bound reflexives to the local clausal subject of the embedded finite clause, rejecting LD binding across AGR. This result indicates the +AGR parameter setting is established in the grammars of these learners. This conclusion is supported by results on the PI task which also indicate these L2 learners have the +AGR parameter setting.

5.4.3. Individual Results

In order to investigate the variability of the grammars of the L2 learners, strength of consistent response for individual subjects was examined. Tables 5-11 - 5-14 report frequency dataas the proportion of group members who consistently select a particular NP antecedent.

These results help establish the presence of the correct English local-only binding pattern in interlanguage grammars of individual L2 learners. However, in languages with the LD/local binding option (i.e., an X° reflexive), an inconsistent pattern may be the norm. (nb: Inconsistent response behavior is not reported; thus, proportions may sum to less than 1.000.)

Individual subject data in age and proficiency groups support the results of the aggregate analysis on both sentence comprehension tasks. L2 learners fail to bind reflexives to local antecedents in the binding domain for XP reflexives, implying transfer of the X° reflexive from the L1 to the interlanguage grammar.

Subject results on the PI task are reported on Tables 5-11 and 5-12. Consistency of response on the PI task is defined as ≥67% of the possible responses on a particular sentence type, the level applied in analysis of reflexive-antecedent data obained in an MCC task by Thomas (1991a,b). As reported in Table 5-11, control subjects consistently select local antecedents for reflexive in Type 1 sentences, though adolescent native speaker controls are less consistent (84% consistently local) in their selection of local antecedents than adult controls (95.5% consistently local). By contrast, percent of L2 learner subjects who show consistent local binding hovers around 67%, with consistent LD binding to the long-distance NP antecedent exhibited by

20.5% of the adolescent L2 learners and 18% of the adult L2 learners.

The results on Type 2A ECM infinitival sentences support the aggregrate results. As discussed with regard to group results on the reflexive (and pronoun) ECM sentences, the failure of adolescent L2 learners to locally bind the reflexive does not indicate they have selected an LD antecedent. Ten percent of the subjects in the L2-ADOL group consistently choose a picture which represented neither the local nor the long-distance interpretation of the reflexive. This may reflect a task effect.

Subject data on Type 3 sentences supports the group results. Here we find that 88% or more of the test subjects consistently bind the reflexive in a tensed biclausal structure to the local clausal subject antecedent in the embedded clause. This indicates the +AGR parameter value is present in the interlanguage grammars of these L2 learners.

TABLE 5-11:
Results of Picture Identification Task:
CONSISTENT INTERPRETATION BY SUBJECTS IN AGE GROUPS

Proportion of group members with consistent responses (≥67%) showing coreference between a reflexive and an indicated NP, by sentence type, for adolescent and adult groups of L2 learners and adolescent and adult native speaker control groups.

	NS-ADOL	NS-A	L2-ADOL	L2-A
n =	25	22	39	34
TYPE 1:				
Mr. Tall is selling Mr. Short's photographs of himself.				
NP1(Local)	0.840	0.955	0.667	0.677
NP2(Long-distance)	0.040	0.000	0.205	0.176
NP1/2	0.080	0.046	0.000	0.029
Other	0.040	0.000	0.051	0.000
TYPE 2A:				
Mr. Short expects Mr. Tall to shoot himself.				
NP1(L)	1.000	1.000	0.821	0.941
NP2 (LD)	0.000	0.000	0.026	0.029
NP1/2	0.000	0.000	0.000	0.000
Other	0.000	0.000	0.103	0.000
TYPE 3:				
Mr. Short thinks that Mr. Tall can tickle himself.				
NP1(L)	1.000	0.955	0.872	0.971
NP2(LD)	0.000	0.046	0.026	0.029
NP1/2	0.000	0.000	0.000	0.000
Other	0.000	0.000	0.077	0.000

Subject data by proficiency group on the PI task shows that 64% of the subjects in the low proficiency group and 72% in the high proficiency group consistency select local antecedents for reflexives in Type 1 (CPNP) sentences. This compares to 89% of the control subjects. LD binding is consistently permitted by 18% of the low proficiency L2 learners and 24% of the high proficiency L2 learners. This indicates that the underlying knowledge of reflexives of

these L2 learners does not conform to that of native speakers of the L2 target language and shows evidence of transfer of the L1 anaphor type.

The subject results on Type 2A and Type 3 sentences by proficiency group reveal consistent local binding by most L2 learners and a distinct lack (<4%) of consistent LD binding on these sentence types.

TABLE 5-12:
Results of Picture Identification Task:
CONSISTENT INTERPRETATION BY SUBJECTS IN PROFICIENCY GROUPS

Proportion of group members with consistent responses (≥67%) showing coreference between a reflexive and an indicated NP, by sentence type, for low and high proficiency groups of L2 learners and native speaker controls.

	CON	L2-LO	L2-HI
n =	47	44	29
TYPE 1:			
Mr. Tall is selling Mr. Short's photographs of himself.			
NP1 (Local)	0.894	0.636	0.724
NP2 (Long-distance)	0.021	0.182	0.207
NP1/2	0.069	0.000	0.035
Other	0.021	0.046	0.000
TYPE 2A:			
Mr. Short expects Mr. Tall to shoot himself.			
NP1 (L)	1.000	0.818	0.966
NP2 (LD)	0.000	0.035	0.023
NP1/2	0.000	0.000	0.000
Other	0.000	0.091	0.000
TYPE 3:			
Mr. Short thinks that Mr. Tall can tickle himself.			
NP1 (L)	0.979	0.886	0.966
NP2 (LD)	0.021	0.023	0.035
NP1/2	0.000	0.000	0.000
Other	0.000	0.068	0.000

The same pattern of results is shown in the MCC task subject results shown on Tables 5-13 - 5-14. However, there is an erosion in the level of consistent responses on any single LD antecedent category on Type 1 sentences. In addition, a more conservative measure (≥75%) is used on 3 of the 4 sentence types (reflecting differences in number of tokens/sentence type) included in this analysis. Some degree of lack of consistency on Type 1 sentences might be attributed to the greater number possible responses on Type 1 biclausal sentences (i.e., 7 rather than 3 choices). However, the lack of consistent responses may also reveal greater variability in the interlanguage grammars of these L2 learners. The results for both age and proficiency groups suggests that while long-distance as well as local antecedents are possible, L2 learners show little evidence of settling on a particular NP antecedent choice across sentence types.

On Type 1 sentences with reflexives in complex NPs in object position, 13% of the L2-ADOL group consistently (≥67%) select NP2 and another 5% select the NP1/2 option. The percentage of group members who consistently bind reflexives to the local antecedent is identical for the L2 learner groups, 59%. The control groups are also similar in the consistency of their interpretations of reflexive sentences with CPNPs in object position (92% NS-ADOL; 91% NS-A).

Subject results on Type 2B object control infinitival sentences indicate that 13% of the adolescent L2 learners consistently select LD (LD and LD/Local) antecedents. No subject in either the adult L2 learner group or the adult control group consistently bound reflexives to antecedents outside the infinitival clause. 4% of the adolescent control subjects consistently select LD antecedents. The target grammar local binding-only pattern is exhibited by 72% of the adolescent L2 learners group. As in the aggregate results, the adult L2 learners more closely approximate control behavior on Type 2B sentences.

Subject results on Type 3 sentences reveal consistent strict local binding of reflexives in tensed biclausal sentences by subjects in all groups.

TABLE 5-13:
Results of Multiple Choice Comprehension Task:
CONSISTENT INTERPRETATION BY SUBJECTS IN AGE GROUPS

Proportion of group members with consistent responses showing coreference between a reflexive and an indicated NP, by sentence type, for adolescent and adult groups of L2 learners and adolescent and adult native speaker controls.

	NS-ADOL	NS-A	L2-ADOL	L2-A
n =	25	22	39	34
TYPE 1: (Combined results: Object position CPNP sentences)				
NP1 (L)	0.920	0.909	0.590	0.588
NP2 (LD)	0.000	0.046	0.128	0.029
NP1/2	0.040	0.000	0.051	0.059
Other	0.000	0.000	0.000	0.000
≥67%				
TYPE 2B:				
Alex forced John to listen to himself.				
NP1 (L-PRO)	0.920	1.000	0.718	0.882
NP2 (LD)	0.000	0.000	0.077	0.000
NP1/2	0.040	0.000	0.051	0.000
Other	0.000	0.000	0.000	0.000
≥75%				
TYPE 3:				
Kristina says Vera talks about herself all the time.				
NP1 (L)	0.960	1.000	1.000	1.000
NP2 (LD)	0.000	0.000	0.000	0.000
NP1/2	0.000	0.000	0.000	0.000
Other	0.000	0.000	0.000	0.000
≥75%				

The subject results on the MCC task by proficiency group again reflect the binding pattern shown in the group results, as shown on Table 5-14. For all Type 1 CPNP object position sentences, control subjects (92%) show a much higher degree of consistent local binding than subjects in either proficiency group (L1-LO: 64%; L2-HI: 52%). However, a very low percentage of subjects in the high proficiency group (7%) consistently select LD antecedents, while 18% of

the low proficiency learners consistently select LD antecedents.

There appears to be a stronger proficiency than age effect in interpretations of reflexives in Type 2B object control infinitival sentences. Almost the same percentage of high proficiency L2 learners (93%) as control subjects (96%) show consistent binding of reflexives in Type 2B sentences. Low proficiency L2 learners are much more likely to select LD antecedents, 11% consistently choose LD antecedents and only 70.5% consistently bind reflexives locally.

Subject results by proficiency group support other evidence that these L2 learners have a +AGR parameter setting. As shown on Table 5-14, subjects in all groups consistently bind reflexives in tensed biclausal sentences to the local antecedent, the subject of the embedded clause.

TABLE 5-14:
Results of Multiple Choice Comprehension Task:
CONSISTENT INTERPRETATION BY SUBJECTS IN PROFICIENCY GROUPS

Proportion of group members with consistent responses showing coreference between a reflexive and an indicated NP, by sentence type, for low and high proficiency groups of L2 learners and native speaker controls.

	CON	L2-LO	L2-HI
n =	47	44	29
TYPE 1: (Combined results: Object position CPNP sentences)			
NP1 (L)	0.915	0.636	0.517
NP2 (LD)	0.021	0.136	0.000
NP1/2	0.021	0.045	0.069
Other	0.000	0.000	0.000
≥67%			
TYPE 2B: Alex forced John to listen to himself.			
NP1 (L-PRO)	0.958	0.705	0.931
NP2 (LD)	0.000	0.068	0.000
NP1/2	0.043	0.046	0.000
Other	0.000	0.000	0.000
≥75%			
TYPE 3: Kristina says Vera talks about herself all the time.			
NP1 (L)	0.979	1.000	1.000
NP2 (LD)	0.000	0.000	0.000
NP1/2	0.000	0.000	0.000
Other	0.000	0.000	0.000
≥75%			

5.5. Discussion

The overall pattern of results indicates that reflexive binding in a second language is constrained by Universal Grammar. In addition, the results show that the anaphor type found in the native language may crucially affect the way in which reflexives are interpreted in the target language. A significant number of L2 learners in this study showed evidence of transfer of the L1 X^0 anaphor type to their interlanguage grammar. The effect of the consequent

misclassification of English XP reflexives as X° anaphors is shown in high levels of acceptance of long-distance antecedents for reflexives in sentences that lack an X-bar compatible SUBJECT (i.e., AGR) in the local domain. Finally, it appears that subjects do not simply surface transfer lexical elements or whole constructions, but are able to access a UG-constrained deductive system to establish binding domains for the target language.

Results of the two sentence comprehension tasks lead to the following set of conclusions and implications:

(1) Response patterns on the two tasks suggest these L2 learners have a +AGR parameter setting but that the morphological complexity of the English reflexive has not been recognized by a substantial number of these L2 learners.

This conclusion is supported by results on the object position CPNP Type 1 sentences and Type 3 tensed biclausal sentences. LD responses on Type 1 sentences primarily provide information about the anaphor type assumed by these L2 learners, while local responses to Type 3 sentences establish the +AGR parameter setting operating in the grammars of these learners.

CPNP sentences occur in both Serbo-Croatian and English. However, the governing category for reflexives in CPNP constructions in these languages differs. For the X° reflexive in Serbo-Croation, the [NP,NP] Specifier subject of the complex NP is not an eligible SUBJECT, since only

clausal AGR, another X° element, can set the local binding domain. Thus, CPNP constructions provide syntactic environments in which the effect of anaphor type is apparent in languages that have morphologically overt AGR.

The pattern of LD binding by L2 learners on object position CPNP sentences on both tasks suggests that the X°/+AGR binding configuration is present in the interlanguage grammar of a significant number of these learners. This result supports Hypotheses A and B.

Results on tensed biclausal Type 3 sentences across task type strongly indicate that these L2 learners have grammars with overt morphological AGR. Although the source of the AGR parameter setting (i.e., UG or transfer) cannot be unambiguously established when the L1 and L2 grammars have identical values, it is clear that these L2 learners have not initially adopted a Chinese-type -AGR parameter setting. This finding is also supported by results on biclausal Type 1A (CPNP) sentences on the MCC task.

A somewhat different picture is presented by the results on Type 1C sentences. Low profiency learners produce a significantly higher number of LD responses on sentences with reflexives occurring in subject internal position. LD binding outside tensed clauses is only permitted in languages with a X° reflexive/-AGR binding configuration. In light of the robust result on Type 3 sentences the presence of -AGR in the grammars of these learners seems improbable.

It is likely that other, perhaps pragmatic, factors may account for LD binding across the indicative clausal barrier in Type 1C sentences by low proficiency learners. There is some indication from L1 acquisition research[10] that sentences of this type are difficult to process.

Overall, L2 learners who permitted LD binding in their interpretations of English reflexives restricted antecedents to the minimal finite clause. This is consistent with Serbo-Croatian, Russian, and Scandinavian languages which have X° reflexives and morphologically overt AGR.

(2) The high level of local binding of reflexives achieved by most of the L2 learners indicates morphological complexity of anaphoric elements is a learnable feature of language. Over 50% of the L2 learners in this study show evidence of consistent local reflexive binding in the individual subject analysis.

(3) When a binding domain resulting from the interaction of an X° anaphor type and an AGR parameter setting is not instantiated in the native language, L2 learners must use their grammar to set the domain when relevant constructions are encountered in the target language. Computation of binding domains by L2 learners requires operation of a UG-constrained deductive system.

This claim is supported by the results on Type 2B object control infinitival sentences. Object control structures provide the crucial test structure for isolating aspects of the interlanguage grammar that may be attributed to surface transfer (i.e., X° anaphor type, +AGR parameter setting) from those that may reflect access to Universal Grammar. Because object control infinitivals are not present in the Mostar dialect of Serbo-Croatian, these learners had not previously computed the binding domain for the X° reflexives

in these constructions.

Evidence of LD binding by L2 learners lacking L1 knowledge of the domain restrictions on anaphor-antecedent coreference in these constructions suggests that L2 learners do not simply transfer whole constructions, but that they resort to a UG-constrained deductive system to define binding domains in the target language.

LD binding of reflexives in object control sentences by low profiency L2 learners suggests that the predicted pattern of binding found in languages like Russian, which has the +AGR/X° reflexive configuration, may occur in the L2 despite lack of L1 instantiation. Since object control sentences provide the only null subject environment for testing LD binding across infinitival [NP,IP] SUBJECTs, this is an important result. It suggests that computation of binding domains is not limited to L1 acquisition and that the interaction of the transferred X° reflexive and the +AGR setting results in the predicted domain extension. Results on Type 2B sentences support Hypothesis C.

The contrast between results on ECM (Type 2A) and object control (Type 2B) infinitival sentences raises a number of methodological and theoretical questions. In contrast to the signficant level of LD binding on object control sentences by low proficiency and adolescent L2 learners, interpretations of reflexives in ECM infinitivals show no evidence of LD binding. This result on ECM sentences

on the PI task fails to support Hypothesis C.

Differences in response behavior on object control and ECM infinitival sentences suggest that reflexive binding may be sensitive to the type of subject present in the embedded clause. In English infinitival sentences, the subject in control sentences is null (PRO), while in ECM sentences, an overt lexical subject is present. Since ECM structures are not present in Serbo-Croatian, the binding domain for reflexives in English ECM structures must be established in L2 acquisition. For learners with an X°/+AGR configuration in their interlanguage grammar, it appears that the presence of a lexical NP in embedded subject position blocks coreference outside the infinitival clause.[16]

The split between ECM and object control sentences may also reflect task differences since these sentence types occur on different tasks. Although selection of a local antecedent is a legitimate option in languages with X° reflexives[17], the rejection of LD binding on ECM sentences in the PI task needs to be further investigated.

(4) Interlanguage grammars may exhibit UG-constrained variability when a major shift in the grammar is being incorporated.

L2 learners may show evidence of transitional stages in the development of interlanguage grammars. As L2 learners shift toward the L2 XP/+AGR configuration, there may be residual effects from transfer of L1 knowledge of reflexive constructions. This may account for the greater variability

shown in the subject data on CPNP sentences on the MCC tasks, as reported in Tables 5-13 and 5-14. Less proficient (and adolescent) L2 learners show greater consistency in their choice of long-distance antecedents(s) than subjects in the high proficiency (and adult) L2 learner groups. If a stable X°/+AGR configuration guides reflexive interpretation in the grammars of less advanced learners, this might be reflected in greater consistency of response.

(5) The results on these sentence comprehension tasks may under-represent the range of antecedents for reflexives permitted by L2 learners.

For L2 learners who have transferred the X° anaphor type to the target language, some English sentences in this study are ambiguous. To overcome the tendency of subjects to report preferred rather than all possible antecedents, two experimental task types were used in this study in addition to a training session. The results suggest that the full range of potential antecedents for reflexives in potentially ambiguous Type 1A, Type 1B, and Type 2B sentences were not exhibited by subjects who permitted LD antecedents for English reflexives.

L2 learners in this study were pretrained to recognize and identify multiple readings of sentences and were asked to individually judge each of the four pictures in PI task items rather than to select the picture the represents the sentence. However, despite these efforts, the incidence of multiple readings in this study is low. This suggests that

both the role of preference and the rejection of ambiguity need to be further examined in future research. At the present level of sophistication in experimental methods, the use of multiple task formats provides an essential means of determining the validity of any single set of results.

The general conclusion that may be drawn from this study is that L2 learners may initially transfer the L1 anaphor type to their interlanguage grammar, resulting in interpretations of target grammar reflexives which reflect L1 influence. Further, in cases where binding domains are not instantiated for reflexives in particular syntactic contexts in the L1, the binding domain may be computed in the course of second language acquisition.

NOTES

1. Logophoric use of X^0 reflexives and discourse binding of XP reflexives (see, for discussion Sigurjónsdóttir and Hyams 1992, Kameyama 1984, Reinhart and Reuland 1991, Sells 1987, among others) are not considered here since cases of non-syntactic binding are not subject to Principle A. Syntactically bound XP reflexives are restricted to local antecedents.

2. This excludes cases of apparent long-distance (i.e. discourse) binding in English (Cantrall 1974; Jackendoff 1968, Sells 1987; Zribi-Hertz 1989). It also does not take into account cases of anaphors binding other anaphors, as in the following example from James Huang cited in Progovac (1993b):

(i) John believed himself$_1$ to have persuaded himself$_2$ to criticize himself$_3$

Although instances of apparent LD binding of these types may occur in the L2 input, they are predicted to have little effect on the acquisition of syntactic binding. This is due to the rarity of occurrence of some of the structures, the marginal grammaticality of others, and the assumption that discourse binding is subject to a pragmatic module of the grammar, separate from the binding module.

3. An alternative approach involving transfer of the L1 deductive system to the interlanguage grammar would produce the same result. However, the mechanism of transfer of this nature is unknown.

4. Though if, as Thomas (1991c) suggests, preference actually blinds subjects to ambiguity, then this task is also subject to preference bias. The use of a Truth-Value Judgement task (see, for discussion, Chapter 4, fn.2) that individual testing of picture-sentence pairs may further reduce preference bias.

5. Use of a Minimal Distance Strategy to assign antecedents to reflexives involves selection of the nearest NP as the antecedent. In a sentence such as: Mr. Short wants Mr. Tall to point to himself, use of this strategy produces the correct local antecedent, Mr. Tall. However, this strategy produces incorrect local antecedent choices in pronoun sentences: Mr. Tall wants Mr. Short to tickle him.

6. One of the Gender task items was dropped from the analysis due to ambiguity of the name "Alex."

7. Wexler and Chien (1985:142) used similar structures to test children's knowledge of c-command.

(i) The sister of Cinderella points to herself.

However, there is reported dialectal variation in the acceptability of these structures (Lydia White 1993:personal communication). For some native speakers, this construction must have the following "double" genitive form:

(ii) The sister of Cinderella's points to herself.

8. Potential pragmatic bias on test sentences may occur as the result of the use of particular lexical items. For some native speakers, to listen to yourself is an idiomatic expression (Jerry Berent 1994:personal communication). However, the use of multiple instruments and particularly picture prompts reduces response bias of this type. Extensive piloting of test sentences provides the surest guarantee of a "clean" set of test items.

9. Some native speakers are sensitive to the choice of nouns used in CPNP constructions. Although the English control data in L2 acquisition studies by Bennett (1994), Cook (1990:589), and Lee (1992:128) overwhelmingly favor locally binding of reflexives occurring in "picture NPs", Thomas' (1991a:171) control subjects permitted LD binding in 51% of their responses. Less variation may occur in complex NPs when nouns such as description, criticism, or song replace photo or picture (Lydia White 1994:personal communication). Controls in this experiment do not show this distinction.

10. The effectiveness of the two extraneous illustrations in reducing the number of correct guesses varies across sentence type. In this case, English SVO word order facts may provide sufficient information to rule out pictures (b) and (d). I would like to thank Patsy Lightbown for pointing this out to me.

11. Berent (1994) claims that two factors may reduce the reliability of responses on MCC tasks: 1) ordering the "or" choice in final position favors initial identification of a preference, and 2) the "or" option is ambiguous with both an inclusive (i.e., either (a) or (b), or both) and an exclusive (i.e., either (a) or (b), but not both) reading.

12. Exceptional Case Marking occurs in Serbo-Croatian, though only in small clauses:

(i) Milan ne želi Veru u svojoj kući
Milan not wants [Vera-ACC in his house]
Milan does not want Vera in his house

(ii) Milan ne smatra Veru sebičnom
Milan not considers [Vera-ACC selfish-INSTR]
Milan does not consider Vera selfish

The same pattern occurs in Russian (Michael Yadroff 1993: personal communication).

13. The saliency of [NP,NP] subjects has been discussed by Thomas (1991a:106) who suggests that L2 learners may not "generalize the notion of 'subject' from [NP,IP] to [NP,NP]." This would have the effect of reducing LD binding on CPNP sentences by low proficiency learners to binding to the closest c-commanding NP. However, this does not account for the high rate of LD binding outside CPNPs by high proficiency L2 learners (and adult L2 learners) on the object position CPNP sentences. Further, Serbo-Croatian has [NP,NP] subjects which have syntactic effects in reflexive binding, suggesting these elements are salient in the L1.

14. To locate the source of this difference, another ANOVA with both age and proficiency factors was completed. It again showed group effects: ($F(5, 114) = 3.935$, $p=.003$) with group differences on the post hoc Scheffé procedures ($p=<.05$) limited to the L2-LO-ADOL group vs. the NS-A group and the L2-LO-ADOL group vs. the L2-HI-A group. This suggests that the proficiency level of several L2 adolescent subjects is too low for the task demands; they may lack knowledge of the specific vocabulary and structures contained in the 4 tensed biclausal sentences on the MCC task. Since the margin of error is so narrow on Type 3 sentences, inclusion of weak proficiency subjects may result in significant group differences.

15. See Wexler and Chien (1985) for the use of subject internal possessive NPs as potential antecedents for anaphors and pronouns. Grimshaw and Rosen (1990) suggest that sentences of this type are difficult to process, resulting in reduced performance by child subjects. This claim is supported by the results from the L1 acquisition study by Deutsch, Koster and Koster (1986).

16. An analogous situation exists in another set of binding structures in Serbo-Croatian. Binding domain extensions that occur in the licensing of negative polarity items in Serbo-Croatian also has an apparent "no lexical NP" requirement (Progovac 1991b:568, fn.2). Following Borer (1989) and Huang 1984), I will assume only minor features distinguish PRO and pro null elements. It appears that negative polarity items may be licensed by matrix negation when the embedded clause is a complement of a class of verbs that includes"žel(j)eti" (wish) and "ht(j)eti"(want). However, the subject of the

embedded clause must be null. In the following examples, licensing of the negative polarity item nikoga is blocked by the presence of an overt subject in the embedded clause.

(i) Mira ne želi da vidi nikoga
Mira$_i$ not wishes [that pro$_i$ sees no-one]
Mira does not want to see anyone

(ii)*Mira ne želi da Petar vidi nikoga
Mira not wishes [that Petar sees no-one]
Mira does not want Petar to see anyone

Blocking by lexical NPs in binding structures that rely on the content of INFL suggests that additional factors may affect domain definition.

17. Although this is generally true, X° reflexives in some languages are restricted to long-distance antecedents. Vikner (1985) reports that local antecedents for Danish sig are not permitted.

APPENDIX 5-1: TEXT OF CLOZE TEST*

Before daybreak, three of the boys met near the old bridge. The fourth, a boy by the (name) of Bobby, had not arrived. (No) one was surprised that he (was) not there because they knew (that) his mother did not want (him) to come on this camping (trip). Jack, who was the group's (leader), waded into the shallow water (near) the bridge and pulled the (boat) ashore. Then the boys loaded (it) with the food, blankets, and (other) things they were taking on (their) trip.

At sunrise, they climbed (into) the boat, pushed off, and (began) their trip. A fast current (carried) them downstream, so they did (not) have to row. They took (turns) keeping the boat in the (middle) of the river. Three hours (later), they entered the woods where (they) planned to spend the next (few) days.

"Let's go ashore now (and) fix some lunch," suggested Jack. (While) Jack tied up the boat, (the) other two boys started to (look) for wood for a fire. (When) they came back ten minutes (later), they found Jack looking very (worried). "We don't have any matches," (he) announced gloomily. "Bobby was supposed (to) bring them." This was bad news. They were miles away from home now.

* Adapted from D. Byrne and E.T. Cornelius, Jr. 1978. 30 passages. White Plains, NY: Longman.

APPENDIX 5-2: TEST SENTENCES BY TASK AND TYPE

PICTURE IDENTIFICATION TASK

Type 1: Sentences with reflexives in complex NPs (CPNPs)

(16) Mr. Tall is selling Mr. Short's photographs of himself.
(18) Mr. Tall knows that Mr. Short is pointing at Mr.Tall's picture of himself.
(14) Mr. Short wants Mr. Tall to point to Mr. Short's picture of himself.

Type 2A: Infinitival (ECM) biclausal sentences

(2) Little Cat wants Big Cat to bite himself.
(6) Mr. Tall wants Mr. Short to look at himself in the mirror.
(11) Mr. Short expects Mr. Tall to shoot himself.

Control Type 2A: Pronoun sentences

(12) Little Cat wants Big Cat to lick him.
(17) Mr. Tall expects Mr. Short to point at him.
(5) Mr. Tall wants Mr. Short to tickle him.

Type 3: Tensed biclausal sentences

(10) Mr. Short sees that Mr. Tall is pointing to himself.
(15) Mr. Short thinks that Mr. Tall can tickle himself.
(19) Little Cat knows that Big Cat was licking himself.

Control Type 3: Pronoun sentences

(1) Mr. Tall thinks that Mr. Short is going to shoot him.
(8) Little Cat thinks that Big Cat is going to bite him.
(13) Mr. Short knows that Mr. Tall is looking at him in the mirror.

Distractor sentences

(4) Mr. Short is giving Mr. Tall his photographs of himself.
(20) Mr. Tall showed Mr. Short a picture of himself.
(3) Mr. Tall thinks that Mr. Short will sell the photograph of himself.
(7) Mr. Short wants Mr. Tall to sell the photograph of him.
(9) Mr. Tall is looking at Mr. Short's photograph of him.

MULTIPLE CHOICE TASK

Type 1: Sentences with reflexive in complex NPs (CPNPs)

Type 1A: CPNPs in tensed clauses
(8) Kristina liked Vera's picture of herself.
(20) Bobby likes Peter's song about himself.
(5) Michael says that Peter read John's letter about himself.
(10) Vera said Kristina believes Mary's story about herself.

Type 1B: CPNPs in (subject control) infinitival clauses
(4) John wants to buy Michael's photographs of himself.
(15) Nina wants to read Kristina's book about herself.

Type 1C: CPNPs in embedded subject position
(13) Alex thinks that Michael's film about himself will win a prize.
(19) Kristina thinks that Mary's opinion of herself is wrong.

Type 2B: Infinitival (object control) biclausal sentences
(2) The policeman ordered the military officer to shoot himself.
(17) The Nazi officer ordered the American officer to kill himself.
(6) The priest forced the man to pray for himself.
(11) Alex forced John to listen to himself.

Type 3: Tensed biclausal sentences
(3) Kristina says Vera talks about herself all the time.
(9) Peter says a soldier must always prepare himself for battle.
(14) John said that his father talked about himself only one time.
(16) John said that Peter prepared himself for the race by lifting weights.

Control sentences: Use of Minimal Distance Strategy
(1) A friend of Nina introduced herself to Mary.
(18) A colleague of Peter introduced himself to the man from Tokyo.
(7) A girlfriend of Suzana hurt herself while skiing.
(12) During the football match, a friend of Peter hurt himself.

Chapter 6

CONCLUDING REMARKS

6.0 Introduction

This thesis investigates issues raised by several converging lines of research that have contributed to the development of UG-based acquisition research on anaphoric binding. These include research on the syntax of anaphora, assessment of the empirical validity of revised accounts of Binding Theory for L1 and L2 acquisition, and experimental research on learners' knowledge of reflexives in a second language.

6.1 Implications for Linguistic Theory

As in any study of language learning, an adequate description of the native and target language structures and a theoretical account of these structures must be offered. The absence of relevant syntactic data presented the first major research problem to resolve. Data for this component of the thesis was collected in Mostar, Bosnia-Hercegovina. Additional, and comparative, data from native speakers of dialects of Serbia and Vojvodina was obtained from native speaker informants living in Canada and the United States. In addition to extending the range of data on Serbo-Croatian anaphora, accounts of the data were examined in terms of standard and several revised approaches to the Binding Theory. On the basis of its conceptual simplicity, explanatory potential, and reliance on triggers for acquisition

involving only the lexicon and functional categories, the Relativized SUBJECT model (Progovac 1992) was selected as the theoretical framework for the experimental component of this research.

In any acquisition study, the predictions generated by the linguistic analysis are tested in addition to the predictions of acquisition theory. For example, we may test an hypothesis that states that knowledge of the coreference properties of anaphors can be acquired in the course of learning a second language. The assumptions tested here include the systematic characterization of the coreference properties of anaphors and their antecedents proposed by the theoretical framework as well as the contention that the L2 interlanguage grammar of anaphora will be constrained by Universal Grammar.

The viability of the Relativized SUBJECT analysis was examined in a study of the acquisition of English reflexive binding by native speakers of Serbo-Croatian. The results are consistent with the Progovac analysis. L2 learners showed evidence of a UG-constrained deductive system operating in the interlanguage grammar. Further, these learners also appear to have initially transferred the X^0 anaphor type to the target grammar, resulting in the predicted pattern of misinterpretation of English reflexives. These features of the theory appear to have withstood experimental investigation. However, two aspects of Relativized SUBJECT were not tested in this study and remain questions for future research:

(1) the status of the entire cluster of properties associated with X° and XP reflexives, specifically the interpretation of reflexives in sentences with potential antecedents that are LD objects, and (2) the operation of the proposed trigger for a shift from an L1 X° reflexive to an L2 XP reflexive which involves recognition of the morphological complexity of the L2 reflexives. These and related questions provide an interesting set of problems to address in subsequent work on L2 acquisition of reflexive binding.

6.2 Implications for L2 Acquisition Theory

The major contribution of the experimental study reported in this thesis is the evidence it provides that the grammars of L2 learners show evidence of L1 transfer within an interlanguage system constrained by Universal Grammar. Further, by testing interpretation of reflexives in L2 structures not instantiated in the L1, it offers evidence of the operation of a UG-constrained deductive system in L2 acquisition. Whether the locus of this deductive system is within the interlanguage grammatical system or in Universal Grammar itself is a question that can only be resolved in future empirical and theoretical research. The experimental study also provides new acquisition data involving speakers of a language that has long-distance binding that is restricted to the finite clause. Future work in Icelandic and other languages with LD binding within the indicative clause may also provide insights into the L2 acquisition process.

Two other areas of the Binding Theory which may yield to future investigation involve: (1) the binding of pronouns and R-expressions, and (2) the role of logophoricity in interpretations of reflexives. Pronominal binding has been explored in L1 acquisition research (cf. Avrutin and Wexler 1992; Chien and Wexler 1991; Grimshaw and Rosen 1990; Grodzinsky and Reinhart 1993; McKee 1992) and has prompted distinctions between pragmatic and syntactic constraints on binding that pose interesting questions for L2 research. Questions concerning the distinction in coreference properties of reflexives in argument and non-argument positions have been raised by Reinhart and Reuland (1991) and others. Testing the empirical validity of such proposals in L2 acquisition research may be productive.

The final area of research that is suggested by the results of this acquisition study involves the variability of the grammars of L2 learners. The notion that acquisition of a second language, and particularly parameter resetting, involves some indeterminacy has been proposed by Sorace (1988, 1991), and others. Future research on the effects of shifting AGR parameter values on the interpretations of X^0 reflexives may offer additional understanding of the nature of second language acquisition.

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