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Overlapping Reference and Its Implications for the Binding Theory

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by

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ABSTRACT

The phenomenon of overlapping reference played a crucial role in the development of the binding theory. It was claimed that overlapping reference between a pronoun and a local antecedent is ungrammatical, leading to the formulation of Principle B as a disjoint reference rule. This was also used as an argument against attempts to derive the distribution of pronouns from a competition with reflexives. Over the years claims have emerged that the facts originally assumed regarding overlapping reference are inaccurate. In this paper I set out to answer two questions. First, does the binding system enforce disjoint reference or does it only enforce non-coreference for pronouns? And second, is the distribution of pronouns derived from a competition with reflexives or from an independent principle? I present a comprehensive overview of the literature on overlapping reference, following which I conduct a judgments study in Hebrew to fill in gaps in the empirical picture. I examine the effect of the following factors on expressions of overlapping reference: interpretation of the predicate (distributive versus collective), antecedent number (singular versus plural) and distance from the antecedent (local overlapping reference, overlapping reference in ECM, or overlapping reference across embedding). I also compare overlapping reference with a pronoun to overlapping reference with a reflexive. Following the results of this study I conclude that the binding system does not enforce disjoint reference, but rather non-coreference. I further conclude that the facts are not compatible with a competition theory that derives the distribution of pronouns from that of reflexives, but rather the facts are compatible with the existence of an independent semantic Condition B.

CONTENTS

INTRODUCTION

The broad goal of this thesis is to contribute to our understanding of human cognition. How do we make sense of the world? Which of the infinite types of relations that hold between entities in the world play a key part in the way we conceptualize reality?

I believe that these and other questions can be answered by an examination of the way we speak. Not just the content of what we say, but also the way we structure this content into meaningful sentences.

In this paper I focus on the way the structural relations between nominal phrases can determine the possible semantic relations between them. While this paper answers questions that have been debated within the linguistic literature and is coached in linguistic terminology, it is important to remember that linguistic questions are simply questions about human cognition. Specifically, when we ask about the possible relations between nominal phrases that stand in a certain structural relationship, we are actually asking the question: which semantic relations are important enough in human perception to get coded into grammatical rules?

This field is known mainly as 'binding' in linguistics. A 'bound' nominal phrase is one whose reference is interpreted as identical to the reference of a linguistic antecedent in the same clause or the same sentence (i.e. a succession of embedded clauses).

The semantic relation on which I focus in this paper is partial identity of reference between two nominal phrases. This relation has received various names in the literature: partial coreference, inclusive reference anaphora and overlapping reference. I will use the name overlapping reference (abbreviated as OLR) throughout this paper.

OLR is the phenomenon in which the reference of one expression is included within the reference of another expression, as in (1) where the reference of the pronoun *I* is included in the reference of the group *we*.

(1) I think we are going to win

Overlapping reference can also occur between definite descriptions *("The first graders think the students in this school are the smartest"),* but I will limit my investigation to cases involving a reflexive pronoun or a personal pronoun.

I will refer to reflexive pronouns such as 'himself' simply as 'reflexives', and use the name 'pronoun' for personal pronouns such as 'he' or 'him'.

I will assess what factors influence the grammaticality of sentences with OLR, and consider how this impacts linguistic theories about binding. More specifically, I will use the data I gather on the phenomenon of OLR to choose between two theories regarding how the distribution of bound pronouns is restricted. One theory claims that the distribution of bound pronouns is derived from the distribution of reflexives, so that where reflexives can be used, bound pronouns cannot. Another theory claims that there is an independent restriction on the distribution of pronouns. In a broader sense, the question is actually about the mental process that we go through when we construct or hear a sentence. Do we compare between forms and choose the one best fitted for our needs, or do we only check that the form in front of us is suitable without ever giving a thought to alternative forms that can be used instead?

I will begin this paper by outlining two pertinent debates in the binding literature. In section 1.1 I will discuss the debate on the nature of the restrictions on the distribution of pronouns, i.e. whether they are derived from a competition with reflexives or from an independent constraint on pronouns. Section 1.2 will sketch the debate on the type of relations that the binding theory regulates, namely is there a syntactic requirement for disjoint reference between a pronoun and an antecedent. In section 2.1 I will review the empirical and theoretical claims in the literature regarding OLR, and how they are relevant for the debates in section 1. Then, in section 2.2 I will lay the groundwork for an experimental exploration of OLR in Hebrew by assessing what different theories predict. In section 3 I will present the results of a grammaticality judgments study on OLR that I conducted in Hebrew. These results will shed light on empirically unresolved issues regarding OLR and enable me to conclude what theories are compatible with the empirical state of affairs.

1. DEBATES ON THE NATURE OF THE BINDING RESTRICTIONS ON PRONOUNS

Binding theories aim to describe the permitted syntactic relations between a quantifier or a referential NP (nominal phrase) antecedent and an anaphoric element whose reference is dependent upon that antecedent. The theory that has come to be known as the traditional binding theory is sketched in Chomsky's *Lectures on Government and Binding* (Chomsky, 1981). It divides nominal expressions into three categories: anaphors (reflexives), pronouns and R-expressions (personal names and definite descriptions), defining the distribution of each category in respect to a potential antecedent. The relevant syntactic relations identified are those of distance and c-command.

(2) Definition of binding: α binds β iff α c-commands β and is coindexed with it.

(3) Binding principles:

Principle A: An anaphor is bound in its binding category.

Principle B: A pronominal is free in its binding category.

Principle C: An R-expression is free.

Though Principle B as defined above is very commonly assumed in linguistic works, it has nevertheless been, and still is, at the center of lively debates. Two of these debates will be presented below, and later on in this paper I will provide some evidence that can help tilt the scales in these debates.

1.1. IS THE DISTRIBUTION OF BOUND PRONOUNS RESTRICTED BY AN INDEPENDENT PRINCIPLE OR BY A PRONOUN-REFLEXIVE COMPETITION?

Unlike reflexives, which (usually) require a local antecedent, pronouns do not require an antecedent at all. However, when an antecedent is present, it cannot be in the pronoun's binding domain or otherwise the utterance results in ungrammaticality. This is indeed captured by Chomsky's Principle B. However, when one turns to look

at Principle A that regulates the distribution of reflexives, Principle B becomes arguably redundant as the two conditions seem like a complete mirror image of one another. If the binding domains of pronouns and reflexives are defined in the same manner, these binding conditions then predict a completely complementary distribution between pronouns and anaphors. At this point, the theoretical landscape presents a fork in the road. One can either decide that she can do away with Principle B, deriving it instead from a competition between pronouns and reflexives, or she can opt to reserve the two binding conditions as independent of one another by making sure they are not mirror images of each other. Both strategies have been pursued in the linguistic literature. Below I will provide one illustrative example of each strategy and discuss the empirical justifications for it.

1.1.1. Independent Principle B

A fact that seems to point towards an independent Principle B, that is, that pronouns are banned from certain environments not because reflexives can appear in them and are preferred but rather because there is an independent ban on pronouns, is that reflexives and pronouns are not always in complementary distribution. There are cases in which both can appear, and cases in which neither can appear (examples appear in this section). This is unexpected if the only ban on pronouns is that they simply cannot appear where a reflexive is available.

To capture this, Reinhart and Reuland (1993) (henceforth: R&R) tear principles A and B apart by suggesting that they do not apply at the same level of derivation. Principle A is a syntactic condition, while Principle B is a semantic one. This enables R&R to account for the fact that pronouns and reflexives are not always in complementary distribution. They put forward a predicate-based binding theory, that is, one that downplays the role of c-command and centers instead on the notion of coargumenthood. Their version of Principle B is the condition in (5b).

(4) Definitions:
   a) The syntactic predicate of (a head) P is P, all its syntactic arguments and an external argument of P (subject). The syntactic arguments of P are the

projections assigned theta-role or Case by P
b) The semantic predicate of P is P and all its arguments at the relevant semantic level
c) A predicate is reflexive iff two of its arguments are coindexed
d) A predicate (of P) is reflexive-marked iff either P is lexically reflexive or one of P's arguments is a SELF-anaphor

(5) Conditions:
a) A reflexive-marked syntactic predicate is reflexive
b) A reflexive semantic predicate is reflexive-marked

Their system rules out locally bound pronouns like (6a) because while the predicate is reflexive, i.e. two of its arguments are coindexed, it is not reflexive-marked since pronouns do not reflexive-mark predicates, and so Condition B is violated. (6b) is permitted because the syntactic predicate, which is reflexive-marked by the anaphor argument, contains two coindexed arguments, and ergo is reflexive in accordance with the requirement of Condition A for reflexive-marked predicates.

(6) a. *John$_1$ fed him$_1$.

b. John$_1$ fed himself$_1$.

R&R's Condition A ((5a)) differs from the classic Principle A in that it does not rule out non-locally-bound reflexives, but merely states that when a reflexive serves as an argument to a syntactic predicate, that is, a predicate that has an external argument, the reflexive has to be coindexed with a coargument. R&R's Condition B ((5b)), on its end, only has the consequence of disallowing pronouns to be coindexed with a semantic coargument. And so, in (7) we find complementary distribution between pronouns and reflexives due to the fact that the notion of a semantic predicate and that of a syntactic predicate coincide. So (7a) is ruled in because *he* is not coindexed with a semantic coargument of the predicate *take*, in accordance with Condition B. (7b) is ruled out because *himself* reflexive-marks the predicate *take* but is not coindexed with a syntactic coargument, in defiance of Condition A.

(7) a. Max$_1$ thinks he$_1$ took the wrong bus

b. *Max$_1$ thinks himself$_1$ took the wrong bus

According to this theory, it is the relation between the semantic and syntactic predicate that determines whether or not there shall be complementary distribution between pronouns and reflexives in a given sentence. In canonical cases, there is a complete match between the semantic and the syntactic predicate, and thus canonically we do see complementarity between pronouns and reflexives. However, there are cases in which the semantic predicate differs from the syntactic predicate, and in those cases we will see breakdowns in the complementarity between pronouns and reflexives.

One such case is when neither a pronoun nor a reflexive is acceptable, as in (8a), for example.

(8) a. *Both the queen$_1$ and I praised herself$_1$/her$_1$.

b. The queen (λx ((x praised x) $\wedge$ (I praised x)))

The use of *both* forces a distributive reading of the verb, depicted in (8b). R&R's Condition B operates "*at the relevant semantic level*", which for (8a) is the semantic representation of distributivity in (8b). Condition B then blocks the use of the pronoun, because the semantic representation contains a reflexive conjunct which is not reflexive-marked. Their Condition A rules out the use of the reflexive, because *herself* fails to be coindexed with its syntactic coargument *the queen and I*.

Another breakdown in complementarity is when both anaphors and pronouns are acceptable in the same position, as in (9) and (10).

(9) Lucie$_1$ saw a picture of her$_1$/herself$_1$

(10) Max$_1$ noticed the ghost next to him$_1$/himself$_1$

In (4a) the definition of a syntactic predicate includes the existence of an external argument. While a verb always has an external argument, nominal and prepositional predicates do not. R&R's Condition A thus does not "care" about these predicates[1]

[1] Reinhart and Reuland's principle A does apply in such cases if a subject for the predicate is present: *Lucie$_1$ liked [**your** pictures of herself$_1$]

and if either of them has a reflexive as one of its arguments Condition A has nothing to say about it. For the sake of clarity, we can note that the reflexives are not arguments of the verb but rather situated inside a constituent that is an argument of the verb. Therefore, the verb is not reflexive-marked and Condition A does not demand that the verb be reflexive. As for the acceptability of the pronouns in (9) and (10), no arguments of the nominal/prepositional predicate are coindexed[2], so no reflexive predicate is involved and Condition B is trivially satisfied.

We have seen, then, that in R&R's system there is a fair amount of theoretical space to account for breakdowns in complementarity between reflexives and pronouns, as they are not expected to necessarily be in complementary distribution in the first place. The rules regulating them are checked on different notions of a predicate, that is, there are different notions of what counts as a coargument to them. The fact that canonically we do find them in complementary distribution is accidental, and it is because in most cases the notions of a semantic predicate and a syntactic predicate as defined coincide.

Another thing worth mentioning about this theory is that it derives the badness of bound pronouns in ECM constructions by a separate rule than Condition B in (5b). R&R's Condition B does not rule out (11) and (12), because *John* and *him* are not coarguments of the same semantic predicate and hence Condition B does not require that the predicate be reflexive-marked.

(11) *John$_1$ appears to him$_1$ to be a genius

(12) *John$_1$ believes him$_1$ to be a genius

R&R rule out such examples with an added syntactic rule: the chain condition in (13b).

[2] The case in (14) is one where the preposition is not selected for by the verb, and it thereby creates its own semantic predicate. However this is seemingly not the case for prepositions that are selected by the verb, which do not allow for pronouns (*Lucie$_1$ explained Max to her$_1$)

(13) a. **Definition of a chain**[3]:

(α^1,..., α^n), 1 ≤ n, is a chain iff

(i) every α has the same subscript, i.e (α^1,..., α^n) = ($\alpha_j{}^1$,..., $\alpha_j{}^n$)

(ii) for every i < n, α^i governs[4] α^{i+1}

b. **General condition on A-chains**: a maximal A-chain (α_1, . . . ,α_n) contains exactly one link, α_1, that is both [+R] and Case-marked.

c. An element is [+R] if it is fully specified for number, case and gender.

The chain condition rules out examples like (11) and (12) because they include chains in which pronouns are positioned at the bottom of the chain. Since pronouns are [+R] and Case-marked, according to the chain condition they can only head a chain and cannot be in the same chain with another [+R] and Case-marked link.

1.1.2. PRONOUN-REFLEXIVE COMPETITION

Despite the fact that pronouns and reflexives sometimes display non-complementary distribution, in the overwhelming majority of cases they are mutually exclusive. Accounts like R&R's reflexivity theory may be constructed to capture this, but they fail in providing a "why". Complementarity is merely accidental in R&R's theory, stemming from the fact that in canonical cases the syntactic predicate and the semantic predicate coincide.

Competition approaches refuse to assume that the vast complementarity between pronouns and reflexives is random. Instead, they suggest that this complementarity exists by design, because the forms are in competition. That is, pronouns and reflexives are mentally conceived as elements that serve the same purpose, and reflexives are preferable for this purpose. Only when reflexives are unavailable can pronouns be chosen instead.

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[3] I slightly revised the definition for the sake of clarity

[4] Definition of government:

A governs B iff

- A is a governor (A is a governor iff A is a head of a lexical category or tensed inflection projection)
- A m-commands B (A m-commands B iff neither A and B dominate one another and the first maximal projection of A dominates B)
- No barrier intervenes between A and B

An example for a competition theory is Safir's (2004) theory. His main principle is the Form to Interpretation Principle (FTIP) in (14). This principle means that for a given syntactic context and a given meaning, a comparison is made between different forms available to serve as bound variables in this syntactic context and provide this given meaning. Out of the available forms, the form that is highest on a 'most dependent' scale wins. Different languages have different inventories of expressions that can serve as bound variables or as referential, (15) is the scale for English. Reflexives are at the leftmost position on the scale, i.e. the most dependent form, because they cannot freely refer to entities in the world or in the context, but rather their reference is always interpreted with relation to an antecedent.

It follows from the principle in (14) along with the scale in (15) that pronouns cannot be used as bound variables where reflexives, which are more dependent, can appear.

(14) **Form-to-Interpretation Principle (FTIP)**:
If x c-commands position y, and form z is not the most dependent form available in position y with respect to x, then y cannot be directly dependent on x (the value of the content of y cannot be a function of the value of x)

(15) **Most Dependent Scale for English**:
Reflexive >> pronoun >> R-expression

The effect of ruling in bound pronouns in non-local binding can only come about if reflexives are made unavailable in such cases. So, Safir introduces a version of Principle A. I restate it in (16) in a simplified manner, abstracting away from elements irrelevant for our current purposes.

(16) **Local Antecedent Licensing**: An anaphor must be bound in Domain D (the minimal domain that is a maximal projection containing the anaphor and a sister to it)

The FTIP enforces complementary distribution between pronouns and reflexives, so it is not simply accidental in this theory. Safir argues that instances where the complementarity breaks down are the result of independently motivated constraints.

For example, in (8) repeated below as (17), both forms are unacceptable. Safir argues that this is due to a general constraint in language, stated in (18).

(17) *Both the queen$_1$ and I praised herself$_1$/her$_1$.

(18) **Coargument Dependency Constraint:** If A is identity dependent on B and A and B are coarguments, then for any distributed interpretation of B, A depends on every distributed atom of B in the same way.

Our A in the case of (17) is the pronoun/reflexive, and our B is *the queen and I*. (18) demands that for every atom of *the queen and I*, the pronoun/reflexive should depend on it in the same way. Clearly this does not hold since the pronoun/reflexive depends only on one of the two atoms, *the queen*. So (18) successfully rules out cases like (17).

In the cases in (9) and (10), repeated below as (19) and (20), both forms are acceptable. Safir's explanation is that the reflexives in these cases, not being arguments of VP but rather embedded within a constituent that is an argument of VP, are less dependent than canonical reflexives. The result is that these reflexives reach a tie with pronouns on the scale of most-dependent-form. In case of a tie, there should be no expectation that one form is preferable over the other and both can appear in the relevant position.

(19) Lucie$_1$ saw a picture of her$_1$/herself$_1$

(20) Max$_1$ noticed the ghost next to him$_1$/himself$_1$

We see, then, that both R&R's independent Condition B and Safir's competition principle FTIP can adequately capture the data of fully coreferential pronouns, whether in cases where they are in complementary distribution with reflexives or in cases where the complementarity breaks down. In this paper I am going to look elsewhere for a way to choose between the theories, by looking at cases of partial coreference.

1.2. NON-COREFERENCE OR DISJOINT REFERENCE?

An additional debate in the literature is on the nature of the relation that the binding theory should regulate. Four logical options exist for the relation between the referents denoted by two NPs (Berman and Hestvik, 1997):

a. Coreference: A=B
b. Non-coreference: A≠B
c. Partial overlap in reference: (A∩B≠Ø)∧(A≠B)
d. Disjoint reference: A∩B=Ø

Coreference is the relation of complete identity between the referents of two NPs. Non-coreference is the relation of non-identity. Non-coreferential NPs can denote referents that are partially overlapping in reference, as would be the case for the two NPs *I* and *we*, where the referent of *I* is contained in the set denoted by *we*. Alternatively, non-coreferential NPs can denote referents that are disjoint in reference, as would be the case for the two NPs *the dogs* and *the cats*, where the intersection between the sets denoted by the two NPs is empty.

It is widely accepted that no syntactic configuration obligatorily requires that two NPs overlap in reference, and that there are definitely syntactic configurations in which coreference must obtain between NPs. The point of contention is regarding the relations of non-coreference and disjoint reference. Which of these should the binding theory regulate? Are principles B and C rules of non-coreference, or of disjoint reference? Since the relation of disjoint reference asymmetrically entails that of non-coreference, the question is essentially whether there are syntactic configurations in which non-coreference is obligatory while disjoint reference is not.

The relation of disjoint reference was marked significant by Lasnik (1976), who noticed that examples like (21) cannot be explained solely with regard to non-coreference. In this example, *they* cannot be interpreted as designating *Bob and Tom*. A rule of non-coreference can only assure that *they* and *Bob* are non-coreferential, and that *they* and *Tom* are non-coreferential, but it cannot prevent *they* from designating *Bob and Tom*.

(21) They assume that Bob will talk to Tom

To account for such examples, Lasnik suggested that "*in any structural configuration in which coreference between two NPs is precluded, overlap in reference is also precluded*" (Lasnik, 1976: 102). In other words, Lasnik believed that there are no syntactic configurations in which non-coreference is obligatory while disjoint reference is not. This has led to the formulation of Principle B as a disjoint reference principle ((22)).

(22) If α is a pronoun, interpret it as disjoint from every C-commanding phrase in its binding domain. (Chomsky, 1995: 100)

Seely (1993) challenged the veracity of the principle in (22). He agreed with Lasnik that the syntax does not only enforce coreference versus non-coreference, but can rather disallow partial overlap in reference as well. However, he disagreed with Lasnik's claim that whenever non-coreference is obligatory, the stronger requirement for disjoint reference also obtains.

Seely examined the different possible configurations of split antecedents and found that only in two out of three possible configurations does the rule in (22) make the right predictions. When both antecedents are outside the binding domain of the pronoun ((23)) the principle in (22) correctly allows overlap in reference between the pronoun and each of the split antecedents; when both antecedents are inside the binding domain of the pronoun ((24)), (22) correctly rules out overlap in reference. Thus, in (23) *they* can be understood as designating *Bill and Mary*, while in (24) *them* cannot designate *Bill and Mary*.

(23) Bill_1 told Mary_2 that $\text{they}_{(1,2)}$ should leave

(24) *Bill_1 told Mary_2 about $\text{them}_{(1,2)}$

But when one antecedent is inside the binding domain of the pronoun while the other is outside of it, the principle in (22) fails to make the right predictions as it blocks overlap in reference between the antecedent within the binding domain of the pronoun and the pronoun. Thus, (22) predicts that in (25) *them* could not be

interpreted as designating *John and Mary*, but in reality this is an available interpretation.

(25) $John_1$ said that $Mary_2$ represented $them_{(1,2)}$

In order to rule out overlap in reference in (24) but rule it in in (23) and (25), Seely reformulates Principle B with the new notion that binding is not an 'all or nothing' mechanism ((26)).

(26) a. X is exhaustively bound iff every syntactically dependent member of the index of X is c-commanded by its antecedent; X is free otherwise.

b. A member M of the index of X is syntactically dependent if M is identical with a member of the index of an intrasentential NP; we refer to that NP as the antecedent of M.

c. Principle B: A pronoun must be free (i.e. not exhaustively bound) in its binding domain.

In sentence (23), both members 1 and 2 of the index of the pronoun are syntactically dependent, as they are identical with members of the index of the intrasentential NPs *Bill* and *Mary* respectively. Both syntactically dependent members of the index of *them* are c-commanded by their antecedents, so the pronoun is exhaustively bound. However, since the c-commanding antecedents are outside the binding domain of the pronoun, in its binding domain the pronoun remains free and therefore Seely's Principle B is satisfied and (23) is ruled grammatical. In sentence (24) both c-commanding antecedents are within the pronoun's binding domain, and thus it is exhaustively bound in its binding domain, rendering (24) ungrammatical. In sentence (25), the antecedent for one of the syntactically dependent members of the index of the pronoun is outside the binding domain of the pronoun. The pronoun is thus not exhaustively bound in its binding domain, making the sentence grammatical.

In this system the restrictions on a pronoun alternate between disjoint reference from its antecedents ((24)) and simple non-coreference ((25)), depending on the syntactic configuration.

Two predictions that this system makes have been challenged by Berman and Hestvik (1997). The first has to do with instances of OLR rather than split antecedents, i.e. a situation in which a partial antecedent c-commands the pronoun while an additional partial antecedent is contextually resolved. According to Seely's definition, the pronoun is exhaustively bound in such cases, since every syntactically dependent member of the pronoun's index is c-commanded by its antecedent. This means that if the c-commanding antecedent is within the pronoun's binding domain, Seely's system deems the sentence ungrammatical. Yet, Berman and Hestvik argue that such cases are grammatical ((27)).

(27) Bill_1 and Mary_2 were asked to appear before the committee. But Bill_1 fell ill and had to be excused. John_3 said that Mary_2 represented $\text{them}_{(1,2)}$.

In (27) there is a member of the index that is not identical with a member of the index of an intrasentential NP, namely 1. This member of the index of *them* is therefore not considered syntactically dependent according to Seely's definition ((26b)), and is hence ignored for the computation of exhaustive-boundedness. Since every syntactically dependent member of the index of *them*, i.e. 2, is c-commanded by a local antecedent, Seely's Principle B is violated. We can note that (25), which is grammatical according to Seely's system, differs from (27) by containing a non-local antecedent for the member of the index 1. This way, 1 is considered syntactically dependent and is thus included in the computation of exhaustive-boundedness, making sure that the pronoun is exhaustively bound only outside of its binding domain.

Seely's system could be amended to accommodate cases of OLR by dropping the requirement that only syntactically dependent members of an index count for the assessment of exhaustive binding, leading to (28) as the revised formulation of (26a):

(28) X is exhaustively bound iff every member of the index of X is c-commanded by its antecedent; X is free otherwise.

Yet, Berman and Hestvik claim that even if Seely's system is amended to allow for OLR, it would still incorrectly predict that there should be an asymmetry between singular and plural pronouns in allowing split antecedents and OLR, making the order singular-plural grammatical but the order plural-singular ungrammatical. Seely's revised system would allow for (29b), since one member of the index of the pronoun *them* is not c-commanded by a local antecedent and hence Seely's Principle B is obeyed. However, this system would rule out (29a) in which the only member of the index of the pronoun *her* is c-commanded by a local antecedent, hence making the pronoun exhaustively bound within its binding domain.

(29) John$_1$ and Mary$_2$ often connive behind their colleagues' backs to advance the position of one or the other.

a. This time, they$_{(1,2)}$ managed [PRO$_{(1,2)}$ to get her$_2$ a position in the front office].

b. This time, she$_2$ managed [PRO$_2$ to get them$_{(1,2)}$ a position in the front office].

So while OLR between a singular antecedent and a plural pronoun is predicted to be acceptable, OLR between a plural antecedent and a singular pronoun is predicted to be unacceptable, which Berman and Hestvik claim to be an unwanted prediction. This leads them to renounce the idea that partial overlap in reference is grammatically regulated. Instead, they suggest that the grammar occupies itself only with enforcing coreference or non-coreference.

We have seen that Lasnik believes that the relation of disjoint reference is syntactically required whenever non-coreference is required, and that Seely believes that this is only sometimes so. For Berman and Hestvik, there is no syntactic demand for disjoint reference. Cysouw and Fernandez (2012) attend to this issue and argue that the syntax is not at all responsible for the way speakers judge sentences with OLR, but rather there are non-syntax-related forces at play. They suggest that expressions of OLR describe situations that are quite unusual and infrequent, and that the infrequency of such situations in the world leads to their linguistic

infrequency. They claim that this linguistic infrequency leads speakers to judge expressions of OLR as "strange" and brings about a variability and uncertainty in judgments, but that syntactically there is nothing wrong with OLR.

After I will present the main literature on OLR in section 2, in section 3 I will present the results of an experimental exploration of OLR in Hebrew and infer from them whether the grammar enforces disjoint reference.

2. OVERLAPPING REFERENCE

2.1. THE LITERATURE ON OVERLAPPING REFERENCE

2.1.1. EARLY LITERATURE

The phenomenon of OLR was first discussed by Postal (1969), who argued that there is a contrast in grammaticality between (30a) and (30b).

(30) a. When we finally sat down, I began to speak softly.
b. *We were proud of me.
(Postal, 1969: 416)

This alleged contrast was believed to extend beyond the given examples and was taken to mean that there are restrictions on the possible syntactic relations between a pronoun and an antecedent that overlaps in reference with it, and that these restrictions are the same as those that apply in cases of full coreference between a pronoun and its antecedent ((31a, b)).

(31) a. I think I will win.
b. *I like me.
(Lasnik, 1989: 125)

These facts, along with facts regarding split antecedents discussed in section 1.2, have led to the formulation of Principle B as a disjoint reference rule rather than a non-coreference rule. This, in turn, tipped the scales towards an independent rather than a competition-based Principle B (Kayne, 2002: 144; Berman and Hestvik, 1997: 27). This is because reflexives in English require a fully coreferential antecedent, and are ungrammatical with a partially overlapping antecedent ((32)), and so according to a theory in which the restrictions on the distribution of pronouns arise due to a competition with reflexives, pronouns should be able to occur freely with partial antecedents. The abovementioned restriction on OLR with pronouns thus goes against the predictions of a competition theory.

(32) *We were proud of myself.

2.1.2. DISTRIBUTIVITY VERSUS COLLECTIVITY

R&R (1993) argued that the claim that there is a complete ban on OLR between a pronoun and a local antecedent is inaccurate. They argued that one must take the semantics of the predicate into account, as different predicates yield different results. More specifically, it matters whether the predicate is interpreted as conveying a collective action or a distributive action.

(33) *We voted for me

(34) We elected me

The predicate 'vote' supports a distributive interpretation, while the predicate 'elect' is interpreted collectively. Remember that R&R's Condition B, which states that "*a reflexive semantic predicate is reflexive-marked*", has to apply "*at the relevant semantic level*". They hypothesize that a sentence with a distributive predicate is interpreted, at some semantic level, as a conjunction of sentences in which the predicate holds on atomic entities. And so, the sentence in (33) gets interpreted as (33') below.

(33') I voted for me & X voted for me.

The relevant semantic level for the application of Condition B is (33'), and the existence of the reflexive predicate in the first conjunct leads to a requirement that there be reflexive-marking. Since the predicate is not reflexive-marked, the sentence is deemed ungrammatical.

The sentence in (34) is interpreted collectively, and so no such semantic level exists for it and thus no reflexive predicate exists. Since there is no reflexive predicate, Condition B is trivially satisfied and the sentence is grammatical.

R&R's Condition B is a rule of non-coreference and not of disjoint reference. It rules out coreference between a pronoun and a coargument to it, but not partial overlap in reference between a pronoun and a coargument. The only case in which this condition rules out partial overlap in reference between a pronoun and a coargument is with a distributive interpretation. This is because the condition holds

at a semantic level at which distributive OLR is interpreted as a conjunction of two predicates, one of which is reflexive.

The prediction of R&R's semantic Condition B is therefore clear: OLR should lead to a Condition B violation and hence ungrammaticality only in cases of a distributive interpretation. Kiparsky (2002) and Cysouw and Fernandez (2012) also cite this as an influential factor, suggesting that collectivity improves the acceptability of occurrences of OLR with pronouns. Kiparsky demonstrates that this factor plays a role not only with plural antecedents but also with plural objects, by showing that adding an appropriate context for the collective reading improves acceptability ((35)).

(35) We have a terrific team, I really like us

(Kiparsky, 2002: 19)

Cysouw and Fernandez write off the effects of distributivity versus collectivity as a matter of frequency. They hypothesize that collective interpretations are perhaps more common than distributive ones, and that therefore "*…the asymmetries… are not specific for sentences with partial argument coreference, but might be simply a side-effect of more general frequency effects*" (Cysouw and Fernandez, 2012: 772).

If indeed collective interpretations are more common, one could argue that perhaps the default interpretation for speakers is the collective one. If this is so, and speakers expect a collective interpretation and then have to amend their parsing or understanding of the sentence when they encounter indications that a distributive interpretation is required, then this could be the reason for the lessened grammaticality of distributive sentences with OLR. That is, the effect of distributivity might not be related to the OLR phenomenon at all.

The burden of proof, then, becomes greater for those who want to establish that distributivity-versus-collectivity is of theoretical value in the study of OLR. It is not enough to show that distributive OLR sentences are judged less grammatical than collective OLR sentences. It is necessary to show that this difference, if it at all exists,

is larger in sentences with OLR than in sentences without OLR.

2.1.3. SINGULAR VERSUS PLURAL ANTECEDENT

The most detailed empirical examination of overlapping reference is an English corpus study conducted by Hampe and Lehmann (2013). They used the British National Corpus (BNC) to search for clausal expressions of OLR, meaning instances of local OLR or of OLR in sentences with ECM. They limited their search to first person OLR, because for third person it is impossible to know whether disjoint or overlapping reference was intended, and English uses the same word for singular and plural second person. They found that OLR with a singular antecedent and a plural object was much more common than OLR with a plural antecedent and a singular object. 95.8% of the OLR expressions retrieved had singular subjects, while only 4.2% had plural subjects. In order to evaluate the significance of this trend, they created two control groups of sentences also retrieved from the BNC corpus. One contained sentences with third person and disjoint reference, and the other contained reflexive sentences with first person. They compared the singular-versus-plural-subject proportions between the groups, and found that the proportion seen in the OLR group differs significantly from both the disjoint reference group and the reflexive group. In other words, they found that sentences with OLR exhibit a dispreference for plural antecedents that is not present at the same magnitude in reflexive sentences or sentences with disjoint reference.

Rooryck (2006) reports a similar asymmetry in French so that local first person OLR is possible with a singular subject and plural object ((36)), but not with a plural subject and a singular object ((37)).

(36) Je nous ai acheté des billets
'I bought us tickets'

(37) *Nous m'avons acheté des billets
'we bought me tickets'

He further reports that the grammaticality of OLR with a singular subject and plural object does not extend to second person ((38)) and third person ((39)).

(38) *Tu vous as acheté des billets
'you(sg) bought you(pl) tickets'

(39) *Il leur a acheté des billets
'he bought them tickets'

He suggests this difference between first person on the one hand and second and third person on the other stems from the fact that first person plural pronouns have a richer expressive power and are thus more structurally complex. He is referring to the contrast between an exclusive *we* and an inclusive *we*, a contrast that is not overtly marked in French yet is marked in many other languages. This contrast leads him to suggest that the internal structure of a plural first person pronoun is the one in (40), in which *we* is essentially built from a singular first person along with added referents. In his analysis, the head *without* is pertinent for both inclusive and exclusive interpretations.

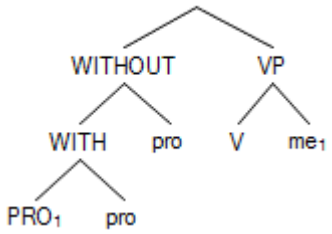
(40) Internal structure for 'we'/'us':
[[PRO WITH pro] WITHOUT pro]
a. inclusive interpretation:
[[me WITH you] WITHOUT him]
b. exclusive interpretation:
[[me WITH him] WITHOUT you]

The first person singular element within this structure is located in the specifier of a specifier position. Since it is so deeply embedded, Rooryck argues that its binding domain reduces, so that its binding domain is in fact the internal structure of the first person plural. It is thus free to overlap in reference with any NP outside of its internal structure.

If we take the internal structure proposed by Rooryck to be justified, then the fact that a plural first person object pronoun can overlap in reference with a singular subject is derived. However, I argue that this analysis faces a problem when we turn to the additional fact about first person pronouns, i.e. that a singular first person

object pronoun cannot overlap in reference with a plural subject. This is visible from the tree in (41), where it is clear to see that the singular element within the plural first person subject pronoun does not c-command the object pronoun. Since there is no c-command, there can be no Principle B violation, and hence such sentences should be grammatical contrary to fact.

(41)



It should be noted that Cysouw and Fernandez (2012) dispute Rooryck's assertion that local OLR is ungrammatical in French with a plural first person subject pronoun and singular first person object pronoun, claiming that examples very similar to the one he used to show the ungrammaticality ((37)) are attested online ((42)).

(42) Au passage, nous m'avons achete une baguette magique
'on the way, we bought a wonderful baguette for me'

Since I do not take the appearance of a sentence online to be sufficient evidence for grammaticality, the status of OLR with plural subject pronouns in French will be left undetermined. However, it is a good time to be reminded that throughout the literature there have definitely been claims that for languages other than French, OLR with a plural antecedent can be grammatical. This was one of the grounds on which Berman and Hestvik (1997) rejected Seely's (1993) exhaustive binding theory.

Cysouw and Fernandez (2012) argue that there is indeed a preference for a singular antecedent in sentences with OLR, but that it is simply because "*sentences with singular subject and plural object seem to be more frequent than sentences with plural subject and singular object*" (Cysouw and Fernandez, 2012: 772).

2.1.4. OLR WITH REFLEXIVES

Though generally the topic of OLR has not received a lot of attention in the literature, most of the attention it did receive revolves around the implications of OLR for Principle B. Hardly any attention has been given to languages that express OLR using reflexives. The existence of such languages poses an obvious threat to Principle A (den Dikken et al, 2001). This principle forces a reflexive to be in the same clause with a c-commanding coreferential antecedent, stemming from the notion that reflexives *"have no intrinsic referential content… (and are) assigned reference by an antecedent"* (Chomsky, 1981: 191). In constructions of OLR, it seems that Principle A is not adhered to and the abovementioned notion of reflexives seems not to hold. Although there is no source providing any statistics regarding this matter, it seems that the number of languages that can express OLR with reflexives is not negligible.

One language that uses reflexives for the expression of OLR is Lezgian, a Nakh-Dahestanian language. The only plural reflexive that exists in Lezgian is for third person. It can be used with a singular antecedent as shown in (43). In this example the reflexive and its partial antecedent are not in the same clause, as is possible for Lezgian reflexives in cases of full coreference with an antecedent as well (Haspelmath, 1993: 413).

(43) Ada-z zun čpi-z klig-zawa-j-di aku-na
he-DAT [I.ABS selves-DAT look-IPFV-PTCP-SBST] see-AOR
'He saw that I was looking at themselves (i.e. at him and the others with him)'
(Haspelmath, 1993: 414)

This sort of OLR examples are not at odds with Principle A, since they involve a long distance reflexive, i.e. a reflexive that does not adhere to Principle A anyway. However, there are also examples of non-long-distance reflexives that can be used to express OLR.

One such example is Hausa, a Chadic language. The reflexives in Hausa are made from the word kái ('head'), a linker morpheme –n- and a bound possessive pronoun (Jaggar, 2001: 381). They must be in the same clause as their antecedent (Jaggar,

2001: 384), that is, they are subject to Principle A. Yet surprisingly, a plural reflexive can have a partially overlapping singular antecedent ((44)).

(44) a. nā sō kân-mù à wannàn hōtō
1SG.PFV like head-1PL in this photo
'I like ourselves in this photo'
b. kā bā wà kân-kù kunyā
2M.PFV give to head-2PL shame
'you shamed yourselves'
c. yā tàimàki kân-sù
3M.PFV help head-3PL
'he helped themselves'
(Jaggar, 2001: 385)

In Hungarian, too, the reflexive form contains a possessive pronoun and a body part ('core') (den Dikken et al, 2001). A plural reflexive can take a singular antecedent ((45a)), but not vice versa ((45b)).

(45) a. én mag-unk-at látom
I core-our-ACC see-1SG.DEF
'I see ourselves'
b. *mi mag-am-at látjuk
we core-my-ACC see-1PL.DEF
'We see myself'

Den Dikken et al (2001) try to solve the difficulty this poses for Principle A by arguing that Hungarian reflexives are syntactically possessed noun phrases (*magunkat*='our core'), and therefore can behave in a manner unsuited for Principle A and appear with a partial antecedent. So this is a peculiarity specific to Hungarian, and Principle A can remain unchanged. There are a few problems with this explanation. First, overlapping reference with reflexives occurs in quite a few languages, not all of which seem to have a reflexive form built using a possessive pronoun (for example, Japanese). Second, if the Hungarian reflexive truly has the syntactic essence of a possessed noun phrase, it should be allowed to engage in long-distance binding (as is the case for possessed noun phrases in English for example – "every child thinks that his mother knows everything"). These reflexives in Hungarian are, however, constrained and cannot appear far away from their antecedent (Rákosi, 2009: 467). We have already seen that the body-part-reflexives in Hausa, which are also

morphologically constructed from a possessive pronoun and a body part, are constrained in the same way and must be in the same clause as their antecedent (Jaggar, 2001: 384). So the morphological build-up of the reflexive can tell us about its diachronic development, but it cannot ensure that the reflexive behave in a certain way. Third, body-part-reflexives do not ensure the availability of overlapping reference. In Yoruba, a language spoken mainly in Nigeria, for example, overlapping reference is impossible with reflexives ((46)).

(46) *Olú fẹ́ràn ara won.
Olu likes body their
'Olu likes themselves'
(Adesola, 2006: 2093)

In addition to these three problems for the claim that Hungarian reflexives can express OLR because they are syntactically possessed noun phrases, a fourth problem has to do with the asymmetry for singular versus plural antecedents. If Hungarian reflexives are possessed noun phrases, there is no reason that they should be able to partly overlap in reference with a singular antecedent while failing to do so with a plural antecedent.

A more promising way to salvage Principle A comes from Madigan and Yamada (2007). "Rescuing" Principle A is not the objective of these authors, but if one is to accept their analysis, it follows that OLR is not at odds with Principle A. They examine several languages, among which Japanese (47) and Mandarin (48), and claim that in these languages, too, OLR is possible with reflexives. This is not very exciting, as both the Japanese reflexive *zibun* and the Mandarin reflexive *ziji* are long-distance-reflexives. The interesting fact is that in these languages, too, OLR is only possible when the subject is singular and the reflexive plural. Madigan and Yamada put forward that there is a universal ban on the opposite situation, that is, OLR between a plural subject and a singular reflexive, stated in (49).

(47) **Japanese**
John-ga zibun-tachi-o hihan-shi-ta
John-NOM self-PL-ACC criticize-do-PST
'John criticized themselves'

(48) **Mandarin**

ta you zai kuanjiang ta-men-ziji la
3SG again at praise 3-PL-self ASPECT
'(s)he is praising themselves again'

(49) **General Principle of Anaphoric Dependencies:**

Any two ordered elements, α…β, existing in anaphoric dependency, must be in a relation such that α is part of β.

They suggest that the ability to express OLR is a property that comes from the plural component of the plural reflexive form. Plural reflexive forms are seen to be comprised of two distinct components: a reflexive component that is atomic (semantically singular), and a plural component that can, in some languages, *"pick up contextually determined referents not included in the antecedent"* (Madigan & Yamada, 2007: 190). Plural components of this type are what enables OLR with a singular antecedent. Hence, in a sentence like the Hungarian example in (50), the plural reflexive form *magunkat* ('ourselves') is comprised from an atomic reflexive combined with a plural element that picks up contextually available individuals as referents. The atomic reflexive is bound by the atomic antecedent *én* ('I'). In the example in (51), the singular reflexive remains unbound, and the sentence is ungrammatical. Crucially, Madigan and Yamada do not allow a member of an index to be a binder, as is done in Seely (1993). If they had, the reflexive in (51) would have been bound as it is c-commanded by an NP that has a member of the index which is coindexed with the reflexive's index.

(50) $én_1$ $magunkat_{(1,2)}$ látom = $én_1$ [$self_1$+PL_2] látom
'I see ourselves'

(51) *$mi_{(1,2)}$ $magamat_1$ látjuk
'We see myself'

So according to this analysis, Principle A is obeyed in that reflexives in grammatical cases of OLR are bound by a fully coreferential antecedent. If this analysis is on the right track, what sets apart languages in which OLR is possible with reflexives and languages in which it is not is some property of the plural component in reflexives. However, it seems that the assumptions of this analysis wind up making a

problematic prediction when we turn to look at sentences with fully coreferential plural reflexives, as in (52). If in such sentences, too, the plural reflexive form is syntactically constructed from an atomic reflexive combined with a plural component (as exemplified in (52a)), then here, too, the atomic reflexive will need to be bound by an atomic (i.e. semantically singular) antecedent. Since there is no singular antecedent available, the sentence should result in ungrammaticality, contrary to fact. The only way to produce a viable antecedent, meaning a semantically singular antecedent, would be through a distributive reading of the predicate, exemplified in (52b). In such a reading the predicate will hold for the entities denoted by *mi* separately, and so the atomic reflexive would be bound by both entities denoted by *mi* separately (I assume that the plural component of the plural reflexive will be vacuous, i.e. will not refer to any entity[5]). This then carries the prediction that reflexive forms capable of taking a partly overlapping antecedent can only be understood distributively when the antecedent is fully coreferential with them. This prediction is not borne out, as we can learn from the Mandarin example in (53). This example shows the same plural reflexive form we have previously seen to allow OLR ((48)), but this time with a fully coreferential antecedent. Huang (2001) reports that a collective reading is possible for (53).

(52) $mi_{(1,2)}$ $magunkat_{(1,2)}$ látjuk
'we see ourselves'
a. $mi_{(1,2)}$ [self+PL] látjuk
b. [λz: z is atomic. z sees (z+PL)](x_1) & [λz: z is atomic. z sees (z+PL)](x_2) =
= x_1 sees (x_1+PL) & x_2 sees (x_2+PL)
'I see myself, and you see yourself'

[5] I assume that the plural component of the plural reflexive is vacuous in (52b), because if it does refer to some entity, we get a particularly strange meaning:

[λz. z sees (z+PL_3)](x_1) & [λz. z sees (z+PL_3)](x_2) =
= x_1 sees (x_1+PL_3) & x_2 sees (x_2+PL_3)
'I see myself and x_3, and you see yourself and x_3'

Under standard assumptions about indexing and assignment functions, X_3 must denote the same entity for both parts of the sentence. Thus possible meanings are 'I see myself and me, and you see yourself and me' or 'I see myself and you, and you see yourself and you'. Though I have not checked with speakers of Hungarian, I would be surprised if either of these meanings is a possible meaning for (52).

(53) tamen you zai kuajiang tamen-ziji le
they again at praise themselves ASP
'they are praising themselves again (collective reading of reflexive possible)'

It seems, then, that Madigan and Yamada would have to resort to saying that plural reflexive forms are constructed from an atomic reflexive and a plural component when they participate in OLR, but not when they participate in full coreference. This makes the analysis much less appealing. I will suggest a revised version of this analysis in section 3.2.5.

2.1.5. EVIDENCE FOR COMPETITION: THE CASE OF HUNGARIAN OLR

Hungarian is interesting not only because its reflexives can participate in OLR, but also because it seems to show a complementary distribution between pronouns and reflexives in the expression of OLR (den Dikken et al, 2001). We have already seen that Hungarian can express OLR with reflexives, but only with a singular subject ((54a,b)). Hungarian is also constrained in that the plural first person reflexive cannot overlap in reference with a third person singular subject ((55)). Pronouns in Hungarian show the exact opposite pattern: a singular pronoun can overlap in reference with a plural antecedent (56a), both first person plural pronouns cannot overlap in reference with a singular first person subject (56b), and the plural first person pronouns can overlap in reference with a third person singular subject (56c).

(54) a. én magunkat látom
I ourselves-ACC see-1SG.DEF
'I see ourselves'
b. *mi magamat látjuk
we myself-ACC see-1PL.DEF
'We see myself'

(55) * ő magunkat látja
(s)he ourselves-ACC see-3SG.DEF
'(s)he saw ourselves'

(56) a. mi engem választunk meg
we me elect-1PL.INDEF PV
'we elect me'

b. *én minket/bennünket választok meg
I us/us elect-1SG.INDEF PV
'I elect us'
c. ő minket/bennünket választ meg
(s)he us/us elect-3SG.INDEF PV
'she elects us'
(den Dikken et al, 2001)

To account for the fact that singular object pronouns can overlap in reference with a plural subject, while the opposite is ungrammatical, den Dikken et al suggest that plural pronouns in Hungarian have a syntactically complex structure ((57)). This structure contains an embedded first person singular element, *pro*.

(57) $[_{NP}$ 'we'/'us' $[_{SC}$ pro_{1SG} $[_{PP}$ COMIT [*x* (& *y* (& *z* ...))]]]]

Notice that this strategy is very similar to the one employed by Rooryck (2006). However, while Rooryck wanted to account for the fact that in French OLR can appear between a singular subject and a plural object pronoun but not between a plural subject and a singular object pronoun, den Dikken et al want to derive the complete opposite. They want an analysis that will enable OLR with a singular object pronoun, but not with a plural object pronoun.

Remember that my criticism of Rooryck's analysis was that it winds up predicting that OLR with a singular object pronoun should be grammatical, since the singular first person component is too embedded within his complex structure for plural first person forms and thus does not c-command the object. This is exactly how den Dikken et al derive the fact that Hungarian singular first person pronouns can overlap in reference with a first person plural subject ((58)). Since *pro* does not c-command the object pronoun, no Principle B violation arises.

(58) $[_{NP}$ 'we' $[_{SC}$ pro_1 $[_{PP}$ COMIT [x (& y (& z ...))]]]]] see/represent/elect me_1

However, in the opposite situation, i.e. when the antecedent is singular and the first person object pronoun plural, there is a Principle B violation because *pro* is c-commanded by the coindexed subject.

(59) *I_1 see/represent/elect $[_{NP}$ 'us' $[_{SC}$ pro_1 $[_{PP}$ COMIT [x (& y (& z...))]]]]]

So the assumption about a complex syntactic representation for plural first person pronouns manages to account for the facts correctly.

Den Dikken et al note that there is a detail that hinders the perfect picture of complementarity between pronouns and reflexives in the expression of OLR. In Hungarian, verbs are marked according to the definiteness or indefiniteness of their objects. While reflexive objects induce definite agreement, first and second person pronoun objects induce indefinite agreement. There is a variation of (56b) that some speakers find acceptable, where the agreement on the verb is definite, despite the object being a first person pronoun ((60)).

(60) ?én minket/bennünket választom meg
I us/us represent-1PL.def PV

The authors suggest that the irregular agreement on the verb is an indication that the plural pronoun has moved, either to a non-argument position or to an embedded position within the direct object, leaving the direct object to be headed by a null demonstrative. The result of this movement is that there is no longer a Principle B violation, either because the subject does not c-command *pro* or because the plural pronoun is embedded within the DP headed by a null demonstrative, having this DP serve as the binding domain for *pro*.

Note that den Dikken et al's analysis revolves around the attempt to avoid violations of the classic Principle B, i.e. the principle that is seen as independent. In looking at this data, however, Safir (2004) suggests that the explanation lies in a competition approach. Whenever a meaning cannot be represented using reflexives, a pronoun is a grammatical form for expressing it. We have seen that across languages singular reflexives cannot, for some reason, overlap in reference with a plural antecedent. According to a competition theory it is not at all surprising that pronouns can enter the void and allow expression of this meaning. Safir argues that the marginal availability of (60) is explainable within a competition approach without having to turn to complex syntactic representations, so long as (60) and the corresponding sentence with a reflexive do not convey the same meaning. If the use of a reflexive

leaves unexpressed a certain meaning, then of course the pronoun will not have a competitor for the expression of that meaning. A footnote in the paper implies that indeed a use of a pronoun would convey a different meaning than the use of a reflexive: "*The pronoun will typically identify a group without individuating its members while the anaphor will be used if the speaker knows all the people who make up the group*"(den Dikken et al, 2001: footnote 2).

2.2. LOGICAL OPTIONS FOR THE ANALYSIS OF OVERLAPPING REFERENCE AND THEIR PREDICTIONS

After reviewing all the major theoretical and empirical claims from the literature in section 2.1, I now turn to sum up the possible answers for pertinent questions about the nature of OLR. In order to lay the groundwork for section 3, in which I report empirical findings from a grammaticality judgments study that I conducted in Hebrew, in the current section I consider what bearing possible empirical findings will have for each question.

2.2.1. DOES THE GRAMMATICALITY OF OLR DEPEND ON THE BINDING PRINCIPLES?

Cysouw and Fernandez (2012) suggest that sentences with OLR are judged as being "weird" not because they are violating a grammatical ban, but rather because they describe situations that are infrequent in the world, hence these expressions are also infrequent, and this infrequency leads to speakers' sensation that the sentences are strange. If they are right, grammaticality judgments for sentences with OLR should be the same regardless of the distance between the pronoun and the antecedent.

However, if we find that local OLR is significantly more degraded than OLR across embedding (i.e OLR between an antecedent in a matrix clause and a pronoun in an embedded clause), this would signal that OLR displays locality effects akin to those visible in binding violations. Importantly, such locality effects are expected to be present even if Principle B does not enforce disjoint reference; A semantic non-

coreference Condition B would also display locality effects, as local OLR with a distributive interpretation will be ungrammatical.

2.2.2. DOES PRINCIPLE B ENFORCE DISJOINT REFERENCE?

If Principle B enforces disjoint reference between a pronoun and a c-commanding local antecedent, as Lasnik (1976) suggests, then local OLR should always be ungrammatical for pronouns.

Seely's (1993) theory of exhaustive binding dictates disjoint reference only in certain conditions. As originally stated it rules out any occurrence of OLR, but if it is amended as suggested in section 1.2 then its predictions become more subtle. Its revised version predicts that a plural pronoun would be able to overlap in reference with a singular antecedent, but that OLR between a plural antecedent and a singular pronoun would result in ungrammaticality.

For both Lasnik and Seely, the interpretation of the predicate should not matter. Both OLR with a collective interpretation and a distributive interpretation should be judged the same, as in both cases there is a local c-commanding antecedent ((61), (62a)).

(61) $We_{(1,2)}$ elected me_1

(62) a. $We_{(1,2)}$ voted for me_1

b. I_1 voted for me_1 & X_2 voted for me_1

For a theory in which Principle B is a syntactic principle that only enforces non-coreference between a pronoun and an antecedent, OLR should never be deemed ungrammatical. However, R&R suggest a non-coreference Condition B which is not a syntactic but rather a semantic condition. As such, it holds at some semantic level of the derivation. R&R argue that in cases of a distributive interpretation, this semantic level differs from the syntactic one by containing a conjunction of predicates holding on atomic entities, as in (62b). In this semantic level, there is illicit coreference between a pronoun and a coargument. So their theory predicts that local OLR should

be ungrammatical only when the interpretation is distributive.

2.2.3. INDEPENDENT PRINCIPLE B OR COMPETITION WITH REFLEXIVES?

The question whether the distribution of pronouns is derived from a competition with reflexives or from an independent principle is related to the question whether the grammar enforces disjoint reference for pronouns or not. If the answer to the latter question is positive, i.e. that the grammar does enforce disjoint reference between a pronoun and a local antecedent, this fact would be incompatible with the idea that the distribution of pronouns is derived from a competition with reflexives when we take into account languages like Hebrew or English. In such languages, reflexives cannot partly overlap in reference with their antecedent, and so if the restrictions on the distribution of pronouns arise from a competition with reflexives, there is no reason why a pronoun should not be able to partly overlap in reference with an antecedent. Since reflexives cannot be used to express OLR, pronouns should be able to.

On the other hand, if the grammar enforces solely non-coreference between a pronoun and an antecedent, then it very well might be that the distribution of pronouns is derived from that of reflexives: since reflexives can be used to express coreference with a local antecedent, pronouns cannot be used for that purpose; since reflexives in languages like Hebrew cannot be used to express OLR, pronouns can be used for that purpose.

A competition theory like Safir's (2004) theory depicted in section 1.1.2 argues that for a given derivation, different forms that can appear in the same syntactic position and deliver the same meaning are compared. The grammar then picks out the most preferable form out of the ones available, making the use of other forms ungrammatical. Reflexives are the preferable forms when it comes to the expression of full coreference, but Safir's version of Principle A makes them unavailable for the expression of OLR. With them being unavailable, the form next in line becomes the preferable one, a pronoun. So naively, the prediction of a competition theory should

be that local OLR with a pronoun is always acceptable (we will soon see that this is not exactly Safir's prediction).

Even if the grammar only enforces non-coreference for pronouns, this could still be the result of an independent constraint on pronouns. This is the situation in R&R's system. We have already seen that they predict that local OLR with a pronoun should be grammatical if the interpretation is collective, and ungrammatical if the interpretation is distributive.

Safir's theory would actually predict that the interpretation should matter as well. Safir suggests that some cases where both reflexives and pronouns are unacceptable are due to the independent Coargument Dependency Constraint previously discussed in section 1.1.2. This constraint says that a pronoun/reflexive whose reference depends on a distributively-interpreted-antecedent must depend on each atom of the distributively-interpreted-antecedent in the same way. Therefore, according to Safir, even if reflexives are unacceptable with OLR in a certain language, this should not make pronouns automatically acceptable for all occurrences of OLR in that language. When there is an instance of OLR in which a plural subject pronoun is interpreted distributively, the Coargument Dependency Constraint rules out the ability of a coargument singular pronoun to be partially bound by the subject. Hence, Safir expects that all occurrences of OLR with a plural distributive antecedent should be ungrammatical. As for occurrences of OLR between a singular antecedent and a plural distributive pronoun, Safir's theory predicts that these should be grammatical if there is not a more preferable form that can serve to express the same meaning.

So in sum, for languages like Hebrew in which OLR with reflexives is ungrammatical, this is how R&R's and Safir's predictions diverge: while R&R predict ungrammaticality for all occurrences of OLR with a distributively-interpreted plural pronoun, Safir predicts ungrammaticality only if the plural pronoun is the antecedent.

2.2.4. WHY IS OVERLAPPING REFERENCE GOOD WITH REFLEXIVES IN SOME LANGUAGES?

In section 2.1.4 we saw that surprisingly, in some languages it is grammatical for reflexives to have an antecedent whose reference only partially overlaps with theirs. Crucially, Hebrew is not one of these languages. However, Hebrew can still shed light on this issue. We have seen that Madigan and Yamada (2007) formed a theory that helps maintain Principle A, and this theory predicts that it should not be possible for OLR with reflexives to occur when the antecedent is plural and the reflexive singular. Their explanation for the availability of reflexive-OLR with a singular antecedent in some languages is that in these languages the plural reflexives are structurally complex, comprised from an atomic reflexive alongside a plural component that is able to pick out contextually available referents. In cases of OLR between a plural reflexive and a singular subject, the atomic reflexive within the complex structure of the plural form is fully coreferential with the subject of the sentence, and thus there is no need to revise Principle A to capture these facts.

However, we have also seen that the same asymmetry visible with reflexive-OLR is also claimed for pronoun-OLR, i.e. some have claimed that pronoun-OLR is also less grammatical with a plural antecedent than with a singular antecedent. Cysouw and Fernandez (2012) suggest that this asymmetry is not driven by any syntactic principle. If indeed there is some preference for a singular antecedent in pronoun-OLR that is not related to the binding conditions at all, this immediately raises the suspicion that the asymmetry we see in reflexive-OLR is driven by the same non-syntactic factor. If it is, and in fact there is no syntactic problem with reflexive-OLR with a plural antecedent, then as far as the syntax is concerned examples like (63) are fine and they are only judged to be bad because of a non-syntactic factor.

(63) *$mi_{(1,2)}$ $magamat_1$ látjuk
we myself-ACC see-1PL.DEF
'We see myself'

Such examples cannot be accounted for whilst keeping Principle A as is, because the reflexive does not have a coreferential antecedent. If the binding system allows for

such examples, then this means that Principle A should be amended to allow binding of the reflexive by a member of the index of a c-commanding NP.

If indeed the binding restrictions on reflexives allow a reflexive to be bound by a member of the index of a c-commanding NP, then this should apply to Hebrew as well. Remember, we are not expecting such examples to be judged as flawless. We know that there is definitely something wrong with them, we just don't know whether it is syntactic, non-syntactic, or perhaps even both. If the effect dragging down judgments for such sentences is the same non-syntactic effect that is active in pronoun-OLR, then we should expect reflexive-OLR with a plural antecedent to not be judged worse than pronoun-OLR with a plural antecedent.

If the finding will be that reflexive-OLR with a plural antecedent is judged worse than pronoun-OLR with a plural antecedent, then we can conclude that there is more than just a non-syntactic factor at play for these reflexive-OLR cases, because a non-syntactic factor should affect pronoun-OLR and reflexive-OLR in the same way. This would imply that Principle A should be kept as is, i.e. that it is not the case that the binding system allows a reflexive to be bound by a member of the index of a c-commanding NP, but rather the requirement is that the antecedent be wholly coindexed with the reflexive.

3. GRAMMATICALITY JUDGMENTS STUDY

The literature on OLR is scarce and consists mainly of anecdotal examples. No systematic evaluation of the factors governing the well-formedness of OLR has been conducted. Some factors have been suggested to be of importance, but largely on the grounds of one or two examples, and sometimes with different linguists disagreeing on the judgments.

In order to draw conclusions from the phenomenon of OLR regarding the binding conditions, one must, of course, be clear on the empirical state of affairs. For this reason, I embarked on an empirical exploration in order to understand what the facts actually are. To do this, I conducted a grammaticality judgments study, where participants had to grade the grammaticality of sentences on a 7 point scale.

3.1. THE QUESTIONNAIRES

40 sentences were constructed in Hebrew, varying in antecedent number (singular versus plural), interpretation (distributive versus collective), and distance from antecedent (local, ECM or embedding). In order to avoid insertion of an additional variable and possibly of added noise, I limited my investigation to first person OLR. Since it has been suggested in the literature that OLR might not be equally acceptable across all persons, the results of this study must be interpreted with caution.

Each of the 40 sentences was tested in three variations: OLR with a pronoun, OLR with a reflexive and disjoint reference. An exception to this was the sentences that contained OLR across embedding, which were not tested with reflexives.

Due to the large number of sentences, I divided the sentences to two separate questionnaires. The first questionnaire contained OLR with pronouns and OLR with reflexives, and the second contained the disjoint reference sentences.

3.1.1. OLR QUESTIONNAIRE

The first questionnaire contained 70 sentences with OLR, and 15 filler sentences. The OLR sentences varied along the following parameters:

a. Subject number (singular / plural)

b. Type of object (pronoun / reflexive)

c. Distance from antecedent (embedding / ECM / local)

d. Interpretation (distributive / collective)

20 sentences contained local OLR with a pronoun, half of which had a singular subject and half had a plural subject. Half of the sentences with a singular antecedent had a distributive interpretation and half a collective interpretation, and the same holds for the sentences with a plural antecedent.

10 additional sentences were ECM sentences that contained OLR with a pronoun, such that the antecedent was in the matrix clause. The antecedent was singular in half of these sentences and plural in the other half.

10 additional sentences contained OLR with a pronoun across embedding, such that the antecedent was in the matrix clause and the pronoun in the embedded clause. Here, too, half of the sentences were with a singular antecedent and the other half with a plural antecedent.

Finally, 30 sentences were identical to the sentences with ECM and local OLR, except that they contained a reflexive instead of a pronoun. This means that the type of bound element was a within-subject factor. So in effect participants answering this questionnaire had to rate the same sentence twice – once with a pronoun and once with a reflexive. This was done in order to assess whether there is a correlation between the score a participant gives to a sentence with pronoun OLR and the score that participant gives to that same sentence with reflexive OLR. A reverse correlation would mean that the better the reflexive is rated – the worse the pronoun is rated,

which would point to them being assessed one with respect to the other, i.e to them being in competition.

In order to ensure a collective or a distributive interpretation, I made use of markers of distributivity or collectivity. The markers are exemplified with the sentences below, all of which were part of the questionnaire. Sentences (64-66) contain a distributive marker, and sentences (67-68) contain a collective marker.

(64) hecbanu li exad exad
voted.1PL for-me one one
'we voted for me one by one'
(65) iparti otano axat axrey ha-ŝniya
applied-makeup.1SG us.ACC one after the-other
'I did our makeup one after the other'
(66) cilamnu oti be-torot
photographed.1PL me in-turns
'we took turns photographing me'
(67) raŝamti otanu la-taxarut ke-kvoca
enrolled.1SG us to-the-competition as-group
'I enrolled us to the competition as a group'
(68) hexanu oti la-olimpiada beyaxad
prepared.1PL me to-the-Olympics together
'we prepared me for the Olympics together'

Some sentences depicted situations that are heavily tilted towards a distributive or a collective interpretation, and in such cases I did not make use of markers. For example, the sentence in (69) naturally calls for a distributive interpretation, as pinching is a physical action that can only be operated on people separately. The sentence in (70) depicts the outcome of an election and thus is naturally interpreted as collective.

(69) cavateti otanu
pinched.1SG us
'I pinched us'
(70) baxarnu oti be-rov ŝel asara kolot
elected.1PL me in-majority of ten votes
'we elected me by a majority of ten votes'

Table 1 below sums up the number of sentences for every combination of factors and gives one example of each type of sentence. The full list of sentences used can be found in appendix 1.

TABLE 1: THE CONFIGURATION OF QUESTIONNAIRE 1

	Singular antecedent	Plural antecedent
Local distributive with a pronoun	5 sentences. Example: he'eracti otano axat axat admired.1SG us one one 'I admired each of us'	5 sentences. Example: he'eracno oti exad exad admired.1PL me one one 'Each of us admired me'
Local distributive with a reflexive	5 sentences. Example: he'eracti et acmenu axat axat admired.1SG ourselves one one 'I admired each of ourselves'	5 sentences. Example: he'eracno et acmi exad exad admired.1PL myself one one 'Each of us admired myself'
Local collective with a pronoun	5 sentences. Example: kibacti otanu beyaxad grouped.1SG us together 'I grouped us together'	5 sentences. Example: beyaxad he'evarnu oti le-misrad axer together moved.1PL me to-office other 'Together we moved me to another office'
Local collective with a reflexive	5 sentences. Example: kibacti et acmenu beyaxad grouped.1SG ourselves together 'I grouped ourselves together'	5 sentences. Example: beyaxad he'evarnu et acmi le-misrad axer together moved.1PL myself to-office other 'Together we moved myself to another office'
ECM with a pronoun	5 sentences. Example: ŝamati otanu ŝarim heard.1SG us singing 'I heard us singing'	5 sentences. Example: ra'inu oti me'abed ŝlita saw.1PL me lose control 'we saw me lose control'
ECM with a reflexive	5 sentences. Example: ŝamati et acmenu ŝarim heard.1SG ourselves singing 'I heard ourselves singing'	5 sentences. Example: ra'inu et acmi me'abed ŝlita saw.1PL myself lose control 'we saw myself lose control'
Embedding with a pronoun	5 sentences. Example: kiviti ŝe-anaxnu mo'amadim la-pras hope.1sg that-we nominees for the-prize 'I hoped that we are nominated for the prize'	5 sentences. Example: xaŝavnu ŝe-ani anace'ax thought.1PL that-I will win 'we thought that I will win'

In addition to the 70 OLR sentences, 15 filler sentences were also used. These were sentences with either disjoint reference or full coreference. One filler item was constructed to be unquestionably ungrammatical in order to screen for participants who reversed the scale or did not understand the task. This filler contained an intransitive verb along with an object ((71)). The rest of the fillers varied in their level of grammaticality.

(71) *hitxaŝmalti otxa
was_electrocuted.1SG.HITPA'EL you.ACC

The questionnaire was administered via Google Forms. The sentences were divided between 5 consecutive screens, each of them featuring 17 sentences one below the other. Each screen contained one sentence from each cell in table 1 (14 OLR sentences overall), plus three filler sentences. The makeup of each screen was determined so as to ensure that participants will never see the same sentence twice, once with a pronoun and once with a reflexive, in the same screen. The order of sentences within each screen was automatically randomized for each participant.

Participants were instructed to rate the sentences according to how "good" they sound in Hebrew if heard in a suitable context. It was highlighted in the instructions that the task is not to determine the likelihood that a sentence will be uttered, but just whether it sounds good to them as speakers of Hebrew. The full instructions in Hebrew, along with their translation to English, can be found in appendix 1.

The participants were my family members and friends. 41 native Hebrew speakers responded to the first questionnaire. 14 of them responded to an early version of the questionnaire where only pronoun-OLR appeared. The responses of one participant were left out of the analysis, as this participant was the only one to rate the filler in (71) with 4 out of 7, suggesting that this participant's use of the scale was anomalous. Participants were asked about their age. Responses varied between 21 and 58, with an average age of 30.

3.1.2. DISJOINT REFERENCE QUESTIONNAIRE

The second questionnaire contained the disjoint reference sentences. These were the same sentences that were presented with OLR in the first questionnaire, except that the partially bound first person pronoun was altered to a third person pronoun to create disjoint reference. For example, the sentence in (72) was part of the first questionnaire and contains OLR. Its correlate in the second questionnaire was the sentence in (73) where instead of OLR there is disjoint reference.

(72) ŝamati otanu ŝarim
heard.1SG us singing
'I heard us singing'
(73) ŝamati otam ŝarim
heard.1SG them singing
'I heard them singing'

The questionnaire contained 40 critical items, divided according to the factors in table 2. The full list of sentences can be found in appendix 1.

TABLE 2: THE CONFIGURATION OF QUESTIONNAIRE 2

	Singular subject	Plural subject
Local distributive	5 sentences. Example: he'eracti otan axat axat admired.1SG them one one 'I admired them one by one'	5 sentences. Example: he'eracno ota exad exad admired.1PL her one one 'Each of us admired her'
Local collective	5 sentences. Example: kibacti otam beyaxad grouped.1SG them together 'I grouped them together'	5 sentences. Example: beyaxad he'evarnu oto le-misrad axer together moved.1PL him to-office other 'Together we moved him to another office'
ECM	5 sentences. Example: ŝamati otam ŝarim heard.1SG them singing 'I heard them singing'	5 sentences. Example: ra'inu oto me'abed ŝlita saw.1PL him lose control 'we saw him lose control'
Embedding	5 sentences. Example: kiviti ŝe-hem mo'amadim la-pras hope.1sg that-they nominees for the-prize 'I hoped that they are nominated for the prize'	5 sentences. Example: xaŝavnu ŝe-hi tenace'ax thought.1PL that-she will win 'we thought that she will win'

In addition to the critical items, there were 20 filler sentences. In order to mask the purpose of the questionnaire, most fillers contained exceptive phrases such as "xuc me-" ("except for"). One filler item was constructed to be unquestionably ungrammatical in order to screen for participants who reversed the scale or did not understand the task. This filler contained an intransitive verb along with an object ((74)). The rest of the fillers varied in their level of grammaticality.

(74) *hu histarek et acmu
he combed.HITPA'EL himself.ACC

The questionnaire was administered via Google Forms. The sentences were divided between 5 consecutive screens, each of them featuring 14 sentences one below the other. Each screen contained one sentence from each cell in table 2 (10 critical items overall), plus four filler sentences. The order of sentences within each screen was automatically randomized for each participant. The instructions given to participants were identical to the instructions from the OLR questionnaire.

In order to find Hebrew speakers who would participate in this questionnaire I posted a link to it on my Facebook profile. The participants were my Facebook friends and friends of friends. 33 native Hebrew speakers responded to the questionnaire. None of them rated the filler sentence presented in (74) with more than 2 out of 7, and thus no one was excluded from the analysis. In this questionnaire, too, participants were asked about their age. Responses varied between 21 and 57, with 28 being the average age.

3.2. RESULTS

3.2.1. FIRST ANALYSIS: OLR VERSUS DISJOINT REFERENCE

In the first analysis, I examined all of the reflexive-OLR, pronoun-OLR and disjoint reference sentences. In this set of data each sentence appears three times, once with a first person object pronoun that overlaps in reference with the subject ((75)), once with a first person object reflexive that overlaps in reference with the subject

((76)), and once with a third person object whose reference is disjoint from that of the subject ((77)).

(75) he'eracti otano axat axat
admired.1SG us one one
'I admired each of us'
(76) he'eracti et acmenu axat axat
admired.1SG ourselves one one
'I admired each of ourselves'
(77) he'eracti otan axat axat
admired.1SG them one one
'I admired each of them'

Descriptive statistics for the items included in this analysis can be found in table 5 in appendix 2.

A factorial analysis of variance (ANOVA)[6] was conducted to measure the influence of three independent variables (**type of relation**, **distance from antecedent**, **antecedent number**) on the grammaticality ratings given to sentences on a 1-7 scale. **Type of relation** included three levels (reflexive-OLR, pronoun-OLR, disjoint reference), **distance from antecedent** included three levels (local, ECM, embedding) and **antecedent number** consisted of two levels (singular, plural). All main effects and all interactions were statistically significant at the 0.05 significance level.

The main effect for **type of relation** yielded an F ratio of $F(2, 3670) = 1258.63$, $p<0.001$, indicating a significant difference between reflexive-OLR ($M=2.1$, $SD=1.75$), pronoun-OLR ($M=5.43$, $SD=2.08$) and disjoint reference ($M=6.27$, $SD=1.29$). A post hoc Tukey HSD test[7] showed that each of the three levels significantly differed from the other two ($p<0.001$). This tells us that on average sentences with disjoint reference were judged to be near-flawless, while sentences with pronoun-OLR were judged slightly less grammatical than that and sentences with reflexive-OLR were

[6] The SPSS output for the ANOVA can be found in table 6 in appendix 2.
[7] The SPSS output for the post hoc Tukey HSD test for type of relation can be found in table 7 in appendix 2.

rated very low (keep in mind that the grammaticality scale did not contain the rating zero, and so 1 was the minimum rating possible).

The main effect for **distance from antecedent** yielded an F ratio of F(2, 3670) = 136.35, p<0.001, indicating a significant difference between local distance (M=4.45 , SD=2.46), ECM (M=5.04 , SD=2.32) and embedding (M=6.57 , SD=1.02). A post hoc Tukey HSD test[8] showed that each of the three levels significantly differed from the other two (p<0.001). So overall, the bigger the distance was, the better the grammaticality rating was.

The main effect for **antecedent number** yielded an F ratio of F(1, 3670) = 141.59, p<0.001, indicating a significant difference between singular antecedents (M=5.45 , SD=2.2) and plural antecedents (M=4.61 , SD=2.42). This shows that overall there was a dispreference for plural antecedents.

A significant interaction was found between **type of relation** and **distance**, F(3, 3670)= 24.32, p<0.001. Pairwise comparisons with Bonferroni adjustment for multiple comparisons were conducted to assess within which levels of **distance** the levels of **type of relation** significantly differed from one another[9]. In local distance, disjoint reference received significantly higher grammaticality ratings than pronoun-OLR (mean difference=1.22, p<0.001) and reflexive-OLR (mean difference=4.16, p<0.001). Pronoun-OLR received significantly higher ratings than reflexive-OLR (mean difference=2.94, p<0.001). In ECM sentences, disjoint reference received significantly higher ratings than pronoun-OLR (mean difference=0.95, p<0.001) and reflexive-OLR (mean difference=3.9, p<0.001). Pronoun-OLR received significantly higher ratings than reflexive-OLR (mean difference=2.95, p<0.001). In sentences with embedding, grammaticality ratings for disjoint reference and pronoun-OLR did not differ significantly (mean difference=0.01, p>0.9).

[8] The SPSS output for the post hoc Tukey HSD test for distance from antecedent can be found in table 8 in appendix 2.
[9] The SPSS output for this analysis can be found in table 9 in appendix 2.

A significant interaction was found between **type of relation** and **antecedent number**, F(2, 3670)= 46.71, p<0.001. Pairwise comparisons with Bonferroni adjustment for multiple comparisons were conducted to assess within which levels of **type of relation** there was a significant effect to the **antecedent number**[10]. For disjoint reference, grammaticality ratings did not differ significantly for sentences with singular versus plural antecedents (mean difference=0.09, p>0.3). For pronoun-OLR, grammaticality ratings for sentences with singular antecedents were significantly higher than for sentences with plural antecedents (mean difference=1.3, p<0.001). For reflexive-OLR, grammaticality ratings for sentences with singular antecedents were significantly higher than for sentences with plural antecedents (mean difference=0.85, p<0.001). This shows us that the dispreference for a plural antecedent is unique to OLR, but is present both in pronoun-OLR and reflexive-OLR.

A significant interaction was found between **distance** and **antecedent number**, F(2, 3670)= 11.53, p<0.001. Pairwise comparisons with Bonferroni adjustment for multiple comparisons were conducted to assess within which levels of **distance** there was a significant effect to the **antecedent number**[11]. Grammaticality ratings were significantly higher for singular antecedents than for plural antecedents in local distance (mean difference=0.91, p<0.001), ECM (mean difference=0.87, p<0.001) and embedding (mean difference=0.258, p<0.001).

A significant three way interaction was found between **type of relation**, **distance** and **antecedent number**, F(3, 3670)=11.57, p<0.001. Two analyses of pairwise comparisons with Bonferroni adjustment for multiple comparisons were conducted in order to interpret the source for this three way interaction. The first[12] assessed how the levels of **type of relation** differ within each level of **distance** and **antecedent number**. This analysis revealed that grammaticality ratings for disjoint reference were significantly higher than ratings for pronoun-OLR in sentences with local

[10] The SPSS output for this analysis can be found in table 10 in appendix 2.
[11] The SPSS output for this analysis can be found in table 11 in appendix 2.
[12] The SPSS output for this analysis is in table 12 in appendix 2.

distance and singular antecedents (mean difference=0.66, p<0.001), in sentences with local distance and plural antecedents (mean difference=1.77, p<0.001), and in ECM sentences with plural antecedents (mean difference=1.9, p<0.001). Grammaticality judgments for disjoint reference were not significantly higher than ratings for pronoun-OLR in ECM sentences with singular antecedents (mean difference=0, p=1), and in sentences with embedding when the antecedent was singular (mean difference= -0.32, p>0.05) and when the antecedent was plural (mean difference=0.29, p>0.08). Grammaticality ratings for reflexive-OLR were always significantly lower than pronoun-OLR and disjoint reference. The results of this analysis are presented in figure 1.

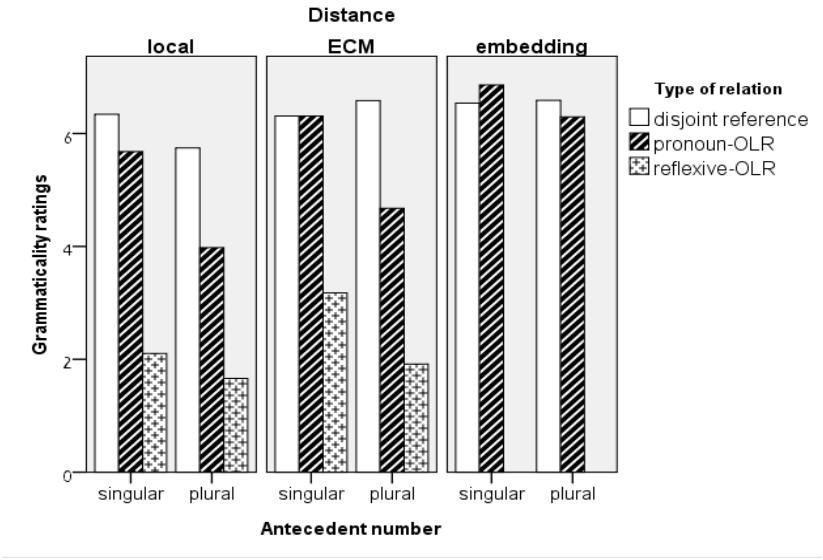


FIGURE 1: GRAMMATICALITY RATINGS FOR DISJOINT REFERENCE, PRONOUN-OLR AND REFLEXIVE-OLR AS A FUNCTION OF DISTANCE FROM ANTECEDENT AND ANTECEDENT NUMBER.

The other analysis of the three way interaction assessed in what levels of **type of relation** and **distance** there was a significant effect for **antecedent number**[13]. This analysis revealed that for disjoint reference, sentences with singular antecedents received higher grammaticality ratings than sentences with plural antecedents only

[13] The SPSS output for this analysis is in table 13 in appendix 2.

in local distance (mean difference=0.6, p<0.001), but not with ECM (mean difference= -0.2, p>0.1) or embedding (mean difference= -0.04, p>0.7). For pronoun-OLR, sentences with singular antecedents received higher grammaticality ratings than sentences with plural antecedents in local distance (mean difference=1.7, p<0.001), ECM (mean difference=1.63, p<0.001) and embedding (mean difference=0.56, p<0.001). For reflexive-OLR, sentences with singular antecedents received higher grammaticality ratings than sentences with plural antecedents in local distance (mean difference=0.44, p<0.003) and ECM (mean difference=1.26, p<0.001).

3.2.2. SECOND ANALYSIS: ZOOMING IN ON LOCAL DISTANCE

In the second analysis, I zoomed in on sentences with local distance in order to evaluate the effect of a distributive versus collective interpretation. Each local sentence was constructed to elicit a clear collective interpretation or a clear distributive interpretation of the plural pronoun/reflexive.

In this set of data, too, each sentence appears three times, once with a first person object pronoun that overlaps in reference with the subject, once with a first person object reflexive that overlaps in reference with the subject, and once with a third person object whose reference is disjoint from that of the subject.

Descriptive statistics for the items included in this analysis can be found in table 14 in appendix 3.

A factorial analysis of variance (ANOVA) was conducted[14] to measure the influence of three independent variables (**type of relation**, **interpretation**, **subject number**) on the grammaticality ratings given to sentences on a 1-7 scale. **Type of relation** included three levels (reflexive-OLR, pronoun-OLR, disjoint reference), **interpretation** included two levels (distributive, collective) and **antecedent number**

[14] The SPSS output for the ANOVA can be found in table 15 in appendix 3.

consisted of two levels (singular, plural). All main effects were statistically significant at the 0.05 significance level. All interactions were statistically significant at the 0.05 significance level beside the interaction between **interpretation** and **antecedent number** that was not statistically significant ($F(1,1954)=0.51$, $p>0.4$).

The main effects for **type of relation** and **antecedent number** are already captured by the results of analysis 1 (specifically, in the analysis of the interaction between **type of relation** and **distance**, and in the analysis of the interaction between **antecedent number** and **distance**, respectfully).

A main effect for **interpretation** was found, $F(1, 1954)=122.39$, $p<0.001$, indicating a significant difference between collective interpretations ($M=4.91$, $SD=2.36$) and distributive interpretations ($M=3.99$, $SD=2.48$).

The significant interaction between **type of relation** and **antecedent number** is already captured in the analysis of the three way interaction in analysis 1.

A significant interaction was found between **type of relation** and **interpretation**, $F(2, 1954)= 18.8$, $p<0.001$. Pairwise comparisons with Bonferroni adjustment for multiple comparisons were conducted to assess the effect of **interpretation** within each level of **type of relation**[15]. Grammaticality ratings were significantly higher for collective interpretations than for distributive interpretations for disjoint reference (mean difference=0.52, $p<0.001$), for pronoun-OLR (mean difference=1.48, $p<0.001$) and for reflexive-OLR (mean difference=0.55, $p<0.001$).

A significant three way interaction was found between **type of relation**, **interpretation** and **antecedent number**, $F(2, 1954)=12.83$, $p<0.001$. This interaction is depicted in figure 2. Pairwise comparisons with Bonferroni adjustment for multiple comparisons were conducted to assess how the levels of **type of relation** differ within each level of **interpretation** and **antecedent number**[16]. Grammaticality

[15]The SPSS output for this analysis can be found in table 16 in appendix 3.
[16] The SPSS output for this analysis can be found in table 17 in appendix 3.

ratings for pronoun-OLR and disjoint reference were not significantly different for sentences with a collective interpretation and a singular antecedent (mean difference=0.23, $p>0.5$). However, ratings for disjoint reference were significantly higher than for pronoun-OLR in sentences with a collective interpretation and a plural antecedent (mean difference=1.74, $p<0.001$). In sentences with a distributive interpretation, disjoint reference was rated significantly higher than pronoun-OLR both when the antecedent was singular (mean difference=1.63, $p<0.001$) and when the antecedent was plural (mean difference=1.8, $p<0.001$). Reflexive-OLR was always rated significantly lower than disjoint reference and pronoun-OLR.

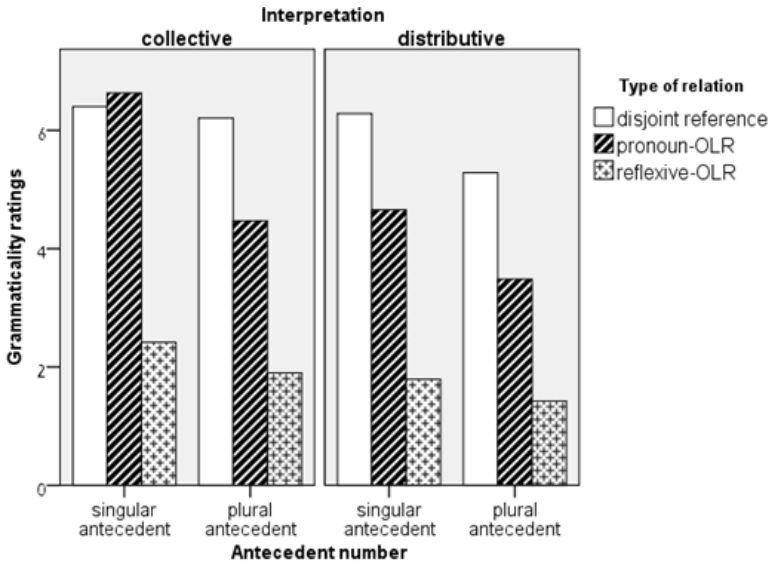


FIGURE 2: GRAMMATICALITY RATINGS FOR DISJOINT REFERENCE, PRONOUN-OLR AND REFLEXIVE-OLR AS A FUNCTION OF THE INTERPRETATION AND THE ANTECEDENT NUMBER.

3.2.3. INTERPRETATION OF THE RESULTS FROM ANALYSES 1 AND 2

The results from the two analyses combined supply information about the influence and interactions of type of relation, antecedent number, distance, and interpretation of sentences with local distance. Figure 3 is a visualization of the data from both analyses together.

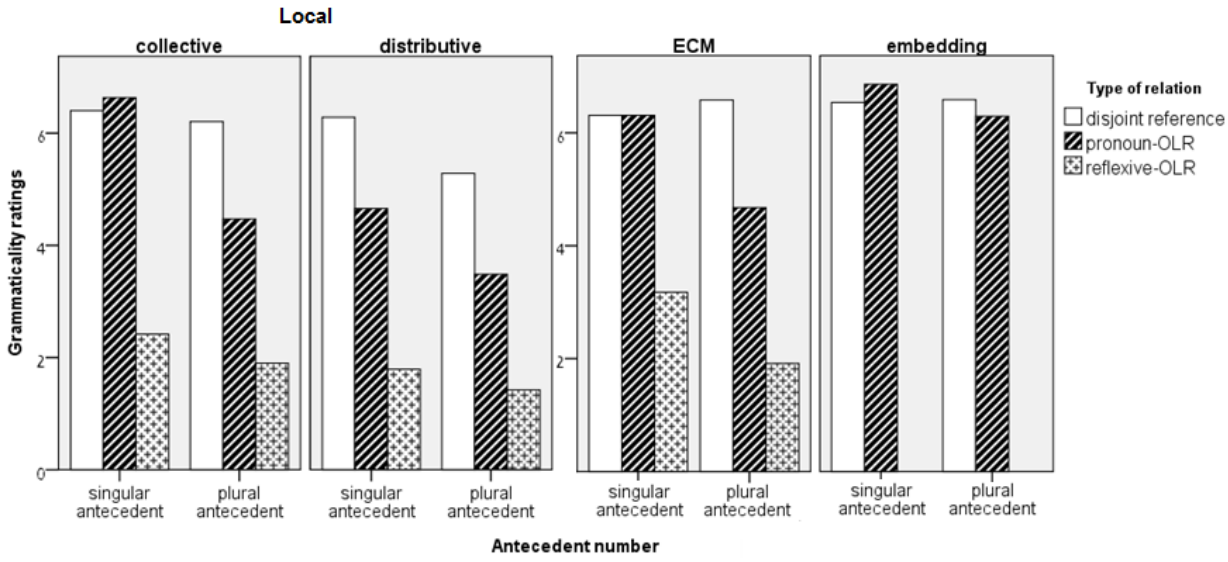


FIGURE 3: VISUALIZATION OF FINDINGS FROM ANALYSIS 1 AND ANALYSIS 2 TOGETHER. GRAMMATICALITY RATINGS FOR DISJOINT REFERENCE, PRONOUN-OLR AND REFLEXIVE-OLR AS A FUNCTION OF DISTANCE AND ANTECEDENT NUMBER, WITH LOCAL DISTANCE DIVIDED ACCORDING TO INTERPRETATION.

3.2.3.1. DISPREFERENCE FOR PLURAL ANTECEDENTS

We can see a dispreference for plural antecedents in a few conditions. With disjoint reference, only local sentences, i.e. transitive sentences with a first person pronoun in subject position and a third person pronoun in object position, display a dispreference for plural antecedents. However, this dispreference always exists in sentences with OLR, no matter the distance, the interpretation, or whether it is pronoun-OLR or reflexive-OLR. I take this to mean that Cysouw and Fernandez (2012) are partly right in their claims about this dispreference. They claim that this dispreference exists in OLR just as it exists in language in general. We do see a sign that this is a general dispreference, as it also shows up in local disjoint reference sentences. However, in OLR sentences this dispreference shows up across all distances, so for some reason it is definitely more pronounced in OLR. This dispreference is clearly not related to the binding conditions, since we see it in pronoun-OLR across embedding, and we know that pronouns bound across embedding do not create binding violations.

3.2.3.2. THE GRAMMATICALITY OF LOCAL PRONOUN-OLR DEPENDS ON THE INTERPRETATION

Sentences with collective interpretations were always graded higher than sentences with distributive interpretations. However, the mean difference between collective and distributive sentences was three times higher in pronoun-OLR than in disjoint reference or reflexive-OLR. This means that the interpretation plays a crucial role in pronoun-OLR. We can get a better understanding of this role when we look at the difference between disjoint reference and pronoun-OLR in collective versus distributive interpretations. Since we have just established in section 3.2.3.1 that there is a non-binding-related dispreference for plural antecedents in sentences with OLR, I will base my conclusions regarding binding violations solely on sentences with a singular antecedent. When we look at sentences with a singular antecedent, we can see that for collective interpretations there is no significant difference between the grammaticality ratings given for disjoint reference and for pronoun-OLR. But with distributive interpretations, disjoint reference was rated significantly higher than pronoun-OLR. This is exactly what is predicted by R&R's semantic Condition B. Remember that this condition rules out coreference between a pronoun and a coargument, and applies "*at the relevant semantic level*". In the case of a distributive interpretation, the relevant semantic level is one that contains a reflexive predicate where the pronoun is coindexed with a coargument, and hence there is a violation of Condition B for distributive interpretations.

Remember that in Safir's competition theory, the distribution of pronouns is regulated by the FTIP, repeated here as (78).

(78) **Form-to-Interpretation Principle (FTIP)**:

> If x c-commands position y, and form z is not the most dependent form available in position y with respect to x, then y cannot be directly dependent on x (the value of the content of y cannot be a function of the value of x)

According to this principle, pronouns should be acceptable in case a reflexive form is unavailable. Since reflexives cannot be used for OLR in Hebrew, pronouns should be

able to do so. However, there are certain environments where both forms are expected to be ungrammatical due to an independent constraint. Such an independent constraint is the Coargument Dependency Constraint, repeated below as (79).

(79) **Coargument Dependency Constraint:** If A is identity dependent on B and A and B are coarguments, then for any distributed interpretation of B, A depends on every distributed atom of B in the same way.

This constraint makes OLR ungrammatical with a distributive interpretation, but only when the antecedent is plural. But as the results show, OLR is rated significantly lower than disjoint reference when the antecedent is singular as well, which is unexpected given Safir's FTIP and Coargument Dependency Constraint. Since the Coargument Dependency Constraint only rules out OLR with a distributive interpretation and a plural antecedent, cases in which the antecedent is singular are regulated by the FTIP. The FTIP, in turn, also fails to rule out OLR with a distributive interpretation and a singular antecedent. Since reflexives in Hebrew cannot be used to express such meanings, pronouns should be able to. And so the results are not compatible with Safir's theory. This, however, is not a substantial flaw in Safir's theory, as the Coargument Dependency Constraint could be revised as follows:

(80) **Revised Coargument Dependency Constraint:**

If A is identity dependent on B and A and B are coarguments, then:

a. for any distributed interpretation of B, A depends on every distributed atom of B in the same way.

b. for any distributed interpretation of A, every distributed atom of A depends on B in the same way.

The revised Coargument Dependency Constraint predicts reduced grammaticality for pronoun-OLR with a distributive interpretation, no matter the number of the antecedent. So with this revision in place, the facts do not yet necessarily point to the correctness of one of these two theories over the other. However, the results do point to the incorrectness of Lasnik's (1976) and Seely's (1993) theories, because, as

discussed in section 2.2.2, their theories do not predict that the interpretation should affect the grammaticality. The fact that local pronoun-OLR is grammatical (i.e. is not judged significantly worse than disjoint reference) when the interpretation is collective indicates that the binding system does not enforce disjoint reference between a pronoun and a local antecedent.

3.2.3.3. THE GRAMMATICALITY OF PRONOUN-OLR DEPENDS ON THE DISTANCE FROM THE ANTECEDENT

In the previous section we have seen that both R&R's and Safir's theories are compatible with the data (with a small revision to Safir's Coargument Dependency Constraint). When we turn to look at the difference between disjoint reference and pronoun-OLR in the different levels of distance, both theories again make the right predictions.

First of all, as expected by both theories, pronoun-OLR across embedding is not rated significantly different than disjoint reference. This strengthens the idea that there is nothing generally wrong with pronoun-OLR, and it is only rated less grammatical in environments that produce binding violations.

As it was previously established that plural antecedents reduce judgments for OLR for non-binding-related reasons, when we turn to look at ECM I will focus only on sentences with a singular antecedent. In ECM sentences with a singular antecedent there is no significant difference between the grammaticality ratings given to disjoint reference and to pronoun-OLR.

This is expected by R&R's theory, as their semantic Condition B only applies to coarguments. In their theory, coreference between a pronoun and a non-coargument antecedent is ruled out by a syntactic rule, the chain condition repeated below as (81).

(81) a. **Definition of a chain**:

(α^1,..., α^n), 1 ≤ n, is a chain iff

(i) every α has the same subscript, i.e $(\alpha^1,..., \alpha^n) = (\alpha_j^1,..., \alpha_j^n)$
(ii) for every i < n, α^i governs α^{i+1}
b. **General condition on A-chains**: a maximal A-chain $(\alpha_1, \ldots, \alpha_n)$ contains exactly one link, α_1, that is both [+R] and Case-marked.
c. An element is [+R] if it is fully specified for number, case and gender.

This rule is defined as a non-coreference rule and not a disjoint reference rule, since a chain is only formed for elements "*with the same subscript*", that is with the same index. In cases of OLR, the indices of the pronoun and the antecedent are not identical, hence no chain is formed and the chain condition is trivially satisfied.

Safir's theory, too, predicts that there should not be a binding violation for pronoun-OLR in ECM sentences. The FTIP principle is satisfied in such cases, because since reflexives cannot be used with a partial antecedent, pronouns are the most dependent form available.

3.2.4. THIRD ANALYSIS: COMPETITION OR INDEPENDENT PRINCIPLE B?

So far, the results from the previous analyses were able to rule out theories in which there is a syntactic requirement for disjoint reference between a pronoun and a local antecedent. We are now left with two theories that might be a true characterization of the state of affairs: R&R's independent semantic Condition B and Safir's competition theory.

The previous analyses showed that overall pronoun-OLR is rated as significantly more grammatical than reflexive-OLR, and that this remains true in every condition (i.e. whether the distance is local or ECM, the antecedent plural or singular and the interpretation distributive or collective). This result is compatible with both R&R's theory and Safir's theory. In order to choose between the theories, I ran a different type of analysis that is designed specifically to attend to this issue.

In the OLR questionnaire, each participant had to grade the grammaticality of each OLR sentence twice – once with an object pronoun and once with a reflexive. For the third analysis, I created pairs of scores consisting of the score a participant gave to a

sentence with a reflexive, and the score that same participant gave to that same sentence with a pronoun. I ran a simple linear regression on these pairs of scores. The previous analyses could only say something general about the relation between pronoun-OLR and reflexive-OLR, i.e. which of them is generally rated higher, since they took into account scores given to different sentences by different participants. However, the current analysis keeps constant everything except for whether a pronoun or a reflexive is used. That is, the current analysis revolves around how this minimal change of changing a reflexive into a pronoun, while keeping everything else constant, effects the ratings that a participant will give to the sentence. So basically instead of analyzing the relation between pronoun-OLR and reflexive-OLR across sentences, as in analyses 1 and 2, the current analysis analyzes the relation between pronouns and reflexives within a given sentence and a given participant. Since everything else is kept constant, analyzing the pairs of score-given-to-reflexive and score-given-to-pronoun can tell us whether the score-given-to-pronoun is predictable by the score-given-to-reflexive.

A competition theory predicts that we shall find a negative correlation, so that the lower the grammaticality rating is for reflexive-OLR in a given sentence, the higher the grammaticality rating for pronoun-OLR in that same sentence.

A simple linear regression was calculated to predict the grammaticality ratings a participant gives to pronoun-OLR, based on the grammaticality ratings given by the same participant to the same sentence with reflexive-OLR. A significant regression equation was found ($F(1,778)= 72.51$, $p<0.001$), with an R^2 of 0.085, Pearson correlation of 0.29. Pronoun-OLR predicted grammaticality ratings are equal to 4.54 + 0.35 grammaticality ratings for reflexive-OLR. This means that according to the regression equation, the grammaticality ratings for pronoun-OLR increase from 4.54 in an additional 0.35 point for each point reflexive-OLR receives. The results of this analysis are shown in figure 4. The Y axis in the figure is the grammaticality rating given to the pronoun case, while the X axis is the grammaticality rating given to the reflexive case. The blue dots represent pairs of scores, i.e. the scores a given participant gave a given sentence with a pronoun and with a reflexive. The black line

is the regression line, representing the prediction for what should be the score for the pronoun-case given the score for the reflexive-case. Most dots are not situated on or around the line, which shows that the correlation is very weak, i.e. that the score-given-to-reflexive is not a very good predictor of the score-given-to-pronoun.

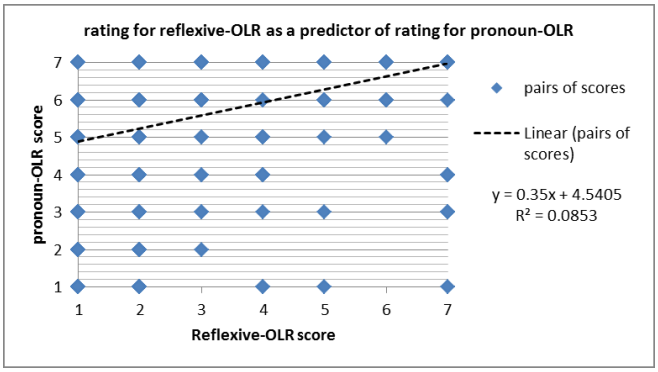


FIGURE 4: RATING FOR REFLEXIVE-OLR AS A PREDICTOR OF RATING FOR PRONOUN-OLR

Crucially, this weak 0.29 correlation is in the opposite direction than the one predicted by the competition theory. The correlation is positive, which means that the higher the grammaticality ratings are for reflexive-OLR, the higher they will be for pronoun-OLR in the same sentence. This result is incompatible with a competition theory. According to a competition theory, the grammaticality of pronouns depends on the ability to use a reflexive to express the same meaning, so that pronouns are grammatical when reflexives are not, and ungrammatical when reflexives are grammatical. The predictions of a competition theory are thus that there should be a negative correlation, so that the better the score-given-to-reflexive is, the worse the score-given-to-pronoun.

I went on to refine the analysis. According to Safir's theory, the competition between pronouns and reflexives is sometimes hindered by the existence of independent constraints that affect both forms, such as the Coargument Dependency Constraint. Its revised version ((80)) predicts that both forms should not be available for OLR with a distributive interpretation. Furthermore, we have seen that there is a non-binding-related dispreference for plural antecedents which affects pronouns. Therefore, the conditions in which a competition between pronouns and reflexives should be visible are essentially reduced to OLR in ECM sentences with a singular

antecedent, and to local OLR with a collective interpretation and a singular antecedent. I therefore ran the same linear regression analysis, only this time I excluded from the data sentences with a plural antecedent and sentences with local OLR with a distributive interpretation. I was left with pairs of score-given-to-reflexive and score-given-to-pronoun for two types of sentences: OLR sentences with ECM and a singular antecedent, and local OLR sentences with a collective interpretation and a singular antecedent. The pairs of scores were still pairs of scores given by the same participant to the same sentence, once with a reflexive and once with a pronoun.

I calculated a simple linear regression to predict the grammaticality ratings a participant gives to pronoun-OLR, based on the grammaticality ratings given by the same participant to the same sentence with reflexive-OLR. A significant regression equation was found ($F(1,128)= 7.04$, $p<0.01$), with an R^2 of 0.052, Pearson correlation of 0.23. Pronoun-OLR predicted grammaticality ratings are equal to 6.49 + 0.08 grammaticality ratings for reflexive-OLR. This means that according to the regression equation, the grammaticality ratings for pronoun-OLR increase from 6.49 in an additional 0.08 point for each point reflexive-OLR receives.

So we can see that even in the refined analysis, which excludes sentences with a plural antecedent and local-OLR sentences with a distributive interpretation, the results indicate a weak positive correlation between the score-given-to-reflexive and the score-given-to-pronoun.

Since the results show a positive correlation, rather than a negative correlation, I conclude that a competition theory is not a good characterization of the binding system that operates in Hebrew. Instead, it seems that the restrictions on pronouns are independent from the restrictions on reflexives, so that the grammaticality of pronouns in a given sentence is not calculated with relation to the grammaticality of reflexives in that same sentence.

The weak positive correlation found can be the result of two factors. First, it could be that participants vary in their use of the grammaticality scale so that some

participants are more "generous" than others. A "generous" participant will rate all of the sentences slightly higher than "ungenerous" participants. So for example, it could be that "ungenerous" participants give 6 out of 7 to perfectly grammatical sentences, while "generous" participants give 7 out of 7. If both deduct 5 points for reflexive-OLR and 1 point for pronoun-OLR, the "ungenerous" participants will end up rating reflexive-OLR 1 and pronoun-OLR 5, while the "generous" participants will rate reflexive-OLR 2 and pronoun-OLR 6. If so, the score a participant gives to a sentence with a reflexive can slightly help predict the score she will give the sentence with a pronoun, simply because it will indicate her level of "generosity".

A second possibility is that sentences vary in the level to which they sound good, so that there are mild differences even between two sentences with the same parameters. This could happen, for example, if one sentence makes use of a word not frequently in use, or perhaps even if a given participant "dislikes" a certain word in the sentence. Since the reflexive cases differ from the pronoun cases only in the choice of reflexive/pronoun, keeping every other word in the sentence constant, the score a participant gives to a sentence with a reflexive can help predict the score that participant will give to that same sentence with a pronoun.

3.2.5. OLR WITH REFLEXIVES

Despite the fact that Hebrew is not among the languages in which it is grammatical to express OLR with reflexives, the results in Hebrew can still tell us something important.

In section 2.1.4 we saw that there is a general ban on reflexive-OLR when the antecedent is plural, even in those languages that do allow reflexive-OLR with a singular antecedent. In section 2.2.4 I raised the possibility that this ban might simply be the reflection of a general non-syntactic factor which makes plural antecedents worse for OLR. The results do indicate that there is such a factor, and also that it is not syntactically motivated, as we have seen that it also operates in pronoun-OLR across embedding.

If the results had indicated that when the antecedent is plural there is no difference between ratings for reflexive-OLR and ratings for pronoun-OLR, this would have meant that the thing dragging down judgments for reflexive-OLR with a plural antecedent is the same non-syntactic factor that operates for pronoun-OLR with a plural antecedent. This would have meant that syntactically there is nothing wrong with reflexive-OLR with a plural antecedent, i.e. that Principle A must be changed so as to allow reflexive-OLR with plural antecedents.

However, the results show that in OLR with a plural antecedent, reflexives are rated significantly lower than pronouns. I take this to mean that in addition to the non-syntactic principle which lowers judgments for OLR with plural antecedents, there is also a syntactic principle at play disallowing reflexive-OLR with plural antecedents. This means that when we try to account for the fact that some languages allow for reflexive-OLR with a singular antecedent, the account should be one that enables these cases of OLR while ruling out reflexive-OLR with a plural antecedent.

In section 2.1.4 we have seen that Madigan and Yamada (2007) propose such an account. Their theory derives the grammaticality of reflexive-OLR with a singular antecedent for the languages that allow it, while ruling out reflexive-OLR with a plural antecedent. They suggest that in languages that allow reflexive-OLR, the plural reflexive forms are syntactically complex, constructed from an atomic reflexive along with a plural element able to pick out contextually available referents. In reflexive-OLR with a singular antecedent ((82)), the singular subject is coindexed with the atomic reflexive embedded in the plural reflexive form, and hence Principle A is satisfied. However, in reflexive-OLR with a plural antecedent ((83)), the singular object reflexive does not have a coindexed antecedent, and so Principle A is violated.

(82) én_1 $\text{magunkat}_{(1,2)}$ látom = én_1 $[\text{self}_1+\text{PL}_2]$ látom
'I see ourselves'
(83) *$\text{mi}_{(1,2)}$ magamat_1 látjuk
'We see myself'

Madigan and Yamada's theory is very appealing as it derives the asymmetry between singular and plural antecedents. It also has the welcomed result of maintaining

Principle A despite the availability of reflexive-OLR with a singular antecedent in some languages. The theory brings us very close to being able to account for all the data regarding reflexives, but as we have seen in section 2.1.4, Madigan and Yamada's system runs into trouble. The problem arises when dealing with plural reflexives with fully coreferential plural antecedents ((84)). If in these cases, too, the plural reflexive form is constructed from an atomic reflexive alongside a plural component able to pick out contextually available referents, then here, too, the atomic reflexive will require a coreferential and hence atomic antecedent. Since the subject is plural, it designates a set rather than an atomic entity, and hence it is not coreferential with the atomic reflexive.

(84) $mi_{(1,2)}$ $magunkat_{(1,2)}$ látjuk = $mi_{(1,2)}$ [self+PL] látjuk
'we see ourselves'

I suggest a revised version of their theory that will avoid this problem. Madigan and Yamada are right that reflexive-OLR is available in some languages because of a complex structure of their plural reflexive forms, such that the plural reflexive forms are constructed from an atomic reflexive and a plural element which refers to contextually available referents. But I suggest that the atomic reflexive embedded in the plural reflexive form does not require an antecedent at all. I adopt R&R's Condition A, repeated below as (85). According to this condition, the interpretation of reflexives is only regulated by the binding system if they are in an argument position. Since the atomic reflexive is embedded within the plural reflexive form, it is not in argument position and hence it trivially satisfies Condition A.

(85) R&R's Condition A: a reflexive-marked syntactic predicate is reflexive.

This version of Madigan and Yamada's theory avoids the abovementioned problem regarding fully coreferential plural antecedents to the plural reflexive, as the embedded atomic reflexive in (84) trivially satisfies Condition A. The same is true for the embedded atomic reflexive in (82), i.e. it is not in argument position and hence trivially satisfies Condition A. These non-argument reflexives are what R&R term logophoric anaphors. They are not regulated by the binding system, but rather by

other principles governing the use of logophors (which for the time being I will remain agnostic about).

This revised theory also captures the ungrammaticality of reflexive-OLR with a plural antecedent ((83)). The reflexive in such cases is in argument position, and thus Condition A requires that the predicate be reflexive, i.e. that the reflexive's coargument be coindexed with the reflexive. Since the subject is not coindexed with the reflexive, Condition A is violated and the sentence is deemed ungrammatical.

The proposed revision to Madigan and Yamada's theory hence enables us to account for all the data regarding reflexives. We can further note that this revised theory makes use of R&R's Condition A, while the results of analysis 3 also pointed to the correctness of R&R's theory by indicating that the data regarding pronouns is compatible with their Condition B. It seems, then, that when we focus on the phenomenon of OLR, R&R's predicate based binding theory is highly valuable.

CONCLUSIONS

In this paper I used the phenomenon of OLR to choose between theories regarding the binding system. One question regarding the binding system was whether the binding conditions enforce disjoint reference, or whether they only require non-coreference. Another question was whether there is an independent binding constraint for pronouns, i.e. Principle B, or whether the distribution of pronouns is derived from a competition with reflexives. Furthermore, I wanted to understand which factors affect the grammaticality of sentences with OLR, since it has been suggested in the literature that there is an asymmetry between collective and distributive interpretations, and that there is an asymmetry between singular and plural antecedents.

I conducted a grammaticality judgments study in Hebrew, where I checked sentences in three versions: with a first person object pronoun that overlaps in reference with a first person antecedent, with a first person object reflexive that overlaps in reference with a first person antecedent, or with a third person object pronoun that is interpreted as being disjoint in reference from a first person antecedent. These sentences varied in the number of the antecedent (singular, plural), in the distance from the antecedent (local, ECM, embedding) and the local sentences varied in the interpretation of the plural (collective, distributive).

The results of ANOVA analyses showed that there is a dispreference for plural antecedents, which is not related to binding violations as it is also present in pronoun-OLR across embedding. Furthermore, a binding violation seemed to occur for pronoun-OLR only in local distance with a distributive interpretation. This means that there is no syntactic requirement that a pronoun be disjoint in reference from a local antecedent.

A linear regression analysis was performed to choose between Reinhart and Reuland's (1993) independent semantic Condition B and Safir's (2004) competition theory. This analysis showed a weak positive correlation between the scores a

participant gave to a sentence with reflexive-OLR and the score the same participant gave to the same sentence with pronoun-OLR. I concluded from this that Safir's competition theory is not compatible with the state of affairs in Hebrew.

It has been claimed that pronouns and reflexives are in complementary distribution in the expression of OLR in Hungarian, which Safir has taken to be an indication that the forms are in competition. This leaves two logical options. It could be that different languages have different binding systems, so that while in Hebrew the grammaticality of pronouns in a given sentence is not dependent on the grammaticality of reflexives, in Hungarian it is. If this is true, then some characteristic of Hungarian makes its speakers converge on a binding system in which the forms are in competition, while some characteristic of Hebrew makes its speakers conceptualize the binding system as containing an independent constraint on the distribution of pronouns. The second option is that in Hungarian, too, the distribution of pronouns is determined by a pronoun-specific rule. In this case, the question is what makes pronoun-OLR with a singular antecedent ungrammatical. It is now time to remind ourselves that such sentences were actually completely ungrammatical with indefinite agreement on the verb, while some speakers found them grammatical with definite agreement on the verb. It could be, then, that the competition at work here is not between the pronoun and a reflexive, but rather between definite and indefinite agreement. That is, it could be that the availability of such examples with definite agreement drives down judgments for these examples with indefinite agreement.

Either way, the results from Hebrew clearly indicate that at least in some languages, there seems to be an independent semantic Condition B at play.

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APPENDIX 1: THE QUESTIONNAIRES

TABLE 3: LIST OF ALL THE SENTENCES FROM QUESTIONNAIRES 1 AND 2

	Singular antecedent	Plural antecedent
Local distributive with pronoun-OLR (questionnaire 1)	1. helbaŝti otanu exad axrey ha-ŝeni dressed.1SG us one after the-other 'I dressed us one after the other' 2. cavateti otanu pinched.1SG us 'I pinched us' 3. sirakti otanu combed.1SG us.ACC 'I combed our hair' 4. he'eracti otano axat axat admired.1SG us one one 'I admired each of us' 5. iparti otano axat axrey ha-ŝniya applied-makeup.1SG us.ACC one after the-other 'I did our makeup one after the other'	1. anaxnu boxnim oti be-torot we examining.1PL me in-turns 'we are taking turns examining me' 2. iparnu oti axat axrey ha-ŝniya applied-makeup.1PL me.ACC one after the-other 'we did my makeup one after the other' 3. hecbanu li exad exad voted.1PL for-me one one 'we each voted for me' 4. cilamnu oti be-torot photographed.1PL me in-turns 'we took turns photographing me' 5. he'eracno oti exad exad admired.1PL me one one 'Each of us admired me'
Local distributive with reflexive-OLR (questionnaire 1)	1. helbaŝti et acmenu exad axrey ha-ŝeni dressed.1SG ourselves one after the-other 'I dressed ourselves one after the other' 2. cavateti et acmenu pinched.1SG ourselves 'I pinched ourselves' 3. sirakti et acmenu combed.1SG ourselves.ACC 'I combed our hair' 4. he'eracti et acmenu axat axat admired.1SG ourselves one one 'I admired each of ourselves' 5. iparti et acmenu axat axrey ha-ŝniya applied-makeup.1SG ourselves.ACC one after the-other 'I did our makeup one after the other'	1. anaxnu boxnim et acmi be-torot we examining.1PL myself in-turns 'we are taking turns examining myself' 2. iparnu et acmi axat axrey ha-ŝniya applied-makeup.1PL myself one after the-other 'we did my makeup one after the other' 3. hecbanu le-acmi exad exad voted.1PL for-myself one one 'we each voted for myself' 4. cilamnu et acmi be-torot photographed.1PL myself in-turns 'we took turns photographing myself' 5. he'eracno et acmi exad exad admired.1PL myself one one 'Each of us admired myself'
Local distributive	1. helbaŝti otam exad axrey ha-ŝeni dressed.1SG them one after the-other	1. anaxnu boxnim ota be-torot we examining.1PL her in-turns

with disjoint reference (questionnaire 2)	'I dressed them one after the other' 2. cavateti otam pinched.1SG them 'I pinched them' 3. sirakti otam combed.1SG them.ACC 'I combed their hair' 4. he'eracti otan axat axat admired.1SG them one one 'I admired each of them' 5. iparti otan axat axrey ha-ŝniya applied-makeup.1SG them.ACC one after the-other 'I did their makeup one after the other'	'we are taking turns examining her' 2. iparnu ota axat axrey ha-ŝniya applied-makeup.1PL her.ACC one after the-other 'we did her makeup one after the other' 3. hecbanu lo exad exad voted.1PL for-him one one 'we each voted for him' 4. cilamnu oto be-torot photographed.1PL him in-turns 'we took turns photographing him' 5. he'eracno ota exad exad admired.1PL her one one 'Each of us admired her'
Local collective with pronoun-OLR (questionnaire 1)	1. xilakti otanu le-kvocot divided.1SG us to-groups 'I divided us to groups' 2. kibacti otanu beyaxad grouped.1SG us together 'I grouped us together' 3. yicagti otanu ba-erovizyon represented.1SG us in-Eurovision 'I represented us in the Eurovision Song Contest' 4. hayinu zug madhim, he'emanti banu were couple amazing, believed.1SG in_us 'we were an amazing couple, I believed in us' 5. raŝamti otanu la-taxarut ke-kvoca enrolled.1SG us to-the-competition as-group 'I enrolled us to the competition as a group'	1. hexanu oti la-olimpiada beyaxad prepared.1PL me to-the-Olympics together 'we prepared me for the Olympics together' 2. baxarnu oti be-rov ŝel asara kolot elected.1PL me in-majority of ten votes 'we elected me by a majority of ten votes' 3. beyaxad he'evarnu oti le-misrad axer together moved.1PL me to-office other 'together we moved me to another office' 4. he'enaknu li et ha-matana gave.1PL to-me the-gift 'we gave me the gift' 5. helbaŝnu oti be-taxposet leycan dressed.1PL me in-costume clown 'we dressed me in a clown costume'
Local collective with reflexive-OLR (questionnaire 1)	1. xilakti acmenu le-kvocot divided.1SG ourselves to-groups 'I divided ourselves to groups' 2. kibacti et acmenu beyaxad grouped.1SG ourselves together 'I grouped ourselves together' 3. yicagti et acmenu ba-erovizyon represented.1SG ourselves in-Eurovision	1. hexanu et acmi la-olimpiada beyaxad prepared.1PL myself to-the-Olympics together 'we prepared myself for the Olympics together' 2. baxarnu et acmi be-rov ŝel asara kolot elected.1PL myself in-majority of ten votes 'we elected myself by a majority of ten votes' 3. beyaxad he'evarnu et acmi le-misrad axer together moved.1PL myself to-office other

	'I represented ourselves in the Eurovision Song Contest' 4. hayinu zug madhim, he'emanti be-acmenu were couple amazing, believed.1SG in_ourselves 'we were an amazing couple, I believed in ourselves' 5. raŝamti et acmenu la-taxarut ke-kvoca enrolled.1SG ourselves to-the-competition as-group 'I enrolled ourselves to the competition as a group'	'together we moved myself to another office' 4. he'enaknu le-acmi et ha-matana gave.1PL to-myself the-gift 'we gave myself the gift' 5. helbaŝnu et acmi be-taxposet leycan dressed.1PL myself in-costume clown 'we dressed myself in a clown costume'
Local collective with disjoint reference (questionnaire 2)	1. xilakti otam le-kvocot divided.1SG them to-groups 'I divided them to groups' 2. kibacti otam beyaxad grouped.1SG them together 'I grouped them together' 3. yicagti otam ba-erovizyon represented.1SG them in-Eurovision 'I represented them in the Eurovision Song Contest' 4. hem hayu zug madhim, he'emanti behem they were couple amazing, believed.1SG in_them 'they were an amazing couple, I believed in them' 5. raŝamti otam la-taxarut ke-kvoca enrolled.1SG them to-the-competition as-group 'I enrolled them to the competition as a group'	1. hexanu oto la-olimpiada beyaxad prepared.1PL him to-the-Olympics together 'we prepared him for the Olympics together' 2. baxarnu oto be-rov ŝel asara kolot elected.1PL him in-majority of ten votes 'we elected him by a majority of ten votes' 3. beyaxad he'evarnu oto le-misrad axer together moved.1PL him to-office other 'together we moved him to another office' 4. he'enaknu lo et ha-matana gave.1PL to-him the-gift 'we gave me the gift' 5. helbaŝnu oto be-taxposet leycan dressed.1PL him in-costume clown 'we dressed him in a clown costume'
ECM with pronoun-OLR (questionnaire 1)	1. ani ro'e otanu megi'im raxok I see.1SG us arriving far 'I see us getting far' 2. raciti otanu me'uxadim wanted.1sg us united 'I wanted us united' 3. ani zoxeret otanu mexayxim I remember.1SG us smiling 'I remember us smiling' 4. hexŝavti otanu le-bney adam tovim considered.1SG us to-human beings good 'I considered us to be good human beings' 5. ŝamati otanu ŝarim heard.1SG us singing	1. ra'inu oti me'abed ŝlita saw.1PL me lose control 'we saw me lose control' 2. racinu oti ba-xamiŝiya ha-sofit wanted.1PL me in-the-five the-final 'we wanted me in the final five' 3. zaxarnu oti me'uŝar remembered.1PL me happy 'we remembered me happy' 4. anaxnu maxŝivim oti le-mitmodedet re'uya we consider me to-candidate deserving 'we consider me to be a deserving candidate' 5. ŝamanu oti co'ek be-behala heard.1PL me shout in-fear

	'I heard us singing'	'we heard me shout in fear'
ECM with reflexive-OLR (questionnaire 1)	1. ani ro'e et acmenu megi'im raxok I see.1SG ourselves arriving far 'I see ourselves getting far' 2. raciti et acmenu me'uxadim wanted.1sg ourselves united 'I wanted ourselves united' 3. ani zoxeret et acmenu mexayxim I remember.1SG ourselves smiling 'I remember ourselves smiling' 4. hexŝavti et acmenu le-bney adam tovim considered.1SG ourselves to-human beings good 'I considered ourselves to be good human beings' 5. ŝamati et acmenu ŝarim heard.1SG ourselves singing 'I heard ourselves singing'	1. ra'inu et acmi me'abed ŝlita saw.1PL myself lose control 'we saw myself lose control' 2. racinu et acmi ba-xamiŝiya ha-sofit wanted.1PL myself in-the-five the-final 'we wanted myself in the final five' 3. zaxarnu et acmi me'uŝar remembered.1PL myself happy 'we remembered myself happy' 4. anaxnu maxŝivim et acmi le-mitmodedet re'uya we consider myself to-candidate deserving 'we consider myself to be a deserving candidate' 5. ŝamanu et acmi co'ek be-behala heard.1PL myself shout in-fear 'we heard myself shout in fear'
ECM with disjoint reference (questionnaire 2)	1. ani ro'e otam megi'im raxok I see.1SG them arriving far 'I see them getting far' 2. raciti otam me'uxadim wanted.1sg them united 'I wanted them united' 3. ani zoxeret otam mexayxim I remember.1SG them smiling 'I remember them smiling' 4. hexŝavti otam le-bney adam tovim considered.1SG them to-human beings good 'I considered them to be good human beings' 5. ŝamati otam ŝarim heard.1SG them singing 'I heard them singing'	1. ra'inu oto me'abed ŝlita saw.1PL him lose control 'we saw him lose control' 2. racinu oto ba-xamiŝiya ha-sofit wanted.1PL him in-the-five the-final 'we wanted him in the final five' 3. zaxarnu oto me'uŝar remembered.1PL him happy 'we remembered him happy' 4. anaxnu maxŝivim ota le-mitmodedet re'uya we consider her to-candidate deserving 'we consider her to be a deserving candidate' 5. ŝamanu oto co'ek be-behala heard.1PL him shout in-fear 'we heard him shout in fear'
Embedding with pronoun-OLR (questionnaire 1)	1. kiviti ŝe-anaxnu mo'amadim la-pras hope.1sg that-we nominees for the-prize 'I hoped that we are nominated for the prize' 2. ani ma'amina ŝe-hi mexabevet otanu I believe that-she likes.3SG us	1. xaŝavnu ŝe-ani anace'ax thought.1PL that-I will win 'we thought that I will win' 2. anaxnu mekavim ŝe-hi tizkor oti we hope.1PL that-she remember.3SG.FUT me

	'I believe she likes us' 3. bikaŝti mimena lecalem otanu asked.1SG from_her to_photograph us 'I asked her to photograph us' 4. yadati ŝe-anaxnu mofi'im ba-katava knew.1SG that-we appear in-the-article 'I knew that we are mentioned in the article' 5. ani xoŝev ŝe-hu ya'adif otanu I think that-he prefer.3SG.FUT us 'I think he will prefer us'	'we hope that she will remember me' 3. bikaŝnu mimena liŝkol oti la-tafkid asked.1PL her to_consider me for-the-job 'we asked her to consider me for the job' 4. anaxnu ma'aminim ŝe-ani acli'ax ba-mivxan we believe.1PL that-I succeed.1SG.FUT in_the-test 'we believe that I will do well on the test' 5. anaxnu yod'im ŝe-hi ra'ata oti ŝam we know.1PL that-she saw.3SG me there 'we know she saw me there'
Embedding with disjoint reference (questionnaire 2)	1. kiviti ŝe-hem mo'amadim la-pras hope.1sg that-they nominees for the-prize 'I hoped that they are nominated for the prize' 2. ani ma'amina ŝe-hi mexabevet otam I believe that-she likes.3SG them 'I believe she likes them' 3. bikaŝti mimena lecalem otam asked.1SG from_her to_photograph them 'I asked her to photograph them' 4. yadati ŝe-hem mofi'im ba-katava knew.1SG that-they appear in-the-article 'I knew that they are mentioned in the article' 5. ani xoŝev ŝe-hu ya'adif otam I think that-he prefer.3SG.FUT them 'I think he will prefer them'	1. xaŝavnu ŝe-hi tenace'ax thought.1PL that-she will win 'we thought that she will win' 2. anaxnu mekavut ŝe-hi tizkor oto we hope.1PL that-she remember.3SG.FUT him 'we hope that she will remember him' 3. bikaŝnu mimena liŝkol oto la-tafkid asked.1PL her to_consider him for-the-job 'we asked her to consider him for the job' 4. anaxnu ma'aminim ŝe-hi tacli'ax ba-mivxan we believe.1PL that-she succeed.1SG in_the-test 'we believe that she will do well on the test' 5. anaxnu yod'im ŝe-hi ra'ata oto ŝam we know.1PL that-she saw.3SG him there 'we know she saw him there'
Filler sentences		
<u>Filler sentences from questionnaire 1:</u> 1. hitxaŝmalti otxa was_electrocuted.1SG.HITPA'EL you.ACC 2.bikarnu oto be-torot visited.1PL him in-turns 'we took turns visiting him' 3. nifgaŝti itam exad axrey ha-ŝeni met.1SG with.3PL one after the-other 'I met with them one after the other' 4. kibalnu et ha-haxlata beyaxad	<u>Filler sentences from questionnaire 2:</u> 1. xeci me-ha-yeladim hegi'u lema'et dani half of-the-kids arrived except_for dani 'half of the kids arrived except for dani' 2. milvad xeci me-ha-ovdim kulam be'ad ha-toxnit except_for half of-the-workers everyone for the-plan 'except for half of the workers, everyone support the plan' 3. rov ha-ovdot xuc mimena ŝovtot most the-workers except for_her striking 'most of the workers except for her are one strike'	

received.1PL the-decision together 'we made the decision together' 5. ani sone otam exad exad I hate them one one 'I hate each of them' 6. beyaxad patartem et ha-be'aya ŝeli together solved.2PL the-problem mine 'you solved my problem together' 7. he'eracti oti adored.1SG me 'I adored me' 8. cavateti et acmi kedey lo leheradem pinched.1SG myself to not fall_asleep 'I pinched myself to stay awake' 9. hi ra'ata oto mitgaber al kol ha-kŝayim she saw.3SG him overcome on all the-difficulties 'she saw him overcome all obstacles' 10. hu raca ota lecido he wanted.3SG her by_his_side 'he wanted her by his side' 11. hem zoxrim ota coxeket they remember.1PL her laughing.3SG 'they remember her laughing' 12. hen ŝam'u oto loxeŝ they heard.3PL him whisper 'they heard him whisper' 13. hexŝavti oto le-adam yaŝar considered.1SG him to-person honest 'I considered him to be an honest person' 14. cavateti oti kedey lo leheradem pinched.1SG me to not fall_asleep 'I pinched me to stay awake' 15. nifgaŝnu ito exad axrey ha-ŝeni met.1PL with.3SG one after the-other 'we met with him one after the other'	4. me'atim xuc mimena nirŝemu few except for_her signed_up 'few except for her signed up' 5. xuc mimena rov ha-ŝotrot hegi'u la-tekes except for_her most the-policewomen arrived to-the-ceremony 'except for her, most policewomen came to the ceremony' 6. eyze baxur milvado iŝen some guy except_him smoked 'some guy apart from him smoked' 7. xuc mimeno af exad lo ixer except for_him any one not came_late 'except for him no one was late' 8. af exad lo sam lev xuc me-ha-me'avtaxat any one didn't pay attention except for-the-security_guard 'no one noticed except for the security guard' 9. milvada af exad lo hitkaŝer elay apart_her any one didn't call to_me 'apart from her no one called me' 10. milvad dani kol ha-kita her'iŝa except dani all the-class made_noise 'except for dani, everyone in the class made noise' 11. acmo ŝata et ha-kafe himself drank the-coffee 'himself drank the coffee' 12. ŝney xaŝudim lema'et dani hodu ba-aŝma two suspects except dani admitted in-the-blame 'two suspects except from dani confessed' 13. kulam hayu merucim xuc mimeno everyone were satisfied except for_him 'everyone were satisfied except for him' 14. hu histarek et acmo he combed.3SG.HITPA'EL himself 15. af exad xuc mimeni lo yode'a kama ani marvi'ax any one except for_me not know how_much I earn 'no one but me knows how much money I make' 16. zarakti et rov ha-xafacim ŝelo xuc me-ha-me'il

	threw.1SG most the-things his except for-the-coat 'I threw away most of his things except his coat' 17. hu yode'a ŝe-hi sonet et acmo he know.3SG that-she hate himself 'he knows that she hates himself' 18. hem axlu xeci me-ha-ugot lema'et ŝeli they ate half of-the-cakes except mine 'they ate half of the cakes except for mine' 19. zulat dina af exad lo diber except dina any one not talk 'no one talked except for dina' 20. xamiŝa xaverim ŝeli xuc me-ŝloŝa ŝe-ba-cava hegi'u five friends mine except for-three that-in_the-army came 'five friends of mine except for three that are in the army came'

TABLE 4: INSTRUCTIONS FOR QUESTIONNAIRES

Translation of instructions to English	Instructions as they appeared in Hebrew
In this questionnaire you will be presented with sentences in Hebrew. Under each sentence there will be a scale of numbers from 1 to 7. Your task is to rate how "good" the sentence sounds in Hebrew, by using the scale underneath it. The intention is not to rate the degree to which the sentence portrays a high register of Hebrew or "elegant language", but rather simply how natural the sentence sounds in Hebrew (if you heard it in a suitable context.(Rate the phrasing of each sentence by choosing a number between 1 and 7. Rate sentences that sound completely proper with 7, and rate sentences that sound very bad with 1. Some of the sentences you will see will be better than others. Use the range of the scale to express how good the sentences sound in Hebrew. Notice that the task is not to determine how likely it is that the sentence will be uttered, but rather to simply rate whether the phrasing sounds right. Use your judgment in rating the sentences. The goal is to get your intuitions as speakers, and so there is no need to consult with others or check grammar books.	*ההוראות כתובות בלשון זכר, אך מיועדות לכולן בשאלון זה יוצגו בפניכם משפטים בעברית. מתחת לכל משפט תופיע סקאלה של מספרים מ-1 עד 7. המטרה שלכם היא לדרג כמה "טוב" נשמע המשפט בעברית, ע"י שימוש בסקאלה שתופיע תחתיו. הכוונה היא לא לעד כמה המשפט מדגים "עברית יפה וגבוהה", אלא פשוט עד כמה טבעי הוא נשמע לכם בעברית (אם הייתם שומעים אותו בהקשר הנכון). דרגו את הניסוח של כל משפט באמצעות בחירה במספר בין 1 ל-7. דרגו ב-7 משפטים שנשמעים לכם תקינים לגמרי, ודרגו ב-1 משפטים שנשמעים לכם גרועים מאוד. חלק מהמשפטים שתראו יהיו טובים יותר וחלקם יהיו טובים פחות. השתמשו בטווח של הסקאלה כדי להביע עד כמה המשפטים נשמעים לכם טוב בעברית. שימו לב! המטלה איננה להכריע אם סביר או לא שהמשפט ייאמר, אלא פשוט האם הניסוח שלו נשמע לכם תקין. היסתמכו על שיקול דעתכם בדירוג המשפטים. המטרה היא לקבל את האינטואיציה שלכם כדוברים וכדוברות, ולכן אין צורך להתייעץ עם אחרים ואין צורך לבדוק בספרי דקדוק. תודה רבה על השתתפותכם!

APPENDIX 2: SPSS OUTPUTS FOR ANALYSIS 1

TABLE 5: DESCRIPTIVE STATISTICS FOR ITEMS FROM ANALYSIS 1

Descriptive Statistics					
Type of relation	**Distance**	**Antecedent number**	**Mean**	**Std. Deviation**	**N**
disjoint reference	local	singular antecedent	6.34	1.253	330
		plural antecedent	5.75	1.629	330
		Total	6.04	1.482	660
	ECM	singular antecedent	6.31	1.238	165
		plural antecedent	6.58	.856	165
		Total	6.45	1.071	330
	embedding	singular antecedent	6.54	.991	165
		plural antecedent	6.59	.911	165
		Total	6.56	.950	330
	Total	singular antecedent	6.38	1.191	660
		plural antecedent	6.17	1.374	660
		Total	6.27	1.290	1320
Pronoun-OLR	local	singular antecedent	5.68	1.917	386
		plural antecedent	3.98	2.267	400
		Total	4.81	2.267	786
	ECM	singular antecedent	6.31	1.281	200
		plural antecedent	4.68	2.169	200
		Total	5.49	1.958	400
	embedding	singular antecedent	6.86	.593	200
		plural antecedent	6.29	1.341	200
		Total	6.58	1.073	400
	Total	singular antecedent	6.14	1.597	786
		plural antecedent	4.73	2.255	800
		Total	5.43	2.079	1586
reflexive-OLR	local	singular antecedent	2.10	1.756	260
		plural antecedent	1.66	1.289	260
		Total	1.88	1.554	520
	ECM	singular antecedent	3.18	2.236	130
		plural antecedent	1.92	1.525	130
		Total	2.55	2.012	260
	Total	singular antecedent	2.46	1.992	390
		plural antecedent	1.75	1.375	390
		Total	2.10	1.747	780

TABLE 6: RESULTS OF FACTORIAL ANOVA FOR ANALYSIS 1.

Factorial ANOVA

Dependent Variable: Grammaticality ratings

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	11013.085[a]	15	734.206	287.081	.000
Intercept	71637.470	1	71637.470	28010.874	.000
Type of relation	6437.858	2	3218.929	1258.629	.000
Distance	697.417	2	348.708	136.348	.000
Antecedent number	362.120	1	362.120	141.592	.000
Type of relation * Distance	186.628	3	62.209	24.324	.000
Type of relation * Antecedent number	238.939	2	119.470	46.714	.000
Distance * Antecedent number	58.956	2	29.478	11.526	.000
Type of relation * Distance * Antecedent number	88.767	3	29.589	11.570	.000
Error	9385.981	3670	2.557		
Total	113592.000	3686			
Corrected Total	20399.066	3685			

a. R Squared = .540 (Adjusted R Squared = .538)

TABLE 7: RESULTS OF POST HOC TUKEY HSD FOR TYPE OF RELATION IN ANALYSIS 1

Multiple Comparisons

Grammaticality ratings
Tukey HSD

(I) Type of relation	(J) Type of relation	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
disjoint reference	pronoun-OLR	.84*	.060	.000	.71	.98
	reflexive-OLR	4.17*	.072	.000	4.00	4.34
pronoun-OLR	disjoint reference	-.84*	.060	.000	-.98	-.71
	reflexive-OLR	3.33*	.070	.000	3.16	3.49
reflexive-OLR	disjoint reference	-4.17*	.072	.000	-4.34	-4.00
	pronoun-OLR	-3.33*	.070	.000	-3.49	-3.16

Based on observed means.
The error term is Mean Square(Error) = 2.557.

*. The mean difference is significant at the .05 level.

TABLE 8: RESULTS OF POST HOC TUKEY HSD FOR DISTANCE IN ANALYSIS 1

Multiple Comparisons

Grammaticality ratings
Tukey HSD

(I) Distance	(J) Distance	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
local	ECM	-.59*	.062	.000	-.73	-.44
	embedding	-2.12*	.069	.000	-2.28	-1.96
ECM	embedding	-1.53*	.078	.000	-1.72	-1.35
	local	.59*	.062	.000	.44	.73
embedding	ECM	1.53*	.078	.000	1.35	1.72
	local	2.12*	.069	.000	1.96	2.28

Based on observed means.
The error term is Mean Square(Error) = 2.557.

*. The mean difference is significant at the .05 level.

TABLE 9: RESULTS OF PAIRWISE COMPARISONS FOR DISTANCE X TYPE OF RELATION IN ANALYSIS 1

Pairwise Comparisons

Dependent Variable: Grammaticality ratings

Distance	(I) Type of relation	(J) Type of relation	Mean Difference (I-J)	Std. Error	Sig.[a]	95% Confidence Interval for Difference[a]	
						Lower Bound	Upper Bound
local	disjoint reference	pronoun-OLR	1.216*	.084	.000	1.014	1.418
		reflexive-OLR	4.161*	.094	.000	3.937	4.386
	pronoun-OLR	disjoint reference	-1.216*	.084	.000	-1.418	-1.014
		reflexive-OLR	2.945*	.090	.000	2.729	3.162
	reflexive-OLR	disjoint reference	-4.161*	.094	.000	-4.386	-3.937
		pronoun-OLR	-2.945*	.090	.000	-3.162	-2.729
ECM	disjoint reference	pronoun-OLR	.953*	.119	.000	.668	1.238
		reflexive-OLR	3.899*	.133	.000	3.582	4.217
	pronoun-OLR	disjoint reference	-.953*	.119	.000	-1.238	-.668
		reflexive-OLR	2.946*	.127	.000	2.641	3.251
	reflexive-OLR	disjoint reference	-3.899*	.133	.000	-4.217	-3.582
		pronoun-OLR	-2.946*	.127	.000	-3.251	-2.641
embedding	disjoint reference	pronoun-OLR	-.014	.119	.907	-.247	.219
		reflexive-OLR	.[b]	.	.	.	.
	pronoun-OLR	disjoint reference	.014	.119	.907	-.219	.247
		reflexive-OLR	.[b]	.	.	.	.
	reflexive-OLR	disjoint reference	.[c]	.	.	.	.
		pronoun-OLR	.[c]	.	.	.	.

Based on estimated marginal means

*. The mean difference is significant at the .05 level.

a. Adjustment for multiple comparisons: Bonferroni.

b. The level combination of factors in (J) is not observed.

c. The level combination of factors in (I) is not observed.

TABLE 10: RESULTS OF PAIRWISE COMPARISONS FOR TYPE OF RELATION X ANTECEDENT NUMBER IN ANALYSIS 1

Pairwise Comparisons

Dependent Variable: Grammaticality ratings

Type of relation	(I) Antecedent number	(J) Antecedent number	Mean Difference (I-J)	Std. Error	Sig.[a]	95% Confidence Interval for Difference[a]	
						Lower Bound	Upper Bound
disjoint reference	singular antecedent	plural antecedent	.092	.093	.322	-.090	.274
	plural antecedent	singular antecedent	-.092	.093	.322	-.274	.090
pronoun-OLR	singular antecedent	plural antecedent	1.300*	.084	.000	1.135	1.466
	plural antecedent	singular antecedent	-1.300*	.084	.000	-1.466	-1.135
reflexive-OLR	singular antecedent	plural antecedent	.852*,b,c	.121	.000	.614	1.090
	plural antecedent	singular antecedent	-.852*,b,c	.121	.000	-1.090	-.614

Based on estimated marginal means

a. Adjustment for multiple comparisons: Bonferroni.

*. The mean difference is significant at the .05 level.

b. An estimate of the modified population marginal mean (I).

c. An estimate of the modified population marginal mean (J).

TABLE 11: RESULTS OF PAIRWISE COMPARISONS FOR DISTANCE X ANTECEDENT NUMBER IN ANALYSIS 1

Pairwise Comparisons

Dependent Variable: Grammaticality ratings

Distance	(I) Antecedent number	(J) Antecedent number	Mean Difference (I-J)	Std. Error	Sig.[a]	95% Confidence Interval for Difference[a]	
						Lower Bound	Upper Bound
local	plural antecedent	singular antecedent	-.914*	.073	.000	-1.057	-.770
	singular antecedent	plural antecedent	.914*	.073	.000	.770	1.057
ECM	plural antecedent	singular antecedent	-.875*	.103	.000	-1.077	-.672
	singular antecedent	plural antecedent	.875*	.103	.000	.672	1.077
embedding	plural antecedent	singular antecedent	-.258*,b,c	.119	.030	-.491	-.025
	singular antecedent	plural antecedent	.258*,b,c	.119	.030	.025	.491

Based on estimated marginal means

*. The mean difference is significant at the .05 level.

a. Adjustment for multiple comparisons: Bonferroni.

b. An estimate of the modified population marginal mean (I).

c. An estimate of the modified population marginal mean (J).

TABLE 12: RESULTS OF PAIRWISE COMPARISONS FOR DISTANCE X ANTECEDENT NUMBER X TYPE OF RELATION IN ANALYSIS 1

Distance	Antecedent number	(I) Type of relation	(J) Type of relation	Mean Difference (I-J)	Std. Error	Sig.[a]	95% Confidence Interval for Difference[a]	
							Lower Bound	Upper Bound
local	singular antecedent	disjoint reference	pronoun-OLR	**.664***	**.120**	**.000**	**.377**	**.951**
			reflexive-OLR	**4.239***	**.133**	**.000**	**3.921**	**4.556**
		pronoun-OLR	disjoint reference	**-.664***	**.120**	**.000**	**-.951**	**-.377**
			reflexive-OLR	**3.575***	**.128**	**.000**	**3.268**	**3.882**
		reflexive-OLR	disjoint reference	**-4.239***	**.133**	**.000**	**-4.556**	**-3.921**
			pronoun-OLR	**-3.575***	**.128**	**.000**	**-3.882**	**-3.268**
	plural antecedent	disjoint reference	pronoun-OLR	**1.768***	**.119**	**.000**	**1.483**	**2.053**
			reflexive-OLR	**4.084***	**.133**	**.000**	**3.766**	**4.402**
		pronoun-OLR	disjoint reference	**-1.768***	**.119**	**.000**	**-2.053**	**-1.483**
			reflexive-OLR	**2.316***	**.127**	**.000**	**2.011**	**2.621**
		reflexive-OLR	disjoint reference	**-4.084***	**.133**	**.000**	**-4.402**	**-3.766**
			pronoun-OLR	**-2.316***	**.127**	**.000**	**-2.621**	**-2.011**
ECM	singular antecedent	disjoint reference	pronoun-OLR	**.000**	**.168**	**1.000**	**-.404**	**.402**
			reflexive-OLR	**3.132***	**.188**	**.000**	**2.683**	**3.581**
		pronoun-OLR	disjoint reference	**.001**	**.168**	**1.000**	**-.402**	**.404**
			reflexive-OLR	**3.133***	**.180**	**.000**	**2.702**	**3.565**
		reflexive-OLR	disjoint reference	**-3.132***	**.188**	**.000**	**-3.581**	**-2.683**
			pronoun-OLR	**-3.133***	**.180**	**.000**	**-3.565**	**-2.702**
	plural antecedent	disjoint reference	pronoun-OLR	**1.907***	**.168**	**.000**	**1.504**	**2.310**
			reflexive-OLR	**4.666***	**.188**	**.000**	**4.217**	**5.116**
		pronoun-OLR	disjoint reference	**-1.907***	**.168**	**.000**	**-2.310**	**-1.504**
			reflexive-OLR	**2.760***	**.180**	**.000**	**2.328**	**3.191**
		reflexive-OLR	disjoint reference	**-4.666***	**.188**	**.000**	**-5.116**	**-4.217**
			pronoun-OLR	**-2.760***	**.180**	**.000**	**-3.191**	**-2.328**
embedding	singular antecedent	disjoint reference	pronoun-OLR	**-.321**	**.168**	**.057**	**-.650**	**.009**
			reflexive-OLR	**.b**	**.**	**.**	**.**	**.**
		pronoun-OLR	disjoint reference	**.321**	**.168**	**.057**	**-.009**	**.650**
			reflexive-OLR	**.b**	**.**	**.**	**.**	**.**
		reflexive-OLR	disjoint reference	**.c**	**.**	**.**	**.**	**.**
			pronoun-OLR	**.c**	**.**	**.**	**.**	**.**
	plural antecedent	disjoint reference	pronoun-OLR	**.293**	**.168**	**.082**	**-.037**	**.623**
			reflexive-OLR	**.b**	**.**	**.**	**.**	**.**
		pronoun-OLR	disjoint reference	**-.293**	**.168**	**.082**	**-.623**	**.037**
			reflexive-OLR	**.b**	**.**	**.**	**.**	**.**
		reflexive-OLR	disjoint reference	**.c**	**.**	**.**	**.**	**.**
			pronoun-OLR	**.c**	**.**	**.**	**.**	**.**

Based on estimated marginal means.

*. The mean difference is significant at the .05 level.

a. Adjustment for multiple comparisons: Bonferroni.

b. The level combination of factors in (I) is not observed.

c. The level combination of factors in (J) is not observed.

TABLE 13: RESULTS OF PAIRWISE COMPARISONS FOR TYPE OF RELATION X DISTANCE X ANTECEDENT NUMBER IN ANALYSIS 1

Type of relation	Distance	(I) Antecedent number	(J) Antecedent number	Mean Difference (I-J)	Std. Error	Sig.[a]	95% Confidence Interval for Difference[a]	
							Lower Bound	Upper Bound
disjoint reference	local	singular antecedent	plural antecedent	.597*	.124	.000	.353	.841
		plural antecedent	singular antecedent	-.597*	.124	.000	-.841	-.353
	ECM	singular antecedent	plural antecedent	-.273	.176	.121	-.618	.072
		plural antecedent	singular antecedent	.273	.176	.121	-.072	.618
	embedding	singular antecedent	plural antecedent	-.048	.176	.783	-.394	.297
		plural antecedent	singular antecedent	.048	.176	.783	-.297	.394
pronoun-OLR	local	singular antecedent	plural antecedent	1.701*	.114	.000	1.478	1.925
		plural antecedent	singular antecedent	-1.701*	.114	.000	-1.925	-1.478
	ECM	singular antecedent	plural antecedent	1.635*	.160	.000	1.321	1.949
		plural antecedent	singular antecedent	-1.635*	.160	.000	-1.949	-1.321
	embedding	singular antecedent	plural antecedent	.565*	.160	.000	.251	.879
		plural antecedent	singular antecedent	-.565*	.160	.000	-.879	-.251
reflexive-OLR	local	singular antecedent	plural antecedent	.442*	.140	.002	.167	.717
		plural antecedent	singular antecedent	-.442*	.140	.002	-.717	-.167
	ECM	singular antecedent	plural antecedent	1.262*	.198	.000	.873	1.650
		plural antecedent	singular antecedent	-1.262*	.198	.000	-1.650	-.873
	embedding	singular antecedent	plural antecedent	.[b,c]	.	.	.	.
		plural antecedent	singular antecedent	.[b,c]	.	.	.	.

Based on estimated marginal means.

*. The mean difference is significant at the .05 level.

a. Adjustment for multiple comparisons: Bonferroni.

b. The level combination of factors in (I) is not observed.

c. The level combination of factors in (J) is not observed.

APPENDIX 3: SPSS OUTPUTS FOR ANALYSIS 2

TABLE 14: DESCRIPTIVE STATISTICS FOR ITEMS FROM ANALYSIS 2

Descriptive Statistics					
Type of relation	**Interpretation**	**Antecedent number**	**Mean**	**Std. Deviation**	**N**
disjoint reference	collective	plural antecedent	6.21	1.207	165
		singular antecedent	6.40	1.141	165
		Total	6.30	1.177	330
	distributive	plural antecedent	5.28	1.854	165
		singular antecedent	6.28	1.356	165
		Total	5.78	1.697	330
	Total	plural antecedent	5.75	1.629	330
		singular antecedent	6.34	1.253	330
		Total	6.04	1.482	660
pronoun-OLR	collective	plural antecedent	4.47	2.143	200
		singular antecedent	6.63	.841	200
		Total	5.55	1.952	400
	distributive	plural antecedent	3.48	2.286	200
		singular antecedent	4.66	2.203	186
		Total	4.05	2.319	386
	Total	plural antecedent	3.98	2.267	400
		singular antecedent	5.68	1.917	386
		Total	4.81	2.267	786
reflexive-OLR	collective	plural antecedent	1.90	1.478	130
		singular antecedent	2.42	1.936	130
		Total	2.16	1.738	260
	distributive	plural antecedent	1.42	1.018	130
		singular antecedent	1.79	1.498	130
		Total	1.61	1.291	260
	Total	plural antecedent	1.66	1.289	260
		singular antecedent	2.10	1.756	260
		Total	1.88	1.554	520

TABLE 15: RESULTS OF FACTORIAL ANOVA FOR ANALYSIS 2

Factorial ANOVA

Dependent Variable: Grammaticality ratings

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	6444.228[a]	11	585.839	208.186	.000
Intercept	34430.437	1	34430.437	12235.345	.000
Interpretation	344.400	1	344.400	122.387	.000
Antecedent number	388.157	1	388.157	137.937	.000
Type of relation	5206.074	2	2603.037	925.026	.000
Interpretation * Antecedent number	1.437	1	1.437	.511	.475
Inetpretation * Type of relation	105.856	2	52.928	18.809	.000
Antecedent number * Type of relation	154.023	2	77.011	27.367	.000
Interpretation * Antecedent number * Type of relation	72.237	2	36.118	12.835	.000
Error	5498.584	1954	2.814		
Total	50895.000	1966			
Corrected Total	11942.812	1965			

a. R Squared = .540 (Adjusted R Squared = .537)

TABLE 16: RESULTS OF PAIRWISE COMPARISONS FOR TYPE OF RELATION X INTERPRETATION IN ANALYSIS 2

Pairwise Comparisons

Dependent Variable: Grammaticality ratings

Type of relation	(I) Interpretation	(J) Interpretation	Mean Difference (I-J)	Std. Error	Sig.[a]	95% Confidence Interval for Difference[a]	
						Lower Bound	Upper Bound
disjoint reference	collective	distributive	.518*	.131	.000	.262	.774
	distributive	collective	-.518*	.131	.000	-.774	-.262
pronoun-OLR	collective	distributive	1.480*	.120	.000	1.245	1.714
	distributive	collective	-1.480*	.120	.000	-1.714	-1.245
reflexive-OLR	collective	distributive	.550*	.147	.000	.261	.839
	distributive	collective	-.550*	.147	.000	-.839	-.261

Based on estimated marginal means

*. The mean difference is significant at the .05 level.

a. Adjustment for multiple comparisons: Bonferroni.

TABLE 17: RESULTS OF PAIRWISE COMPARISONS FOR TYPE OF RELATION X INTERPRETATION X ANTECEDENT NUMBER IN ANALYSIS 2

Pairwise Comparisons

Dependent Variable: Grammaticality ratings

Interpretation	Antecedent number	(I) Type of relation	(J) Type of relation	Mean Difference (I-J)	Std. Error	Sig.[a]	95% Confidence Interval for Difference[a]	
							Lower Bound	Upper Bound
collective	plural antecedent	disjoint reference	pronoun-OLR	1.736*	.176	.000	1.313	2.159
			reflexive-OLR	4.306*	.197	.000	3.835	4.777
		pronoun-OLR	disjoint reference	-1.736*	.176	.000	-2.159	-1.313
			reflexive-OLR	2.570*	.189	.000	2.117	3.023
		reflexive-OLR	disjoint reference	-4.306*	.197	.000	-4.777	-3.835
			pronoun-OLR	-2.570*	.189	.000	-3.023	-2.117
	singular antecedent	disjoint reference	pronoun-OLR	-.230	.176	.577	-.653	.193
			reflexive-OLR	3.985*	.197	.000	3.513	4.456
		pronoun-OLR	disjoint reference	.230	.176	.577	-.193	.653
			reflexive-OLR	4.215*	.189	.000	3.762	4.667
		reflexive-OLR	disjoint reference	-3.985*	.197	.000	-4.456	-3.513
			pronoun-OLR	-4.215*	.189	.000	-4.667	-3.762
distributive	plural antecedent	disjoint reference	pronoun-OLR	1.800*	.176	.000	1.377	2.223
			reflexive-OLR	3.862*	.197	.000	3.390	4.333
		pronoun-OLR	disjoint reference	-1.800*	.176	.000	-2.223	-1.377
			reflexive-OLR	2.062*	.189	.000	1.609	2.515
		reflexive-OLR	disjoint reference	-3.862*	.197	.000	-4.333	-3.390
			pronoun-OLR	-2.062*	.189	.000	-2.515	-1.609
	singular antecedent	disjoint reference	pronoun-OLR	1.629*	.179	.000	1.199	2.059
			reflexive-OLR	4.493*	.197	.000	4.021	4.964
		pronoun-OLR	disjoint reference	-1.629*	.179	.000	-2.059	-1.199
			reflexive-OLR	2.864*	.192	.000	2.404	3.323
		reflexive-OLR	disjoint reference	-4.493*	.197	.000	-4.964	-4.021
			pronoun-OLR	-2.864*	.192	.000	-3.323	-2.404

Based on estimated marginal means

*. The mean difference is significant at the .05 level.

a. Adjustment for multiple comparisons: Bonferroni.