Tel-Aviv University
The Lester and Sally Entin Faculty of Humanities
Department of Linguistics

The Pragmatics-Phonology Interface:

Accessibility and Reduction – Hebrew Possessives

Thesis submitted for M.A. Degree at Tel-Aviv University

by:

Evan Gary Cohen

Thesis Advisor:

Prof. Mira Ariel

July, 2003

Table of Contents

<u>0. Introduction</u>

Hebrew possessives, as in many languages, are of two major forms:[1]

    a.   Analytic nominal NPs such as [ha-sefer ʃel ha-jeled] (the-book of the-boy)

        'the boy's book'

    b.   Analytic pronominal possessives such as [ha-sefer ʃelo] (the-book his) 'his

        book'.

There are, however, two additional forms of Hebrew possessives. The first, a possessive suffix attached to a nominal (e.g.[axot] 'sister' ; [axot-i] 'my sister'] ; [axot-xa] 'your-masc. sister' ; [axot-a] 'her sister'), is used primarily in formal written Hebrew. Its distribution in spoken Hebrew is limited to certain fixed lexical items, such as family members and body parts, although, in theory, it could be used with any NP. This paper, dealing with spoken Hebrew, will not discuss such forms.

Most Hebrew speakers are aware of the fact that pronominal possessives may have two <u>spoken</u> forms, a full and a contracted form. It is the second form, a reduced version of the pronominal form, which is of interest.[2]

Table 1: Full v. Reduced pronominal possessives

Full Form[3]	Contracted Form	Translation
ʃel<u>i</u>	ʃli	1P-sing.
ʃelx<u>a</u>	ʃxa	2P-sg-masc
ʃel<u>a</u>x	ʃlax	2P-sg-fem
ʃel<u>o</u>	ʃlo	3P-sg-masc
ʃel<u>a</u>	ʃla	3p-sg-fem
ʃel<u>a</u>nu	ʃlanu	1P-pl
ʃelax<u>e</u>m	ʃlaxem	2P-pl-masc
ʃelax<u>e</u>n	ʃlaxen	2P-pl-fem
ʃelah<u>e</u>m	ʃlahem	3P-pl-masc
ʃelah<u>e</u>n	ʃlahen	3P-pl-fem

---

[1] Hebrew = Modern Hebrew, as spoken by native speakers in present-day Israel, rather than Biblical/Tiberian Hebrew.

[2] The second person singular masculine form [ʃelxa] is the only form which can be <u>written</u> as a reduced form [ʃxa], with an apostrophe replacing the deleted /l/. It is considered extremely informal, and used primarily in texts written by or targeting a young audience. Most uses are with family members – such as [ima ʃxa] (mother your-singular-masc.) 'your mother' – and are often derogatory.

[3] The underlined vowel is the location of the stress in isolation.

The data collected, presented and analysed in this study show that the pronunciation of the reduced pronominal possessive is, in many cases, different from the above forms. In most cases, the contracted forms appear to be reduced forms of the possessive pronouns, in which the initial unstressed /e/ is deleted (for details, see §2). However, in some cases, the reduced [ʃli], for example, surfaces simply as [ʃl]. In other instances, [ʃlax] is pronounced [ʃx]. The third person plural forms appeared as [ʃela(h)em], as [ʃlaem] or as [ʃleem]. The reduction is not uniform, and the exact definition of what constitutes a reduced form is no mean feat.[4] I will treat all reduced forms similarly and refer to them all as clitics (see below).

Comrie (1989) defines a clitic as a constituent without independent stress, pronounced as part of an adjacent word, its host. This constituent is obligatorily positioned in relation to its host (either before or after, depending on the type of clitic and the language). Haiman (1991) suggests that clitics exhibit properties of both bound affixes and independent words. Langacker (1991) defines the English articles 'a' and 'the' as having a semi-clitic status, since they alternately appear either as clitics or, in the marked cases, as independent words. For simplicity's sake, I will slightly modify these definitions, and define a clitic as a reduced alternate form of a full grammatical item (i.e. an independent word) with an affixal nature (i.e. a bound affix) obligatorily attaching itself both syntactically and phonologically to an adjacent lexeme, as opposed to an affix, which has no full form with which it alternates.[5] I will henceforth refer to the reduced form as a possessive clitic and to the full form as a possessive pronoun. As I will later show, the possessive clitic, like the possessive suffix, obligatorily appears immediately after the possessee. The possessive suffix, however, has no full alternate form and will not be defined as a clitic, but rather as an affix. The full pronominal form has a broader distribution, including forms in isolation.

The two forms, the clitic and the pronoun, are often thought to be interchangeable, their distribution considered to be free, depending perhaps on the rate of speech (rapid speech

---

[4] See §2.
[5] For extensive discussion of clitics and their phonological status, see §2, where I will also discuss the rationale behind my modified definition of clitics.

→ optional reduced form) or register (informal register → optional reduced form). In this paper, I will show that not only does the distribution of the forms have little to do with the rate of speech or register, but their distribution is complementary – i.e. there is no free variation. Regarding the rate of speech, possessive pronouns appear in both rapid and slow speech. The same is true for possessive clitics. The length of the segments, which depends on the rate of speech, in the reduced forms is often no shorter than the length of the segments in the full forms. In fact, several reduced forms are twice as long as some of the pronouns. Insofar as the register is concerned, both speakers in the primary corpus analysed herein (see §1) use the full forms and the reduced forms. However, there is no apparent change of register which would trigger the change of the form used. An interesting example is (29) in §5.1.2.1, in which a television interviewer (a supposedly high register) uses the contracted and full forms alternately.

The use of the full or reduced pronominal possessives (pronouns or clitics), I will claim, is constrained by several factors. While, the syntactic structure may have an affect on determining whether the reduced form can be used, I will show that there are pragmatic and phonological parameters which govern the distribution of the various forms. It is the pragmatics-phonology interface, in particular the connection between phonological phrasing and Ariel's (1990) Accessibility Theory, which is the deciding factor when selecting the form of the pronominal possessive.

In §1, I will present the initial data. In §2, I will deal with the phonological aspects of the reduction in light of current theories regarding the phonology-syntax interface, primarily Selkirk's (1995). I will show how the various approaches to this interface cannot adequately explain the clitic-pronoun distribution. In §3, I will present further data. I will suggest some pragmatic criteria, such as the animacy of the antecedent or the distance between the antecedent and its anaphor, and show their effect on the selection of the form of the possessive. In §4, I will draw some intermediate conclusions. I will then move on to an analysis of the phenomena according to Accessibility Theory in section §5, assuming Ariel's (2000) basic assumption that possessive NPs are essentially no different from other NPs. In the final section, §6, I will present conclusions and discuss the pragmatics-phonology interface.

1. The data[6]

The data analysed are primarily from a corpus which consists mainly of dialogues between two close acquaintances (women).[7] All the statistical analyses are based on these dialogues and all the examples are taken from this corpus unless otherwise stated. All transcriptions are my own. Additional data are used for the theoretical background.

Third person forms will initially be presented separately from first/second person forms, since several aspects of the two groups are inherently different (such as humanness and, as is often the case, physical presence). Still, I will later demonstrate how it is possible to do away with distinctions regarding person and explain the complementary distribution of the possessives (full NPs, pronouns and clitics) – both nominal and pronominal – regardless of person.

Third person possessives: Of the 153 third person Possessives, 71 (46.4%) include full NPs, while the remaining 82 (53.6%) are pronominal forms. All in all, 51.2% of the pronominal third person forms are clitics.

Table 2: Distribution of third person pronouns and clitics

Form	Total	Pronoun		Clitic		% of Forms Reduced
ʃel+NP	71	---		---		---
3P-sg-masc	49	ʃelo	27	ʃlo	22	44.9%
3P-sg-fem	18	ʃela	9	ʃla	9	50%
3P-pl-masc	14	ʃelahem	3	ʃlahem	11	78.6%
3P-pl-fem	1	ʃelahen	1	ʃlahen	0	0%

Examples: All examples are presented as follows. The speaker's pseudo-name appears in the left-hand column. The text in italics in the second column is the phonetic representation of the speech, under which a gloss appears. The translation of the text appears in the third column. Every line represents a new intonation unit:[8]

---

[6] Special thanks to Prof. Shlomo Izreel for providing me with the data of natural conversation.
[7] For details regarding the transcription method employed, see Appendix I.
[8] See Appendix II for discussion of intonation units.

(1) ʃel+NP – of+NP

Vered:		*ma ze*

		What this									What's this?

		[ze] - -

		This										Is this…?

Nili:		*[lo]*

		No										No

		ze sxug ʃe ima ʃel nir asta

		This sxug that mother **of Nir** made			It is sxug that **Nir's** mother made.

(2) ʃelahem – their-masc. (full) ; ʃleem – their-masc. (reduced)

Nili:		*kʃe anaʃim medabrim*

		When people speak							when people are speaking

		laasot eze ʃehu nisuj al eh

		To-do some kind experiment on eh			To do some kind of experiment on

		al anaʃim$_i$

		On people$_i$									On people$_i$

		ex hem$_i$ medabrim

		How they$_i$ talk								How they$_i$ talk

		ve al ha safa ʃelahem$_i$

		And on the language **their**$_i$				And on **their**$_i$ language

		ve al orax ha xayim ʃlahem$_i$

		And on way the life **their$_i$**				And **their$_i$** way of life

<u>First/Second person possessives</u>: Of the 166 first/second person possessives, 75 (45.2%) are pronouns while 91 (54.8%) are clitics.

<u>Table 3: Distribution of first/second person pronouns and clitics</u>

Form	Total	Pronoun		Clitic		% of Forms Reduced
1P-sg	108	ʃeli	28	ʃli	80	74.1%
2P-sg-masc	16	ʃelxa	16	ʃxa	0	0%
2P-sg-fem	12	ʃelax	11	ʃlax	1	8.3%
1P-pl	29	ʃelanu	19	ʃlanu	10	34.5%
2P-pl-masc	1	ʃelaxem	1	ʃlaxem	0	0%
2P-pl-fem	0	ʃelaxen	0	ʃlaxen	0	0%

Examples:

(3) ʃeli – my (full) ; ʃl – my (reduced)

Vered: *lo   hajiti ba   xayim ʃeli ba   ʃuk*

Not I-was in-the life   **my** in-the market   I've never in my life been to the market.

Nili: *ba   karmel?*

In-the Carmel?   To the Carmel (market)?

Vered: *ba   xayim ʃl   lo hajiti be ʃuk   ha*
          karmel

In-the life   **my** not I-was in market the   I've never been to the Carmel market.
          Carmel

(4) ʃelaxem – your-plural-masc. (full) ; ʃlanu – our (reduced)

Vered: *bar yayin po*

Bar wine   here   A wine bar (near) here.

        lejad ha   bayit ʃelaxem

Near   the   house **your**   Near **your** house

Nili: *lo   naxon*

Not   true   You're kidding.

        efo   lejad ha   bajit ʃlanu?

Where near   the   house **our**?   Where near **our** house?

2. Phonological reduction and the phonology-syntax interface

What exactly constitutes a reduced form? As I mentioned in §0, the length of the segments does not determine whether a form is full or reduced. Segment length depends primarily on the rate of speech and since pronouns and clitics appear in both slow and rapid speech, the length of the segments varies accordingly.

It is the number of the segments rather than their length which determines whether the form is reduced or not. All the possessive clitics lack the unstressed /e/ vowel which appears in all the possessive pronouns. The deletion of unstressed /e/ vowels in Hebrew is common in certain phonologically conditioned environments. However, in the cases before us, the deletion cannot be explained by different environments simply because they are not phonologically different (see, for example, (7) in §2.2).

Since there are no apparent phonological differences between the environments of the two forms which could explain the /e/ deletion, the reduction of the possessive pronouns to possessive clitics must be conditioned by something other than the phonological environments in which the forms appear.

A central issue to this study is the prosodic representation of the various possessive forms (particularly the pronoun and clitic). In this chapter, I will present various analyses of the phonological phrase and the phonological word, outlining different views of the syntax-phonology interface. The syntax-phonology interface has been well documented in the past (see, for example, Beck 1999, Inkelas and Zec 1995, Odden 1987, Peperkamp 1996, Selkirk 1986 & 1995). The principal source of evidence for its existence is the phonological processes which appear to operate over syntactically defined domains, showing that syntactic structures may be relevant to phonological rules. In addition, interactions between syntax and phonology have also been shown in the opposite direction - i.e. phonological constraints affecting syntactic structures.

All theories discussing the phonology-syntax interface make one major assumption: The bracketing of the phonological words and phrases is affected by the syntactic bracketing. As I mentioned above, because there are no differences in the phonological environments in which the possessive pronouns and the possessive clitics appear, it

must be something other than these environments which triggers the reduction. It is necessary to assume, therefore, a difference in the bracketing (i.e. the phonological phrase structure).

There are two major approaches to the nature of the phonology-syntax interface. One possible approach, as presented by Odden (1987), is the direct access approach in which phonological rules are governed directly by syntactic relations, such as c-command or types of syntactic phrases.[9] For example, Odden (1987: 29) suggests rules such as a vowel lengthening rule in Kimatuumbi in which a word-final vowel is lengthened before a disyllabic noun if there are no segments or sentential brackets between the two: **V$\rightarrow$VV / __ X # [CVCV]$_{NOUN}$ (X contains no segments and no]$_s$ or $_s$[)**

Inkelas and Zec (1995), among others, adopt another possible approach, the majority view among researchers, in which the phonological components do not access the syntactic structure directly. Rather, there is an intermediate level of representation. The impoverished nature of the syntactic information relevant to phonological processes and the variety of mismatches between phonological rule domains and syntactic constituency argue for assuming this additional level of representation. The mapping of the phonological domains according to the syntactic domains could be relation-based (e.g. heads or complements) or edge-based (e.g. phonological phrase junctures are placed at the left or right edge of designated left/right syntactic constituents of a selected rank, such as syntactic phrases or phrasal heads).

The constituency of the phonological structure is distinct from that of the syntactic structure, and though possibly related to one another, they are not one and the same. This view was first taken by Selkirk in 1978 and developed in Selkirk (1986). The phonological structure is composed of a hierarchy of constituents, the Prosodic Hierarchy, in which the phonological word (not necessarily isomorphic with the syntactic word) is dominated by the phonological phrase which, in turn, is dominated by the intonational phrase (IP) and then by the utterance.[10] The phonological word dominates feet which dominate syllables. Each phonological rule has a specific prosodic

---

[9]I will not elaborate on this approach.

domain in which it applies and these domains are supposedly constructed on the basis of the syntax.

The status of the IP has been seen by some to be directly related to syntactic structure, an approach I will not adopt.[11] Others, such as Selkirk (1986), assume a more semantic or even pragmatic role for intonational phrasing. On the other hand, it is claimed that the phonological word and the phonological phrase are uncontroversially morphosyntactically defined structures (Inkelas and Zec, 1995).

Beck (1999) takes the view that looking at strings of clitics and words is not sufficient in order to parse the phonological matter into phonological words, phonological phrases and intonational phrases. Additional attention has to be paid to semantic structures. Phonological phrases do not necessarily conform directly to syntactic constituents. In many cases, the prosodic environment and certain semantic considerations may define how to treat a lexical item prosodically. Lexical classes and syntax are not sufficient. A general rule of the thumb is that predicative words ("content" words, open class items) act as phrasal heads in phonological phrases (i.e. they are "words"). In some cases in Beck's (1999) data (from narratives in the Salishan language Lushootseed spoken in British Columbia), the phonological status of words is manipulated for pragmatic purposes. Certain grammatical items, such as deictics or particles may act as words, thereby serving as phrasal heads, due to emphatic lengthening. Pragmatic or discourse related factors play a role in determining whether or not an element is treated as a phonological word or as a clitic. For example, deictic clitics (as he defines them) are treated as phonological words when setting the topic for an ensuing stretch of discourse.[12]

Before I can discuss the structure of the possessive constructions in Hebrew, I will address the nature of its components, in particular the pronominal elements - the clitics and the pronouns.

---

[10]Though evidence for the phonological necessity to refer to units larger than the intonational phrase, such as the utterance, is problematic.

[11] See Appendix II for discussion of IPs.

[12] Not at all surprising when one assumes the theoretical framework in §5. This will be discussed then.

2.1. Clitics and pronouns

A certain asymmetry in the phonological behaviour of content v. function words has long been noticed (Selkirk – 1995, Inkelas and Zec – 1995 among others). Inkelas and Zec (1995) present an approach that only the open classes (nouns, verbs, adjectives) can acquire the state of phonological words. The closed classes (including pronouns) are not mapped into phonological words, with the exception of cases of contrastive emphasis. In such cases, closed class items may receive the same degree of word stress that content words exhibit. Otherwise, these function words are cross-linguistically known to be exempt from word-level rules and to violate morpheme structure constraints (such as minimal prosodic word size).

Peperkamp (1996) discusses the hybrid phonological behaviour of clitics. Some clitics, it is claimed, are similar to affixes in that they undergo word-level rules, while others undergo rules applicable in between independent words (i.e. are treated as "words" rather than "affixes").

What exactly is a clitic, insofar as phonology is concerned? Peperkamp (1996) presents several characteristics of clitics as viewed by her. Clitics universally lack stress, cannot appear in isolation or form independent prosodic words. The binarity requirement imposed on prosodic words in many languages (i.e. a word is a at least a disyllabic or bimoraic foot) is repeatedly violated by clitics.

Based on the above views of clitics, on Comrie's (1989) definition of clitics and Haiman's (1991) characterization of clitics (§0), we can conclude a number of things. Phonologically, clitics seem to behave similarly to affixes. What then is the difference between clitics, such as the possessive clitic in Hebrew, and affixes, such as the possessive suffix in Hebrew? The former has a non-clitic version, i.e. it is a reduced alternate form of a full grammatical item with an affixal nature. It obligatorily attaches itself both syntactically and phonologically to an adjacent lexeme and cannot exist in isolation. Since some affixes attract stress while others do not, and, as we know, clitics are invariably stressless, we could define them as stressless affixes alternating with a full grammatical item, as opposed to an affix which has no full form with which it alternates.

2.2. The prosodic structure of possessive clitics and possessive pronouns

Selkirk (1995) presents an analysis of function words as being prosodized either as prosodic words or as one of three different types of prosodic clitic, defined by her as a "morphosyntactic word which is not itself a prosodic word". The central claim is that the options in the surface prosodization of the function words reflect the manner in which they are organised into prosodic words in the sentence. Whether or not a function word appears as a prosodic word or a clitic depends on the interaction of constraints on prosodic structure.

Selkirk raises the same question addressed here. Why, in the same language, do function words appear with different surface prosodizations? The answer, according to Selkirk, is that language particular constraints are responsible for deriving the variety of surface prosodic structures. Based on data in English, for example, the full "strong" forms of function words appear when the word is in isolation. Insofar as stress and vowel quantity/quality are concerned, such forms are indistinguishable from lexical items. The "strong" forms also surface when the function word is focussed or phrase final. The reduced "weak" forms, it is claimed, appear when the function word is neither focussed nor phrase final. In these cases, the function words are stressless, vowels are reduced and other phonological processes occur.

For example, below in (5), the possessive is, essentially, in isolation, as it appears without the possessee. Therefore, following Selkirk's view, it should be "strong" – i.e. a full pronoun:

(5) ʃeli – my (full) ; ʃelxa – your-masc.-singular (full)

Yoel:	*lo*	
	No	No.
	*ze **seli***	
	It **mine**	It's **mine**.
Nili:	*naxon*	
	Correct	Correct.
	*ze **selxa***	
	It **yours**	It's **yours**.

(6) below is an interesting case. The entity to which the possessive pronoun [ʃela] 3P-sg-fem refers immediately follows the possessed NP [bajit] 'house'. However, [bajit] 'house' is stressed. Stressed words are often said to be in a phonological phrase of their own (Selkirk 1995 ; see §2). Other words, both before and after the stressed word, cannot be phrased together with it. Therefore, the pronominal possessive in (6) cannot, in fact, be phrased together with the possessee in the same phonological phrase and is, in effect, isolated:

(6) ʃela – her (full)

Vered:	*[efo hi melamedet anglit]?*	
	Where she*ᵢ* teach English?	Where does she teach English?
Nili:	*ba bajit ʃelaᵢ*	
	In-the HOUSE[13] **her***ᵢ*	In **her***ᵢ* house
	ba siraxon	
	In-the stench	In the stench.

Selkirk continues by discussing object pronouns. These are different from the other closed class items discussed by Selkirk in that they are referential expressions similarly to possessive NPs (as opposed to auxiliary verbs or prepositions which are not referential). These, she claims, are a special case. They may appear either as strong or weak forms (apparently, regardless of stress). In the latter case, they are phonetically realised similarly to word-final stressless syllables. In the former case, they are realised similarly to other objects of the verb. If the pronoun surfaces as a weak form, it does not have the status of a prosodic word but rather that of an affixal clitic.

At this point, a question might be raised as to why object pronouns (or, as I will claim, pronouns in general) have the option of appearing in either of two prosodic configurations. Selkirk explains that in Romance languages and Arabic, for example, the object pronouns are morphosyntactic clitics, obligatorily forming a constituent with the verb and subsequently analysed as clitics dominated by an adjacent prosodic word.[14]

---

[13] This word has emphatic stress.

[14] In my view, however, these are not clitics, but rather affixes, since there is no "full" version with which they alternate.

Selkirk claims that this structure is optionally available for object pronouns in English. The difference between the two forms of the object pronouns in English is a result of their different prosodic structure configurations, different phonological bracketing (Selkirk 1995: 450/461):

Diagram 1: (a) The pronoun (Function Word) is a prosodic clitic of the affixal variety ; (b) The pronoun is a Prosodic Word:
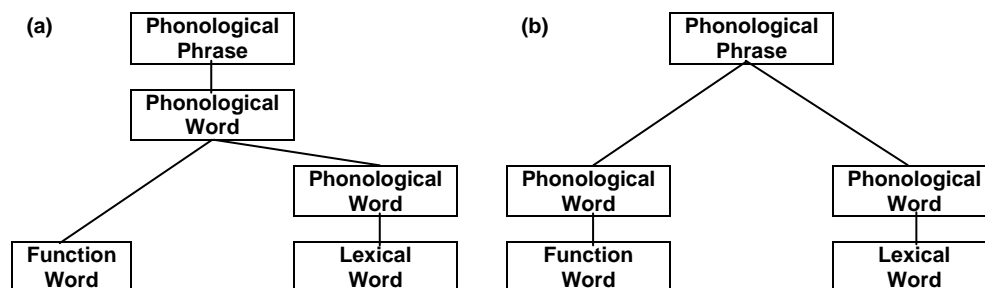
Apparently, these two options exist for Hebrew pronominal possessives as well.[15] Since the form of the possessive is determined by the phrasal bracketing, it is essential to determine which prosodic structure exists in a given case in order to know whether the pronoun is an independent prosodic word or an affixal clitic. How can one determine which structure is available in a given context?

As example (7) below shows, the phonological bracketing is not solely dependent on the syntax. Two identical syntactic structures have different prosodic bracketing:

(7) ʃx – your-fem. (reduced) ; ʃli – my (reduced) ; ʃeli – my (full) ;

Vered:	*bar yayin po*	
	Bar wine here	A wine bar (near) here.
	*lejad ha bayit **ʃelaxem***	
	Near the house **your**	Near **your** house
Nili:	*lo naxon*	
	Not true	You're kidding.
	*efo lejad ha bajit **ʃlanu**?*	
	Where near the house **our**?	Where near **our** house?

---

[15] Possessives in Hebrew may be monosyllabic (singular forms) or disyllabic (plural forms), depending on whether they are derived from disyllabic (singular) or trisyllabic (plural) pronouns. Therefore, the structures as presented in diagram 1 above must allow for polysyllabic function words, something which Selkirk (1995) does not do. Furthermore, the constituents' linear order in Hebrew is the mirror image of that in the diagram.

In the above example, the syntactic structures of [ima ʃli jada] 'my mother knew' and [aba ʃeli lo jada] 'my father didn't know' are identical insofar as the position of the possessive is concerned.[16] Immediately, it becomes apparent that while the structuring of phonological phrases could possibly be syntactically conditioned, this certainly is not sufficient in order to define the phonological domains in which processes, such as reduction and the pronoun-clitic alternation, occur. It is clear that other non-syntactic considerations need to be taken into account. Since there is no apparent syntactic difference in some cases which could account for the different bracketing, I can only assume that it is not necessarily the syntax which determines the bracketing. Logically, either the phonological phrase's bracketing is affected by some non-syntactic factors, or it is purely random.

The question remains thusfar unanswered: Do the different prosodic configurations (and, subsequently, the different forms of the possessives) alternate freely? Or is the distribution of the two affected by some non-phonological phenomena? Simply put, are the clitic and the pronoun in complementary distribution, and if so, how exactly can one define the environments in which each of the forms appears?

Adopting Selkirk's description of the two different prosodic structures of the possessive clitics and the possessive pronouns, I will suggest an analysis in the following sections and show that not only is the IP determined by pragmatic and semantic considerations, but the phonological phrase and phonological word are also affected by pragmatic and semantic factors.

---

[16]There is no reason to assume that [lo] 'not' affects the syntactic structure of the previous NP. Neither is there a difference in the intonation or stress pattern which might trigger the different bracketing.

3. Different factors affecting the form of the possessives

As the data in the previous sections may suggest, the current analyses are insufficient to fully explain the phenomena under discussion. The syntactic structure is not sufficient to predict the phonological status of closed class items. We must consider the pragmatic or semantic properties of closed class items in order to define their phonological status.

In this section, I will discuss various pragmatic factors which have been suggested in order to explain the distribution of various grammatical items. I will show that although these factors do indeed play a role in determining the surface form of pronouns in general and possessives in particular, no single factor is sufficient.

The factors I have analysed are:

1.   Humanness of possessor – §3.1.
2.   Topicality of possessor – §3.2.
3.   Physical presence of possessor – §3.3.
4.   Distance between possessor and its antecedent - §3.4.
5.   Syntactic role of antecedent – §3.5.
6.   Adjacency of possessor and possessee – §3.6.

In the analysis of the first/second person forms, two important criteria are irrelevant in determining the distribution of possessive pronouns and possessive clitics - the humanness of the entity referred to and its physical presence - since all pronouns in these groups are both human and physically present.[17] While there may be differences in the distribution of the full and reduced forms when considering gender and number, there are currently insufficient data to determine this.[18]

3.1. Humanness of entity referred to

Our world is an anthropocentric one. Therefore, it is only natural that animacy and humanness should play a role in grammar. Indeed, it has long been accepted that

---

[17]The only exceptions would be plural forms including both people present and people not present. Many of the first person plural forms were of this type. However, there are insufficient data to determine whether the various types of plural forms do, in fact, behave differently regarding reduction.

[18]There are no morphological gender distinctions in Hebrew insofar as first person forms are considered. The second person plural feminine form is virtually non-existent in Hebrew (the second person plural masculine form is used instead).

animacy, in general, and humanness, in particular, play such a role. Comrie (1989) describes animacy as an extralinguistic property manifested in the structure of languages. A hierarchy is suggested as follows: HUMAN>ANIMAL>INANIMATE. This hierarchy is thought to interact with other linguistic hierarchies (such as definiteness) and with the syntactic positions an entity is likely to hold. For example, animates statistically prefer transitive subject and indirect object positions.

A further point raised by Comrie (1989: 188) is the treatment of first and second person pronouns. These may be treated as more "animate" in some languages, even though in the literal sense, they are not more or less human or animate than other human NPs. As Comrie put it, "the speech act participants are necessarily high in animacy, because human, they are no more animate, in the literal sense, than are other noun phrases with human reference, yet their behaviour is differentiated". It is not clear whether by saying this, Comrie is in fact referring to animacy per se, without taking other factors into consideration (such as salience, topicality and – as I will show in §5 – accessibility). It is counter-intuitive, in my opinion, to claim that NPs referring to human beings are less animate than first or second pronouns referring to the same entities.

Comrie proposes that the relevant hierarchy might not be one of animacy, but rather one of topic worthiness. Although the two correlate to a very high degree, he claims, topic worthiness would distinguish between first and second person, whereas the animacy hierarchy would not, and the data seem to support the latter view rather than the former. The data in Hebrew I have presented thusfar indeed support differentiating between first and second person pronouns and other referential expressions, though it is not clear that animacy is the basis for this differentiation.

Another possibility Comrie raises is that it is salience rather than animacy which is relevant. He concludes this discussion by suggesting that salience is not a primitive, but rather a complex notion resulting from the interaction among a number of factors, such as definiteness, concreteness and, of course, animacy. It is this approach of Comrie's which I will discuss at length in §5.

Dahl & Fraurud (1996) present data from Swedish highly relevant to the current discussion, which show that the preposed NP-modifiers (genitives and possessive pronouns) are extremely likely to be human/animate NPs. Regarding the use of pronouns, they add that a strong connection exists between the animacy of a referent and the referring expression used. First/second persons, for example, are almost invariably human, whereas third persons may be either human or non-human. Animates (in particular human NPs) display a propensity to being used as pronouns more so than inanimates. The greater the distance between an entity and its pronominal anaphoric expression, the more likely it is to be human.

The following table contains the data regarding the third person possessives, excluding the analytic ʃel+NP form.

Table 3: Third person possessives and humanness

Form	Total	Pronoun		Human Antecedents		Clitic		Human Antecedents	
3P-sg-masc	49	ʃelo	27	17	(63%)	ʃlo	22	16	(72.7%)
3P-sg-fem	18	ʃela	9	6	(66.7%)	ʃla	9	9	(100%)
3P-pl-masc	14	ʃelahem	3	3	(100%)	ʃlahem	11	11	(100%
3P-pl-fem	1	ʃelahen	1	0	(0%)	ʃlahen	0	--	
Total			**40**	**26**	**(65%)**		**42**	**36**	**(86%)**

While 47.9% of the full NP possessives (not represented in Table 3) refer to human entities, 65% of the possessive pronouns refer to human entities. There is a dramatic rise in the percentage of human entities for the possessive clitics - 85.7% of them refer to human entities. The importance of the humanness of the entity referred to is clear. Full NPs are just slightly more likely to refer to non-human entities than they are to refer to human entities. Possessive pronouns favour human entities (65% as opposed to 35% for non-humans). But the preference for human entities for possessive clitics is overwhelming - 85.7% as opposed to 14.3%.

Interestingly, though not in the least surprisingly, the feminine and plural forms demonstrate this tendency even more extremely. The humanness of the entity referred to may not be the sole factor in determining the form selected. Its gender and number may be crucial too. While the number of such referents in the corpus is quite low (and the

statistics, therefore, less accurate), the fact that 100% of the reduced feminine and plural

forms refer to humans is striking.

Note examples (8) and (9):

(8) ʃlo – his (reduced)

Gur: *haja li   xaver$_i$ be kurs XXX*
          Was to-me friend$_i$ in   course XXX   I had a friend in XXX course

          ʃe   aba   ʃlo$_i$ haja meavteax ʃel eh
          That father **his**$_i$ was   bodyguard of eh   **Whose**$_i$ father was a bodyguard of eh-

          moʃe dajan
          Moshe Dayan   Moshe Dayan.

(9) ʃela – her (full) ; ʃelahen – their-fem. (full)

Yael: *samti lax   po kaseta kvar   ptuxa me ha*
                najlon   ʃela$_i$
          I-put   for-you here cassette already open   from the   I have already put a cassette here
                cellophane **its**$_i$ for you removed from **its**$_i$
                                                                        cellophane

          ve samti lax   gam et   ha batareot ptuxot
                me ha najlon ʃelahen$_k$
          And I-put for-you also   Acc. the batteries   open   And I've also put the batteries
                from the cellophane **their**$_k$ (here) for you removed from
                                                                        their$_k$ cellophane

Insofar as the humanness criterion is concerned, the two cases above, [ʃlo] 3P-sg-masc

in (8) and [ʃela] 3P-sg-fem in (9), are near minimal pairs. The possessive in (8) is a

clitic while that in (9) is a pronoun. This can be motivated by the fact that the pronoun

in (8) refers to a human entity whereas that in (9) refers to a non-human entity.

The data in (10) and (11) are not clear insofar as the humanness criterion is concerned:

(10) ʃelo – his (full) ; ʃlo – his (reduced)

Vered: *ma   hi   asta la   xatul$_i$ seli*
          What she did   to-the cat$_i$ mine   What did she do to my cat$_i$?

Nili: *gadol*
          Great   Great.

hu_i madhim
He_i wonderful   It's_i wonderful.

*tidi   lax   ʃe ani kol kax ohevet
          oto_i*
You know to-you that I   so much love   You should only know how much I
          it-Acc._i   love it_i.

*lamrot   ʃe   ha mikum **selo**_i lo tov.*
Although that the location **its**_i   not good   Although **its**_i location isn't good.

et   ha   xum
Acc. The brown   The brown.

*ha mikum **ʃlo**_i lo [maʃehu]*
The location **its**_i not something   **Its**_i location isn't wonderful.

Vered: *XXXXXXX haja xamud po at jodaat davka*
         XXXXXXX was cute   here   you know   XXXXXXX would have been cute
                                                                          here, you know?

         [[XXXX]]
         [[XXXX]]

Nili: *[[ken vered]]*   Yes, Vered?
         [[yes vered]]?

Vered: *roca lenasot ulay*
         Want to-try   maybe   Would you like to try maybe?

Nili: *ani azbir   lax   ma ha beaya*
         I   will-explain to-you what the problem   I'll explain the problem to you.

         *[ʃe ha xaka **ʃelo**_i]*
         [that the rod **its**_i]   **Its**_i rod

Vered: *[XXXXXXXXX]*
         [XXXXXXXXX]

Nili: *lo*
         No   No

         *ha xaka **ʃlo**_i*
         The rod **its**_i   **Its**_i rod

         hu haja kvar   al ha madaf ʃam
         He was already on the shelf   there   It was already on the shelf there

(11) ʃelahem – their-masc. (full) ; ʃleem – their-masc. (reduced)

Nili: *kʃe   anaʃim medabrim*

When people   speak   when people are speaking

laasot eze   ʃehu   nisuj   al eh

To-do some kind   experiment   on eh   To do some kind of experiment on

al anaʃim$_i$

On people$_i$ On people$_i$

ex   hem$_i$ medabrim

How they$_i$ talk   How they$_i$ talk

*ve al ha   safa   **ʃelahem**$_i$*

And on the language **their**$_i$ And on **their**$_i$ language

*ve al orax ha xayim **ʃlahem**$_i$*

And on way the life   **their**$_i$ And **their**$_i$ way of life

In (10), possessive pronouns and clitics are used to refer to a non-human entity (the wooden cat). The first possessive is a pronoun, the second a clitic, the third a pronoun and the fourth a clitic. This behaviour would be strange (at best) if only the humanness criterion were to be considered. In (11), a possessive pronoun is used for the initial anaphoric reference to a human antecedent, followed by a possessive clitic referring to the same antecedent.[19]

To conclude, possessors in general can be either human or non-human (the former being far more common than the latter overall). Full NP possessives are preferred (marginally) when referring to non-humans. The majority of the pronominal possessives refer to humans. Possessive clitics display an overwhelming tendency to refer to human entities - a tendency which increases for feminine and plural forms. Clearly, while humanness, gender and number play a central role in determining the form of the possessive used, they are insufficient to determine whether a pronoun or clitic is to be used.

3.2. Topicality of entity referred to

A precise definition of what constitutes a topic is beyond the scope of this thesis. In my use of the term "topicality", I am not referring to a sentential topic, but rather to the discourse topic. Concrete methods for defining such a topic, such as Arnold's (1997) ad hoc definition in her experiments – "a referent that was repeated in three consecutive

---

[19] Both possessives are phrase final and the intonation patterns are identical.

sentences" – are problematic. Therefore, following Ariel (1990), I have used the notion quite intuitively to refer to entities which are predicated on in the foreground of the conversation.

The following tables contain the data regarding the third person possessives (excluding the analytic nominal ʃel+NP form) and the first/second person possessives.

Table 4: Third person possessives and topicality

Form	Total	Pronoun		Topic	Clitic		Topic
3P-sg-masc	49	ʃelo	27	17 (63%)	ʃlo	22	19 (86.4%)
3P-sg-fem	18	ʃela	9	9 (100%)	ʃla	9	9 (100%)
3P-pl-masc	14	ʃelahem	3	3 (100%)	ʃlahem	11	11 (100%)
3P-pl-fem	1	ʃelahen	1	1 (100%)	ʃlahen	0	--
Total			**40**	**30 (75%)**		**42**	**39 (93%)**

Table 5: First/Second person possessives and topicality

Form	Total	Pronoun		Topic	Clitic		Topic
1P-sg	108	ʃeli	28	3 (11.1%)	ʃli	80	19 (23.8%)
2P-sg-masc	16	ʃelxa	16	0 (0%)	ʃxa	0	--
2P-sg-fem	12	ʃelax	11	0 (0%)	ʃlax	1	1 (100%)
1P-pl	29	ʃelanu	19	0 (0%)	ʃlanu	10	0 (0%)
2P-pl-masc	1	ʃelaxem	1	0 (0%)	ʃlaxem	0	--
2P-pl-fem	0	ʃelaxen	0	--	ʃlaxen	0	--
Total			**75**	**3 (4%)**		**91**	**20 (22%)**

In the case of third person referring expressions, there is an overwhelming preference for pronominal possessives when referring to topics. 84.1% of the pronominal possessives indeed refer to topics as opposed to 15.5% of the full NP possessives referring to topics. (12) is an example of a possessive having a full NP form when referring to a non-topic:

(12) ʃel+NP – of+NP

    Vered: *ma   ze*
               What this   What's this?

                [ze]- -
                This   Is this…?

    Nili: *[lo]*
                No   No

                *ze sxug ʃe ima   **ʃel nir** asta*
                This sxug that   mother **of Nir** made   It is sxug that **Nir's** mother made.

On the other hand, (13) is a case in which the topic is the possessor, and is then a pronominal possessive:

(13) ʃla – her (reduced)

Vered:	*hajta rut dajan*	
	Was **Ruth Dayan**[i]	**Ruth Dayan**[i] was there.
	*ha ben **ʃla**[i] asa laxem et ha ʃulxan*	
	The son **hers**[i] made for-you Acc. the table	**Her**[i] son made your table.

The comparison between the possessive pronouns and the possessive clitics is not as clear. When comparing the possessive clitics to the possessive pronouns, it seems that the topicality of the entity referred to plays a lesser role. With the exception of the third person masculine singular possessive, all third person pronominal possessives – whether pronouns or clitics - refer to topics.[20]

The third person masculine singular possessive shows a slight preference for the clitic form when referring to topics, though there are even some possessive clitics (not to mention possessive pronouns) which refer to non-topics. These discrepancies need to be addressed - and it seems that the topicality of the entities is insufficient to do so.[21] In (14) and (15), the possessives refer to third person plural topics. In (14), both pronominal possessives are clitics, whereas in (15), only the second is a clitic:

(14) ʃleem – their-masc. (reduced)

Vered:	*at lo mevina ʃe ze tarbut magila me ha bxina hazot*	
	You not understand that it culture disgusting from the aspect this	Don't you understand that it's a disgusting culture from this aspect?
	*at tsrixa lirot ex hem mitjaxsim la naʃim **ʃleem***	
	You must to-see how they treat to-the women **their**	You should see how they treat **their** women.

---

[20]Recall the discussion of gender and number in previous section. Gender and number play a central role in determining the form of the possessive used. This is relevant here too.

[21]It should, of course, be noted that the sheer number of the third person masculine singular possessive (almost 60% of all third person possessives) could partially explain the discrepancy (perhaps there are insufficient data for the other third person forms).

*kol ha naʃim **ʃleem** ba   XX*
All the women   **their**   on-the XX   All **their** women on the XX

(15) ʃelahem – their-masc. (full) ; ʃleem – their-masc. (reduced)

Nili: *kʃe   anaʃim medabrim*
When people   speak   when people are speaking

laasot eze ʃehu nisuj   al eh
To-do some kind   experiment   on eh   To do some kind of experiment on

al anaʃim$_i$
On people$_i$ On people$_i$

ex   hem$_i$ medabrim
How they$_i$ talk   How they$_i$ talk

ve al ha   safa   ʃelahem$_i$
And on the language **their**$_i$ And on **their**$_i$ language

ve al orax ha xayim ʃlahem$_i$
And on way the life   **their**$_i$ And **their**$_i$ way of life

The case with the third person is slightly puzzling. While it is clear that pronominal possessives are usually used to refer to topics and full NPs to non-topics, there are several cases in which this is not the case. Moreover, the clitics and possessive pronouns both seem to refer to topics in the majority of the cases, suggesting, perhaps, that the two are interchangeable and alternate freely.

Regarding the first/second person pronominal possessives in Hebrew, the immediate impression is that topicality has little or no effect on their reduction.[22] Since the use of a full possessive NP instead of a pronominal possessive is not an option with the first/second person, the question is only whether the possessive clitics are preferred over pronominal possessives for topics. Judging by the first person singular, it seems that there is a slight preference for the possessive clitics when referring to topics (there are too few possessive clitics for the second/plural possessives to draw any clear cut conclusions).

Note the following example (16). Vered, the first speaker, is the topic. Two pronominal possessives refer to the speaker – the first is a pronoun, while the second is a clitic:

---

[22]Which is basically the same finding for third person pronominals.

(16) ʃeli – my (full) ; ʃl – my (reduced)

Vered:	*lo hajiti ba xayim ʃeli ba ʃuk*	
	Not I-was in-the life **my** in-the market	I've never in my life been to the market.

Nili:	*ba karmelʔ*	
	In-the Carmelʔ	To the Carmel (market)?

Vered:	*ba xayim ʃl lo hajiti be ʃuk ha* *karmel*	
	In-the life **my** not I-was in market the Carmel	I've never been to the Carmel market.

On the other hand, in (17) below, Nili, the first speaker, is the topic. Two pronominal possessives refer to her – the first is a clitic, while the second is a pronoun:

(17) ʃli – my (reduced) ; ʃeli – my (full)

Nili:	*be gadol*	
	In big	In general
	histamaxti al maʃehu ʃe raiti paam *etsel safta ʃli ba bajit*	
	I-relied on something that I-saw once at grandmother **my** in-the house	I relied on something I once saw at **my** grandmother's.
	safta ha ʃnija	
	Grandmother the second	My other grandmother.
	aval eem	
	But eem	But eem
	xiduʃ ʃeli	
	Innovation **my**	It's **my** innovation.

If topicality affects the surface form of the possessive, the following example (18) presents some puzzling data. Three pronominal possessives (two first person and one second person) refer to the topic. The first and second are clitics. The third, however, is a first person possessive pronoun – a rare phenomenon at best, in particular when referring to topics:

(18) ʃli – my (reduced) ; ʃeli – my (full) ; Sx – your-fem. (reduced)

Nili:	*at ovedet alaj*	
	You kidding on-me	You're kidding me
	bat kama hajit?	
	How old you-were?	How old were you?
Vered:	*esrim*	
	Twenty	Twenty.
Nili:	*ve*	
	And	And
	*ha horim **ʃx** jadu?*	
	The parents **your** knew?	Did **your** parents know?
Vered:	*ima **ʃli** jada*	
	Mother **my** knew	**My** mother knew
	*aval aba **ʃeli** lo jada*	
	But father **my** not knew	But **my** father didn't know.

Almost 80% of the first person possessive clitics refer to non-topics - i.e. even if topicality plays a role here, it is most certainly not a very significant one. To sum up, topics seem to be referred to by pronominals. The data, however, suggest that whether the pronominals are clitics or pronouns cannot be determined merely on the basis of topicality. Other factors need to be addressed.

3.3. Physical presence of entity referred to

Clark et al (1983) suggests that whether or not an entity is physically present determines the form of the referring expression used. However, based on my data, I cannot confirm, for example, that there is a one-to-one relationship between physically present entities and certain pronouns (such as deictics) on the one hand as opposed to physically absent entities and other pronouns or NPs. The data show this is not the case. No clear connection between the form of the possessive and the physical presence of the entity it refers to can be established based on my data.

The following table contains the data regarding the third person possessives, excluding the analytic ʃel+NP form.

Table 6: Third person possessives and physical presence

Form	Total	Pronoun		Physically Present	Clitic		Physically Present
3P-sg-masc	49	ʃelo	27	12 (44.4%)	ʃlo	22	6 (27.3%)
3P-sg-fem	18	ʃela	9	3 (33.3%)	ʃla	9	0 (0%)
3P-pl-masc	14	ʃelahem	3	0 (0%)	ʃlahem	11	3 (27.3%)
3P-pl-fem	1	ʃelahen	1	1 (100%)	ʃlahen	0	--
Total			**40**	**16 (40%)**		**42**	**9 (21%)**

It is unclear what kind of role the physical presence of the entity referred to plays in determining the form of the possessive used. Approximately the same percentage of the pronominal forms (30%) and full NP possessives (29.6%) refer to entities present. Regarding the selection of the possessive clitic or possessive pronoun, 40% of the latter refer to physically present entities. Only 21.4% of the clitics refer to physically present entities - even lower than the percentage of the full NPs used.

There does not seem to be a direct correlation between the form of the possessive and the physical presence. This can be seen quite clearly in the following examples. In the following examples, Yoel (in (19)), the wooden cat (20), the cassette and the batteries (21) are all physically present. The speaker refers to Yoel with a full NP possessive, to the wooden cat with possessive pronouns as well as possessive clitics, and she refers to the cassette and the batteries with possessive pronouns:

(19) ʃel+NP – of+NP

Nili: *gur*
         Gur   Gur

         *raita   et   ha nalajim **ʃel joel***
         You-saw Acc.   the shoes   **of Yoel**   Have you seen **Yoel's** shoes?

Gur: *lo*
        No   No

(20) ʃelo – his (full) ; ʃlo – his (reduced)

Vered: *ma   hi   asta la   xatul$_i$ seli*
          What she did   to-the cat$_i$ mine   What did she do to my cat$_i$?

Nili: *gadol*
         Great   Great.

         hu$_i$ madhim
         He$_i$ wonderful   It's$_i$ wonderful.

tidi   lax   ʃe ani kol kax ohevet
         oto_i

You know to-you that I so much love	You should only know how much I
it-Acc._i	love it_{i.}

*lamrot   ʃe   ha mikum **selo**_i lo tov.*

Although that the location **its**_i not good	Although **its**_i location isn't good.

et   ha   xum

Acc. The brown	The brown.

*ha mikum **ʃlo**_i lo [maʃehu]*

The location **its**_i not something	**Its**_i location isn't wonderful.

Vered: *XXXXXXX haja xamud po at jodaat davka*

XXXXXXX was cute here you know	XXXXXXX would have been cute here, you know?

      [[XXXX]]
      [[XXXX]]

Nili: *[[ken vered]]*   Yes, Vered?
      [[yes vered]]?

Vered: *roca lenasot ulay*

Want to-try maybe	Would you like to try maybe?

Nili: *ani azbir   lax   ma ha beaya*

I will-explain to-you what the problem	I'll explain the problem to you.

      *[ʃe ha xaka **ʃelo**_i]*

[that the rod **its**_i]	**Its**_i rod

Vered: *[XXXXXXXXX]*
      [XXXXXXXXX]

Nili: *lo*
      No   No

      *ha xaka **ʃlo**_i*

The rod **its**_i	**Its**_i rod

      hu haja kvar   al ha madaf ʃam

He was already on the shelf there	It was already on the shelf there

(21) ʃela – her (full) ; ʃelahen – their-fem. (full)

Yael: *samti lax   po kaseta kvar   ptuxa me ha*
          *najlon   **ʃela**_i*

I-put for-you here cassette already open from the	I have already put a cassette here
cellophane **its**_i	for you removed from **its**_i cellophane

ve   samti lax   gam et   ha batareot ptuxot
me ha najlon ʃelahen_k

And I-put for-you also Acc. the batteries   open   And I've also put the batteries
from the cellophane **their**_k   (here) for you removed from
                                                        their_k cellophane

Perhaps redefining physical presence is necessary to better capture a generalization (if one exists).[23] One possibility would be the participation of the entity in the discourse and its designated discourse role (to differentiate between first/second persons and the third persons). But dividing the third person possessives according to physical presence per se seems to be insignificant.

3.4. The distance between the possessive and its antecedent

Is the possessive's form (analytic nominal NP, pronoun, clitic) affected by the distance between it and its antecedent? Ariel (1990, 2001) shows that the cohesion between an antecedent and its anaphor is affected by the distance between them. The greater the distance, the lower the degree of cohesion. By distance, Ariel (2001) does not refer to the distance in words, but rather episode boundaries. I will measure distance by counting IPs. A distinction was made between cases in which they appeared in the same IP or in adjacent IPs (0-1 IPs) and cases in which the distance was two IPs or more. Cases in which there is no discoursal antecedent are treated similarly to cases in which the distance is two IPs or more.

Table 7: The distance between the antecedent and the anaphor - third person possessives

	Form	Total	0-1 IPs	2+ IPs
Analytic nominal NP Possessive	ʃel+NP	71	4 (5.6%)	67 (94.4%)
3P-sg-masc pronoun	ʃelo	27	11 (40.7%)	16 (59.3%)
3P-sg-fem pronoun	ʃela	9	7 (77.8%)	2 (22.2%)
3P-pl-masc pronoun	ʃelahem	3	3 (100%)	0 (0%)
3P-pl-fem pronoun	ʃelahen	1	1 (100%)	0 (0%)
3P-sg-masc clitic	ʃlo	22	16 (72.3%)	6 (27.3%)
3P-sg-fem clitic	ʃla	9	3 (33.3%)	6 (66.7%)
3P-pl-masc clitic	ʃlahem	11	9 (81.8%)	2 (18.2%)
3P-pl-fem clitic	ʃlahen	0	0 (0%)	0 (0%)
Total		**153**	**54 (35.3%)**	**99 (64.7%)**

---

[23] See also §5.1.2 for further discussion of physical presence v. discoursal roles.

Table 8: The distance between the antecedent and the anaphor – first/second person possessives

	Form	Total	0-1 IPs	2+ IPs
1P-sg pronoun	ʃeli	28	6 (21.4%)	22 (78.6%)
2P-sg-masc pronoun	ʃelxa	16	7 (43.8%)	9 (56.2%)
2P-sg-fem pronoun	ʃelax	11	0 (0%)	11 (100)
1P-pl pronoun	ʃelanu	19	0 (0%)	19 (100%)
2P-pl-masc pronoun	ʃelaxem	1	0 (0%)	1 (100%)
1P-sg clitic	ʃli	80	44 (55%)	36 (45%)
2P-sg-masc clitic	ʃxa	0	0 (0%)	0 (0%)
2P-sg-fem clitic	ʃlax	1	1 (100%)	0 (0%)
1P-pl clitic	ʃlanu	10	0 (0%)	10 (100%)
1P-pl-masc clitic	ʃlaxem	0	0 (0%)	0 (0%)
Total		**166**	**58 (34.9%)**	**108 (65.1%)**

Although inconclusive, the data above show a connection between the form of the possessive used and the distance between it and its antecedent. When referring to third person entities, analytic nominal NPs are overwhelmingly preferred for larger (two or more IPs) distances – almost 68%. Just over 18% of the references over such distances are pronouns, and approximately 14% are clitics. For shorter distances (fewer than two IPs), only 7% of the references are made using analytic nominal NPs. About 41% of the references at this distance are pronouns and about 52% are clitics. The difference between analytic nominal NPs on the one hand and pronouns and clitics on the other hand is striking – the former are overwhelmingly preferred for larger distances and overwhelmingly dispreferred for shorter distances. However, insofar as the pronouns and clitics are concerned, the former are only slightly more frequent than the latter over larger distances and only slightly less frequent over short distances.

Although there is a tendency to prefer clitics to pronouns over short distances and pronouns to clitics over long distances, the situation with first and second person possessives (naturally, only pronouns and clitics are relevant) is also inconclusive. Approximately 57% of the possessives referring to antecedents over a long distance are pronouns, while 43% are clitics. For shorter distances, clitics are overwhelmingly preferred – almost 78%. While it may be possible to establish some sort of pattern – clitics for short distances, pronouns for long distance references, it is only a tendency. In addition, it should be noted that several of the long distance references for the first and

second person pronouns are, in fact, cases in which there is no discoursal antecedent whatsoever. In some of these cases, even clitics were used.

Once again, other criteria over and above the distance between the antecedent and the anaphor have to be incorporated into the analysis in order to determine the type of referring expression to be used.

3.5. The syntactic role of the antecedent referred to

Keenan & Comrie (1977) argue for an NP accessibility hierarchy predicting the susceptibility of NPs in various roles to undergoing syntactic processes, in particular relativization.[24] Subjects are shown to be more susceptible to relativization than direct objects. The latter are, in turn, shown to be more susceptible to the process than NPs in other roles and so on. This hierarchy of syntactic positions is claimed to reflect "the psychological ease of comprehension" of the NPs in the relevant positions. In addition, they suggest that referential pronouns should be initially interpreted as referring to NPs in a previous subject position "unless there are indications to the contrary", in which case a previous direct object position will be tried and so on.

Ariel (1990: 155 inter alia) discusses the correlation between her accessibility hierarchy and certain syntactic positions.[25] Topics are shown to be more likely than non-topics to be in a subject-position and, therefore, more accessible to syntactic processes.

In a study of third person human referential expressions (neutralizing the human and person factors), Halmari (1996) shows how pronouns in Finnish favour antecedents in subject-positions in 72.5% of the instances studied.

The following tables analyse the connection between the syntactic role of the antecedent and the form of the possessive used as anaphoric to it.

---

[24] They use the term "accessibility" to denote the susceptibility of NPs to syntactic processes – not to be confused with the same term I will later use (following Ariel's Accessibility Theory).

[25] See extensive discussion in §5.

Table 9: Third person possessives (analytic nominal NPs and pronouns) and the syntactic roles of their antecedents

Form	Total	Subject	% of Subject	Direct Object	% of Direct Object	Other[26]	% of Other	None[27]	% of None
ʃel + NP	71	4	5.6%	0	0%	0	0%	67	94.4%
ʃelo 3P-sg-masc	27	10	37%	5	18.5%	12	44.4%	0	0%
ʃela 3P-sg-fem	9	6	66.7%	3	33.3%	0	0%	0	0%
ʃelahem 3P-pl-masc	3	3	100%	0	0%	0	0%	0	0%
ʃelahen 3P-pl-fem	1	0	0%	1	100%	0	0%	0	0%

Table 10: Third person possessives (clitics) and the syntactic roles of their antecedents

Form	Total	Subject	% of Subject	Direct Object	% of Direct Object	Other	% of Other	None	% of None
ʃlo 3P-sg-masc	22	10	45.5%	6	27.3%	6	27.3%	0	0%
ʃla 3P-sg-fem	9	9	100%	0	0%	0	0%	0	0%
ʃlahem 3P-pl-masc	11	9	81.8%	0	0%	2	18.2%	0	0%
ʃlahen 3P-pl-fem	0	0	--	0	--	0	--	0	--

Table 11: First/second person possessive pronouns and the syntactic roles of their antecedents

Form	Total	Subject	% of Subject[28]	Direct Object	% of Direct Object	Other	% of Other	None	% of None
ʃeli 1P-sg	28	13	46.4%	0	0%	15	53.6%	0	0%
ʃelxa 2P-sg-masc	16	10	62.5%	0	0%	6	37.5%	0	0%
ʃelax 2P-sg-fem	11	0	0%	0	0%	11	100%	0	0%
ʃelanu 1P-pl	19	0	0%	0	0%	17	89.5%	2	10.5%
ʃelaxem 2P-pl-masc	1	0	0%	0	0%	1	100%	0	0%
ʃelaxen 2P-pl-fem	0	0	--	0	--	0	--	0	--

---

[26]Syntactic phrases (such as indirect objects, adverbial expressions, prepositional phrases) and syntactic positions (the effect of preposed phrases on salience) were not investigated - and were simply lumped together as "Other". There is no doubt in my mind that linear position is extremely important too, although much of the literature deals with the syntactic roles of entities. An additional and crucial point is simply that there are far more subjects than any other syntactic role. Furthermore, there are more direct objects than adverbials etc. Therefore, naturally, the number of pronouns referring to subjects and direct objects will be larger than the number referring to other roles due to their much larger number. All of these are definitely issues for further research.

[27] No linguistic antecedent.

[28]Including non-overt subjects. Many of the first/second person inflected verbs in the past tense ordinarily have no overt subject.

Table 12: First/Second person possessive clitics and the syntactic roles of their antecedents

Form	Total	Subject	% of Subject	Direct Object	% of Direct Object	Other	% of Other	None	% of None
ʃli 1P-sg	80	25	31.3%	0	0%	54	67.5%	1	1%
ʃxa 2P-sg-masc	0	0	--	0	--	0	--	0	--
ʃlax 2P-sg-fem	1	1	100%	0	0%	0	0%	0	0%
ʃlanu 1P-pl	10	0	0%	0	0%	10	100%	0	0%
ʃlaxem 2P-pl-masc	0	0	--	0	--	0	--	0	--
ʃlaxen 2P-pl-fem	0	0	--	0	--	0	--	0	--

In my data, 94.4% of the full NP possessives used have no linguistic antecedents. The few that do have antecedents, refer to entities in subject-position. 47.5% of the possessive pronouns refer to antecedents in a subject position. 22.5% refer to antecedents in a direct object position. 66.7% of the possessive clitics refer to a subject position. 14.3% refer to antecedents in a direct object position.

While the percentage of third person possessive pronouns referring back to entities in a subject-position is not nearly as high as the data from Finnish given by Halmari (1996), there is a clear preference for subject positions as points of reference for pronominal possessives in general and possessive clitics in particular. Naturally, there are questions regarding the correlation between subject position and salience, primarily, whether the more salient entities are placed in subject position, or the subject positions grant more salience to the entity. Ariel's (2001) view is that the salience influences the syntactic role and degree of accessibility rather than vice versa. However, this is not relevant to my discussion. Once again, the extremely low number of instances in which certain forms were recorded (e.g. Third person plural feminine possessives) do not allow for an accurate assessment in their cases.

While the data regarding the third person pronominal possessives are relatively straightforward and the syntactic position of antecedents seems to be a factor in determining the reduction of the pronoun, the data for the first/second person pronominal possessives are confusing at best. The overwhelming majority of the first/second person pronominals have no antecedents or refer to antecedents in positions other than the subject/direct object position. On the other hand, 100% of the third person

pronominals do have antecedents. The majority of these antecedents are either in the subject or direct object positions.

There seems to be some correlation between the form (pronoun or clitic) of the pronominal possessive and the syntactic role of its antecedent. For example, the third person masculine singular clitic is more likely to refer to an antecedent in subject position than the third person masculine singular pronoun. The same goes for references to direct objects. The third person clitic is less likely to refer to positions other than subjects or objects than the pronoun. Finally, in the absence of an antecedent, only full NPs are used (rather than third person clitics or pronouns). An apparent problem is the form of the first person singular possessive. It seems the pronoun form is more likely to refer to an antecedent in subject position than the clitic form. I will suggest a solution to this apparent problem in §5.

Finally, not only is there a noticeable difference between the distribution of full NPs as opposed to third person pronouns and clitics, but there is also a difference between the feminine and plural pronouns and clitics in comparison to the masculine singular forms. Feminine and plural forms almost always refer to antecedents in subject positions and hardly ever to antecedents in other positions (see also sections §3.1 and §3.2 for discussion regarding the gender and number of the third person forms). I will address this issue in §5.

To conclude, whereas there are some significant correlations between anaphor choice and the syntactic role of the antecedents, there must be additional factors relevant to the selection of the referring expression other than the antecedent's syntactic position. Not only do the data regarding the first person singular possessive pose a problem, but the mere fact that both pronouns and clitics can refer to the same position suggests that additional factors must be involved.

3.6. Phonological and syntactic considerations - The phonetic realization of the possessee - the Adjacency Requirement

The Adjacency Requirement, as defined here, refers to the inclusion of the possessor and possessee in the same phonological phrase (see §2). The lack of linear adjacency due to the insertion of elements between the possessor and possessee (parentheticals, adjectives etc.) clearly affects the phrasing of the two elements. However, it is not merely the linear adjacency which is important. Even when linearly adjacent, the stressing of a word in a phrase could separate it from the rest of the phrase. Similarly, pauses create breaks in the phonological phrasing of elements.

Adjacency (or lack thereof) of the possessor and possessee is pragmatically conditioned. For example, possessives used as predicates are not necessarily adjacent to the possessee (which is seldom mentioned in the same IP, let alone phonological phrase). What is striking to the eye in the following data, however, is not merely the fact that most of the possessive pronoun forms are adjacent to the possessee, but that 100% of the possessive clitics are adjacent to the possessee – no exceptions whatsoever.

The following tables contain the data regarding the third person possessives (excluding the analytic ʃel+NP form, 74.6% (53 of 71) of which were adjacent to the possessee) and the first/second person possessives, showing the correlation between adjacency and the choice of the possessive.

Table 13: Third person possessives and adjacency to possessees

Form	Total	Pronoun		Adjacent to Possessee	Clitic		Adjacent to Possessee
3P-sg-masc	49	ʃelo	27	19 (70.4%)	ʃlo	22	22 (100%)
3P-sg-fem	18	ʃela	9	6 (66.7%)	ʃla	9	9 (100%)
3P-pl-masc	14	ʃelahem	3	3 (100%)	ʃlahem	11	11 (100%)
3P-pl-fem	1	ʃelahen	1	1 (100%)	ʃlahen	0	--

Table 14: First/Second person possessives and adjacency to possessee:

Form	Total	Pronoun		Adjacent to Possessee	Clitic		Adjacent to Possessee
1P-sg	108	ʃeli	28	22 (78.6%)	ʃli	80	80 (100%)
2P-sg-masc	16	ʃelxa	16	10 (62.5%)	ʃxa	0	--
2P-sg-fem	12	ʃelax	11	8 (72.3%)	ʃlax	1	1 (100%)
1P-pl	29	ʃelanu	19	19 (100%)	ʃlanu	10	10 (100%)
2P-pl-masc	1	ʃelaxem	1	1 (100%)	ʃlaxem	0	--
2P-pl-fem	0	ʃelaxen	0	--	ʃlaxen	0	--

A central claim to many phonology-syntax interface theories, Selkirk's (1995) included, is that the formation of the phonological phrase is based on syntactic boundaries (see discussion in §2). Certain phonological processes occurring across word boundaries (such as Liaison in French, tone shift in Bantu languages, stress shift, and cliticization) occur only within the phonological phrase - i.e. they would not occur between two elements in different phonological phrases.

This generalization is also true for my data. The cliticization of the possessive pronoun to its host NP can only occur when the two are in the same phonological phrase. No phrasal breaks are permitted between the two. What becomes apparent here is that although the phonological phrase is necessary for the reduction and cliticization of Hebrew pronominal possessives, it is far from sufficient. Hebrew possessive pronouns cannot be reduced unless they are adjacent to the possessee. However, even if they are adjacent, it does not necessarily follow that they will actually be reduced.

Similarly to the third person pronominal possessives, 100% of the first/second person possessive clitics are adjacent to the possessee. 20% of the possessive pronouns are not adjacent. Once again, we see that Hebrew pronominal possessives cannot be clitics unless they are adjacent to the possessee (modified) NPs. If they are adjacent, however, this does not necessarily imply that they will be clitics.

In (22), possessive pronouns are used to refer to Yoel both by himself and by Nili:

(22) ʃeli – my (full) ; ʃelxa – your-masc.-singular (full)

Yoel: *lo*

No   No.

*ze **seli***

It **mine**   It's **mine**.

Nili: *naxon*

Correct   Correct.

*ze **selxa***

It **yours**   It's **yours**.

An analysis of reduction as obligatory is therefore clearly wrong. Furthermore, an approach which analyses the clitic form as simply freely alternating with the pronoun is just as inadequate. I will show that it is not the adjacency which determines which form is to be used - the possessive clitic, the possessive pronoun or the analytic nominal NP possessive. It is the selection of a specific phonological configuration from those available in a given context which determines this, and this selection is pragmatically determined. Reduction occurs in a phonological environment when certain pragmatic conditions exist. It is these I will discuss in §5.

(22) ʃeli – my (full) ; ʃelxa – your-masc.-singular (full)

Yoel: *lo*

4. Intermediate conclusions

The first thing which is apparent when attempting to determine the distribution of possessive pronouns as opposed to possessive clitics is that the syntactic structure has little (if any) relevance insofar as determining the nature of the phonological constituents in the phonological phrase. Certain pragmatic criteria, such as the humanness, topicality or physical presence of the possessor, or the distance between the possessor and the possessee, predict the form of the possessive chosen more accurately than syntactic phrasing does.

However, there seem to be differences insofar as these criteria are concerned with respect to designated discourse participants (first/second person) and other entities (third person). Third person entities seem to "behave" better than first/second person entities. Generalizations seem to hold more often for third person entities than first/second person entities. The criteria addressed seem to partially explain the distribution of the pronominal possessives as opposed to ʃel+NP possessives as well as the possessive clitics as opposed to the possessive pronouns insofar as third person pronominals are concerned. But none of the generalizations relevant for third person reduced forms seemed to be relevant for the first/second person reduced forms.

Six criteria were examined: The humanness of the entity referred to, its topicality, its physical presence, the distance between the antecedent and its anaphor, the syntactic role of the antecedent and the phonetic realization of the possessee (Adjacency).

The first obvious conclusion is that when selecting a pronominal form – pronoun or clitic - no single criterion is sufficient. The humanness of the entity and its physical presence are relevant when considering third person possessives, but not relevant insofar as the selection of first/second person pronominal possessives is concerned, as first/second persons are always human and always present. The syntactic role of the possessive's antecedent seems to be of some influence with third person pronominal possessives but does not seem to be of any importance when first/second person pronominal possessives are concerned (since the majority did not even have an antecedent). The topicality of the entity referred to seems to have a marginal effect on the selection of the form of third person possessives. It is obvious that pronominal

possessives in general are preferred for topics (as opposed to full NPs), but which possessive (pronoun or clitic) is used in practice remains unclear. However, for first/second person pronominals, even such a marginal effect is not evident.

The only clear cut finding was that clitics required the phonetic realization of a possessee. For clitics to surface, a phrasal configuration such as that suggested by Selkirk (1995) is necessary.[29] The clitic must be of an affixal nature as follows:

Diagram 2 (repeated from Diagram 1):
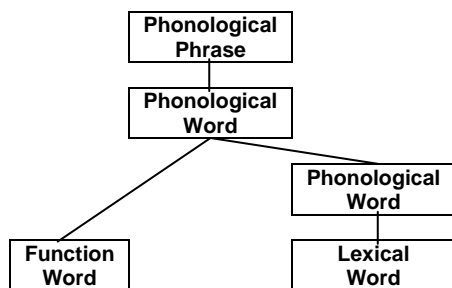
Though many possessees are also present with their respective possessive pronouns, some (first, second and third person possessives) appear without their possessees, as opposed to possessive clitics, 100% of which appear with a possessee.

As mentioned earlier (§3.6), we can now state that a necessary condition for the reduction of a possessive NP is the fulfillment of the Adjacency requirement. However, according to the data, it is not the syntactic bracketing which determines whether a possessive (or any function word) is to be bracketed as a phonological word or as a subconstituent of a prosodic word (as in the diagram above). How then can one determine the bracketing of the possessives, thereby correctly predicting whether it surfaces as a phonological word (possessive pronoun) or affixal clitic (possessive clitic)?

---

[29] See §2.2.

5. Accessibility Theory and Hebrew possessives

In the previous sections, I showed how various factors affected the distribution of the different forms of the possessives in Hebrew – analytic nominal NPs, full pronouns and clitics. However, although the factors may play a role in determining the form selected, it is clear that they cannot explain all the data.

In this section, I will outline Ariel's (1990) Accessibility Theory (AT). Considering the phonology-pragmatics interface, I will show how AT accounts for the data presented in §3. Furthermore, I will show how predictions made by AT together with the phonological theory in §2 are supported by the data in all of the cases. Variations in referring expressions can be explained by AT and the available prosodizations of the expressions.

5.1. Accessibility Theory: General

Ariel (1990) argues that the ease with which a piece of Given information is processed reflects its degree of mental accessibility. For example, immediately preceding utterances are deemed quite accessible to the addressee. The further away an utterance is, the less accessible it is. Physically salient entities are also highly accessible.[30] On the other hand, accessing encyclopaedic knowledge requires a greater processing effort (i.e. this knowledge is less accessible). Representations of linguistic material and physically salient objects are assumed to be in the short-term working memory, as opposed to representations of our encyclopaedic knowledge, which are assumed to be in our long-term memory. Generally speaking, accessibility is a complex notion encompassing several "primitives", such as the humanness of an entity or the distance between referring expressions.

The following example (23) shows that proper names (especially first names), for example, are not specialized for the retrieval of general encyclopaedic knowledge, but rather, for the retrieval of a representation of an entity which has a very low degree of accessibility (see next section):

---

[30] Ariel (2001) claims it is the discoursal, rather than the physical, salience of the entities involved which determines the degree of accessibility assigned to particular mental representations – see §5.1.2.

(23) ʃel+NP – of+NP

Nili: *gur*

        Gur   Gur

        raita   et   ha   nalajim **ʃel joel**

        You-saw Acc. the shoes   **of Yoel**   Have you seen **Yoel's** shoes?

Gur: *lo*

       No   No

Although Yoel is present and his shoes are the newly introduced discourse topic, the linguistic mental representation of Yoel is highly inaccessible at this point in the conversation – hence the use of a proper name rather than a pronoun (such as [ʃelo] 3P-sg-masc).

The central question for AT is not when or how an item is mentioned, but how easy it is to access the relevant representation. The speaker signals to the addressee how easy a retrieval is by using various referring expressions. As an item's availability may fluctuate during discourse, AT would predict the referring expressions to vary accordingly, thereby reflecting the current status of an entity's accessibility.

5.1.1. The criteria associated with the degree of accessibility of markers

How exactly does the speaker mark the level of accessibility? Ariel (1990) presents three principal criteria associated with specific degrees of accessibility. The first, and as Ariel suggests, the most important, is Informativity. Accessibility markers representing a low degree of accessibility incorporate more lexical information than those representing a high degree of accessibility. Accordingly, analytic nominal NPs (in possessive constructions) encode a lower degree of accessibility than possessive pronouns or possessive clitics, since they clearly incorporate more than just the person-number-gender features (which is essentially what pronouns/clitics incorporate). The second criterion, Rigidity, refers to the ability of a referring expression to pick out a unique referent unambiguously. Possessive analytic nominal NPs are more rigid than possessive pronouns which, in turn, are more rigid than possessive clitics. This, of course, depends on the number of competing entities as well. Finally, the Attenuation criterion (phonological size), the most relevant to our discussion, states that all things

being equal, the less accessible an entity referred to by an expression is, the larger the expression is phonologically. This criterion also refers to the difference between stressed and unstressed forms. Shorter and unstressed forms encode a higher degree of accessibility than longer and stressed forms.

Possessive NPs, in general, are essentially NPs and their behaviour should not be different from other NPs (Ariel 2000). Since possessive clitics are unstressed and phonologically smaller than possessive pronouns, they should encode a higher degree of accessibility. I will not compare various clitic forms to one another or various pronoun forms to one another, nor will I claim that since the pronominal possessive has an infinite number of forms (the precise size of each pronoun or clitic varies), one encodes infinitely varying degrees of accessibility. In addition, one has to take into account the rate of speech and the presence of certain adjacent segments when considering segment length or the deletion of a segment.[31] I will follow my definition of clitics as argued for in §2.1 – stressless affixes alternating with a full grammatical item, as opposed to affixes which have no full form with which they alternate.

Ariel (1990, 2001) provides evidence for her claim that the more informative, rigid (unambiguous) and unattenuated a marker is, the lower the accessibility it is specialized for, and vice versa. Therefore, given this, possessive clitics should mark a higher degree of accessibility than possessive pronouns which, in turn, mark a higher degree of accessibility than ʃel+NP possessives as follows:

High accessibility <————————————————————————>**Low Accessibility**
possessive clitics   possessive pronouns   ʃel+NP possessives

5.1.2. Factors affecting accessibility

Accessibility is a complex notion made up of several primitives. Ariel (1990, 1999, 2000, 2001) shows that what accounts for referential choices is a complex evaluation of the degree of accessibility rather than single cues. This might prove to be compatible with the findings in §3, where my data clearly show that no single factor among those presented can account for all the data.

---

[31] For example, the [i] in [ʃeli] may be deleted when the following word is vowel initial – this is not to say that the degree of accessibility of the entity referred to has changed.

When processing an entity, there are certain factors which can raise or lower its accessibility, and subsequently (possibly) determine that different referring expressions be used to refer to it at different points in the discourse. Ariel (1990) suggests several such factors, some of which I discussed in previous sections, all of which she groups together as Salience and Unity (see following two sections). The degree of accessibility is, therefore, a complex notion involving multiple factors.

Whether the raising or lowering of the accessibility of an entity's representation necessarily changes the marker used to refer to it is difficult (if not impossible) to say. For example, an entity's degree of accessibility could be raised without any change in the referring expression used. However, if an entity's level of accessibility is raised, it should never be referred to by a lower accessibility marker. On the other hand, if an entity's level of accessibility is lowered, it should not be referred to by a higher accessibility marker.

5.1.2.1. Salience

Salience pertains to the prominence of the representation as determined by its characteristics. However, this factor is a complex one, consisting of several simpler components (Ariel – 1990, 2001). For example, topics occupy a privileged position in our memory and are, therefore, more accessible than non-topics, all things being equal. Discourse participants (first and second persons) are more accessible than third person entities. Therefore, since topics and discourse participants, for example, are more accessible, one would expect possessors referring to them to be coded by high accessibility markers (pronouns or clitics) rather than by low accessibility markers (full NPs).

The data in §3.2 supports this. In the following example (24), a possessive referring to a non-topic is, as expected, a full NP, while a possessive referring to a topic, as in the following (25) is, as expected, a pronoun:

(24) ʃel+NP – of+NP

Vered: *ma   ze*
            What this   What's this?

           [ze] - -
            This   Is this…?

Nili: *[lo]*
            No   No

           ze sxug ʃe ima   <u>ʃel nir</u> asta
            This sxug that   mother **of Nir**   made   It is sxug that **Nir's** mother made.

(25) ʃla – her (reduced)

Vered: *hajta rut dajan*
            Was **Ruth Dayan$_i$**   **Ruth Dayan$_i$** was there.

           ha ben <u>ʃla$_i$</u>   asa laxem et   ha ʃulxan
            The son **hers$_i$** made for-you Acc. the table   **Her$_i$** son made your table.

However, while an entity's salience might determine whether to use a full NP or not, it still cannot account for the distribution of clitics v. pronouns. Both the possessive pronoun and the possessive clitic are high accessibility markers, suggesting that the distinction between the two is too fine for salience alone to make.

The number of anaphoric references to a certain entity affects its accessibility too. Levy (1982) holds that the notion of the discourse topic is constructed, inter alia, from formal surface devices such as the number of coreferences to a given entity, the density of the coreferential expressions and their position in the clause. Arnold (1997) shows how subsequent references to an entity, or a topic, are more "natural" with less specified (i.e. less informative, less rigid) forms of reference. The more an entity is mentioned, the more likely it is to be the topic. Of course, repeated mentions tend to raise the accessibility of an entity due to repeated accessing of our short term memory.

As we see in the following (26), when repeatedly referring to an entity (in this case, the first person singular), its accessibility rises. This slight rise in accessibility is sufficient to merit the use of a clitic for the second reference, although the first reference was

made by a pronoun, as the degree of accessibility was not yet sufficient for a clitic to be used:

(26) ʃeli – my (full) ; ʃl – my (reduced)

Vered:	*lo hajiti ba xayim __ʃeli__ ba ʃuk*	
	Not I-was in-the life __my__ in-the market	I've never in my life been to the market.
Nili:	*ba karmel?*	
	In-the Carmel?	To the Carmel (market)?
Vered:	*ba xayim __ʃl__ lo hajiti be ʃuk ha karmel*	
	In-the life __my__ not I-was in market the Carmel	I've never been to the Carmel market.

The same is true for the following (27). The repeated use of the third person plural possessive in consecutive IPs causes a rise in the accessibility of the entity referred to thereby requiring the use of the possessive clitic for the second use:

(27) ʃelahem – their-masc. (full) ; ʃleem – their-masc. (reduced)

Nili:	*kʃe anaʃim medabrim*	
	When people speak	when people are speaking
	laasot eze ʃehu nisuj al eh	
	To-do some kind experiment on eh	To do some kind of experiment on
	al anaʃim$_i$	
	On people$_i$	On people$_i$
	ex hem$_i$ medabrim	
	How they$_i$ talk	How they$_i$ talk
	ve al ha safa __ʃelahem$_i$__	
	And on the language __their$_i$__	And on __their$_i$__ language
	ve al orax ha xayim __ʃlahem$_i$__	
	And on way the life __their$_i$__	And __their$_i$__ way of life

However, following this same line of logic (i.e. topics are more accessible and repeated references increase accessibility, however marginally), the following examples (28) and (29) are a problem for theories which rely on topicality of an entity alone:

(28) ʃli – my (reduced) ; ʃeli – my (full)

Nili: *be gadol*

In   big   In general

histamaxti al maʃehu ʃe   raiti paam
*   etsel safta **ʃli**   ba bajit*

I-relied   on something that I-saw once   I relied on something I once saw at **my**
              at   grandmother **my** in-the house   grandmother's.

safta   ha ʃnija

Grandmother the second   My other grandmother.

aval eem

But   eem   But eem

*xiduʃ   **ʃeli***

Innovation **my**   It's **my** innovation.

(29) ʃxa - your-masc. (reduced) ; ʃelxa - your-masc. (full)

Dan: *ha toxnit   ha medinit ʃe   matsia ben eliezer*
*   lo ʃona   me ha   toxnit   **ʃxa***

The programme the political that offer   Ben   Eliezer   The political programme Ben
              not different from the   programme **yours**   Eliezer is suggesting is not
                                                              different from **your** programme.

im ken

If   yes   If so

*ma   ha jixud   **ʃelxa***

What the uniqueness **yours**   What is **your** uniqueness?

Israeli Television (Channel 1), 1.8.2002

Since the first person is the topic in (28) and the first mention of the possessive referring to the topic is [ʃli], we would expect the second reference to be [ʃli] too. Similarly in (29), we would expect the second mention of the possessive in (29) to be [ʃxa] since there is no immediately apparent reason for a drop in accessibility. The position of the possessive (at the end of the speaker's turn) does not affect its form (see (2) and (4) above). How could we solve these apparent contradictions to our expectations?

Ariel (2001) discusses differences between entities which are frame-induced (e.g. waiters in restaurants) and inferable entities which may not necessarily be as salient in a given context, arguing that the former are more accessible than the latter. Indeed, when referring to something one picked up from a grandmother, one would expect this grandmother to be the speaker's. Grandmothers prototypically "belong" to someone.

The possessor (of the grandmother) is very likely to be the speaker - i.e. is predictably the speaker.[32] In (29), the argument structure (comparison) and the situation (an interview regarding someone's future plans) raise the predictability of the possessor in the first mention.

Ariel (2000) discusses new entities which are "relatively easily inferable based on their anchor" (i.e. their possessor), adding that the addressee relies on stereotypical assumptions (that a grandmother is always someone's, people have lives etc.). Indeed, Arnold (1997) suggests it is the predictability of a referent (insofar as reference processing is concerned) which is the underlying cause of salience. Entities which are more predictable in certain positions are more salient. On the other hand, in (28), when referring to an innovation, one would not necessarily expect the innovation to be the speaker's. The same is true for the "uniqueness" in (29). Hence the accessibility of the entity in the first instance, the grandmother in (28) and the plan in (29), is higher (it is more easily predicted) than in the second instance, the innovation in (28) and the uniqueness in (29), which are not as easily predicted as possessed by the continuing referent. This would explain why certain items seem to be followed by clitics more often than others (family members, for example), since they are expected to have a possessor and the potential possessor is highly predictable.[33]

I should note, however, that there is a further difference between (26) and (27) on the one hand, and (28) and (29) on the other hand. The distance between the first and second reference is larger in (28) and (29) – 2 IPs separate them – than in (26) and (27) – where the references are separated by 0 and 1 IP respectively (see §5.1.2.2). As shown in §3.4, this distance proves to be relevant in choosing possessor forms.

The following (30) is of particular interest. The first possessive referring to the wooden cat is a full pronoun, something which is not unusual. The second and fourth references are possessive clitics. This too is to be expected if we take into account that repeated

---

[32] This is so especially in this context. An interesting point regarding native speakers' intuitions is that these show that one often refers to one's own grandmother as [safta ʃeli] 'grandmother my' (or even just [safta] 'grandmother]), while referring to someone else's grandmother as [ha-safta ʃelo] 'the-grandmother his'.

[33] Often the speaker, though possibly a person being talked about.

mentions increase the accessibility of an entity. It is the third reference which is a problem. Why should the accessibility of the entity referred to, the wooden cat, be lower in the third mention than in the second and fourth? I will suggest two possible explanations (which could both be correct simultaneously).

First of all, although the wooden cat is the global topic of the discussion, several IPs separate the second and third referring expressions but only one IP separates the first and second and two separate the third and fourth. The extended lack of reference to the entity under discussion between the second and third references probably results in a decrease in its level of accessibility. Furthermore, the first two mentions are both with respect to the location of the cat. The third refers to its fishing rod – not a prototypical possession of a wooden cat. Once the rod becomes part of the discussion, there is an increase in the accessibility of the cat as the rod's possessor and a subsequent use of a possessive clitic rather than the possessive pronoun:

(30) ʃelo – his (full) ; ʃlo – his (reduced)

Vered: *ma   hi   asta la   xatul$_i$ seli*

What she did   to-the cat$_i$ mine   What did she do to my cat$_i$?

Nili: *gadol*

Great   Great.

hu$_i$ madhim

He$_i$ wonderful   It's$_i$ wonderful.

*tidi   lax   ʃe ani kol kax ohevet
          oto$_i$*

You know to-you that I   so much love   You should only know how much I
         it-Acc.$_i$ love it$_i$.

*lamrot   ʃe ha mikum **selo$_i$** lo tov.*

Although that the location **its**$_i$ not good   Although **its**$_i$ location isn't good.

et   ha   xum

Acc. The brown   The brown.

*ha mikum **ʃlo$_i$** lo [maʃehu]*

The location **its**$_i$ not something   **Its**$_i$ location isn't wonderful.

Vered: *XXXXXXX haja xamud po at jodaat davka*

XXXXXXX was cute   here   you know   XXXXXXX would have been cute
                                                    here, you know?

	[[XXXX]]	
	[[XXXX]]	
Nili:	*[[ken vered]]*	Yes, Vered?
	[[yes vered]]?	
Vered:	*roca lenasot ulay*	
	Want to-try maybe	Would you like to try maybe?
Nili:	*ani azbir lax ma ha beaya*	
	I will-explain to-you what the problem	I'll explain the problem to you.
	*[ʃe ha xaka **ʃelo**ᵢ]*	
	[that the rod **its**ᵢ]	**Its**ᵢ rod
Vered:	*[XXXXXXXX]*	
	[XXXXXXXX]	
Nili:	*lo*	
	No	No
	*ha xaka **ʃlo**ᵢ*	
	The rod **its**ᵢ	**Its**ᵢ rod
	hu haja kvar al ha madaf ʃam	
	He was already on the shelf there	It was already on the shelf there

Recalling the analysis of animacy in §3.1, Comrie (1989) suggests that salience is not a primitive, but rather a complex notion resulting from the interaction among several factors, including animacy. Ariel (2000) argues that humans are normally relatively more accessible than inanimate objects. The propensity of animates to be referred to by pronouns is due to their higher accessibility. According to Dahl and Fraurud's (1996) analysis of animacy, the greater the distance between an entity and its pronominal anaphoric expression, the more likely it is to be human. AT would predict this fact – the greater the distance, the lower the degree of accessibility. Since animates are more accessible than inanimates, it would follow that they would be less affected by the distance and more accessible than inanimates even when the distance between them and their anaphors increases (see Ariel 2001).

There is no doubt that the humanness of an entity affects its salience (see discussion in §3.1) and is, therefore, a factor in determining an entity's degree of accessibility. On the other hand, the humanness of an entity is constant while the accessibility of an entity

may fluctuate. Therefore, it follows that if anything determines the alternation insofar as the forms of the possessives are concerned, it cannot be a constant factor, but rather a more complex fluctuating factor, such as salience.

An additional factor affecting the salience of an entity's representation is competition – i.e. how many other entities are competing for the same role? In order to select the intended entity, a lower accessibility marker, i.e. more informative, more rigid and less ambiguous, is necessary. As Ariel (1990, 2001) shows, when two entities compete for a certain role, a lower accessibility marker is necessary as opposed to when only a single entity is probable for a certain role in the same context. Arnold's (1997) experiments showed that entities were more salient when not competing with a discourse (or sentential) topic.

In the following (31), the first possessive is a clitic rather than a possessive pronoun since there are no (highly probable) candidates for the role of possessor other than [hem] 'they' in the given context:

(31) ʃleem – their-masc. (reduced)

Vered: *at   lo mevina   ʃe ze tarbut magila   me*
            ha bxina hazot

You not understand that it culture disgusting from   Don't you understand that it's a
        the aspect this   disgusting culture from this aspect?

at   tsrixa lirot   ex hem mitjaxsim la
            *naʃim **ʃleem***

You must   to-see how they   treat   to-the   You should see how they treat **their**
        women **their**   women.

*kol ha naʃim **ʃleem** ba   χχ*
All the women **their**   on-the XX   All **their** women on the XX

As opposed to (31), in (32), there are at least two equally possible possessors for the first mention of [bayit] 'house' – [ʃelanu] and [ʃelaxem]. Neither is more likely and therefore, a lower accessibility marker is necessary (pronoun rather than clitic). The possessor in the second mention of [bayit] is already unambiguous, established by the previous conversation, and therefore a clitic is employed. The fact that the referring expression is not identical (second person possessive in the first mention and first

person possessive in the second mention - due to change of speaker) has no effect on the entity's accessibility:

(32) ʃelaxem – your-plural-masc. (full) ; ʃlanu – our (reduced)

Vered:	*bar yayin po*		
	Bar wine here		A wine bar (near) here.
	*lejad ha bayit **ʃelaxem***		
	Near the house **your**		Near **your** house
Nili:	*lo naxon*		
	Not true		You're kidding.
	*efo lejad ha bajit **ʃlanu**?*		
	Where near the house **our**?		Where near **our** house?

Checking the salience, a complex notion, of an entity in a given context promises to predict the form of the referring expression better than any single primitive criterion would. The more salient entities are referred to with clitics, while the less salient entities are referred to with pronominal possessives or even nominal possessives. However, other factors are relevant too, as I will show in the following section.

5.1.2.2. Unity

Taking the above into consideration, the following example presents yet a further problem. The possessor referred to (the first person) in both cases is the topic in example (33). Both possessees are identical in their relationship to the possessor (everyone has a mother and a father and in the given context, and I would not want to suggest that the mother is a more accessible entity than the father). The possessive in the second instance ([aba ʃeli]) is a pronoun, while in the first it is a clitic. If the accessibility of the possessor in the first mention was high enough to merit the use of a clitic, surely the accessibility should be at least as high in the second mention. It certainly should not be lower, subsequently requiring the use of a pronoun:

(33) ʃli – my (reduced) ; ʃeli – my (full) ; Sx – your-fem. (reduced)

Nili:	*at ovedet alaj*	
	You kidding on-me	You're kidding me
	bat kama hajit?	
	How old you-were?	How old were you?

Vered:	*esrim*	
	Twenty	Twenty.
Nili:	*ve*	
	And	And
	ha horim ʃx jadu?	
	The parents **your** knew?	Did **your** parents know?
Vered:	*ima ʃli jada*	
	Mother **my** knew	**My** mother knew
	aval aba ʃeli lo jada	
	But father **my** not knew	But **my** father didn't know.

The apparent problem can be solved when considering the degree of cohesion between the antecedent and the anaphor. Ariel (2001) suggests that the unity between the two is, inter alia, affected by the distance between them. The greater the distance, the lower the degree of cohesion or unity and the less accessible it is. By distance, Ariel (2001) does not refer to the distance in words, but rather episode boundaries. I suggest measuring distance by reference to intonation units. By unity, Ariel refers to the antecedent and anaphoric expression being in the same frame/world/point of view/segment – and I am suggesting intonation units. New clauses and intonation units may produce looser connections between an antecedent and its anaphor, thereby lowering the degree of accessibility.

Li and Thompson (1979) discuss the conjoinability of two clauses – the extent to which a clause constitutes a single unit with the preceding clause. They suggest that the degree of conjoinability between two clauses decreases considerably when the second clause is marked with contrastive morphemes such as 'but' or 'however'. These elements signal the beginning of a new sentence rather than a connected clause. In Chinese, they claim, whether a pronoun or a zero-subject appear in a given clause depends on the degree of conjoinability – the lower the degree of conjoinability between two clauses is, the higher the likelihood of a pronoun (rather than a zero-subject) occurring in the second clause.

In the above mentioned (33), the conjunction [aval] 'but' breaks the IP creating two IPs. This causes the degree of conjoinability to drop, thereby lowering the accessibility

of the possessor marginally. This marginal difference in accessibility proves to be sufficient to merit the use of a lower accessibility marker. The use, for example, of [ve] 'and' in a similar situation does not affect the unity as two IPs connected by 'and' would still be considered to be within the same frame. Therefore, while we have a lowering of the entity's accessibility following 'but', the following example (34) shows that we probably do not have such a lowering following 'and':

(34) ʃelahem – their-masc. (full) ; ʃleem – their-masc. (reduced)

Nili:	*kʃe anaʃim medabrim*	
	When people speak	when people are speaking
	laasot eze ʃehu nisuj al eh	
	To-do some kind experiment on eh	To do some kind of experiment on
	al anaʃim$_i$	
	On people$_i$	On people$_i$
	ex hem$_i$ medabrim	
	How they$_i$ talk	How they$_i$ talk
	ve al ha safa ʃelahem$_i$	
	And on the language **their**$_i$	And on **their**$_i$ language
	*ve al orax ha xayim **ʃlahem$_i$***	
	And on way the life **their$_i$**	And **their$_i$** way of life

Example (35) below serves as a counterexample to the claim that it is not the 'but' which reduces the degree of accessibility, but rather the beginning of a new IP.

(35) ʃelo – his (full) ; ʃlo – his (reduced)

Vered:	*ma hi asta la xatul$_i$ seli*	
	What she did to-the cat$_i$ mine	What did she do to my cat$_i$?
Nili:	*gadol*	
	Great	Great.
	hu$_i$ madhim	
	He$_i$ wonderful	It's$_i$ wonderful.
	tidi lax ʃe ani kol kax ohevet oto$_i$	
	You know to-you that I so much love it-Acc.$_i$	You should only know how much I love it$_i$.
	*lamrot ʃe ha mikum **selo$_i$** lo tov.*	

Although that the location **its**_i not good   Although **its**_i location isn't good.

et   ha   xum
Acc. The brown   The brown.

ha mikum ʃlo_i lo [maʃehu]
The location **its**_i not something   **Its**_i location isn't wonderful.

Vered: *XXXXXXX haja xamud po at jodaat davka*
XXXXXXX was cute   here   you know   XXXXXXX would have been cute here, you know?

[[XXXX]]
[[XXXX]]

Nili: *[[ken vered]]*   Yes, Vered?
[[yes vered]]?

Vered: *roca lenasot ulay*
Want to-try   maybe   Would you like to try maybe?

Nili: *ani azbir   lax   ma ha beaya*
I   will-explain to-you what the problem   I'll explain the problem to you.

[ʃe ha xaka ʃelo_i]
[that the rod **its**_i]   **Its**_i rod

Vered: *[XXXXXXXXX]*
[XXXXXXXXX]

Nili: *lo*
No   No

ha xaka ʃlo_i
The rod **its**_i   **Its**_i rod

hu haja kvar   al ha madaf ʃam
He was already on the shelf   there   It was already on the shelf there

Two IPs separate the first mention of the cat's fishing rod ([ha xaka ʃelo] 'its (pronoun) rod' and its second mention ([ha xaka ʃlo] 'its (clitic) rod'. There is even a change of speaker. However, the degree of cohesion has not dropped. On the contrary – it has risen, requiring the use of a higher accessibility marker in the second mention than in the first.

Further research regarding the affect of different connectives (or other expressions) on accessibility is called for. I believe that merely creating two IPs does not necessarily

imply that there has been a drop in accessibility. The type of break between the IPs is relevant (conjunction, pause, new speaker, etc.)

5.2. Accessibility and the phonological phrase

In §2, I described the phonological theory which partially explained the distribution of possessive pronouns v. the possessive clitics. Possessive clitics are morphosyntactically not phonological words but rather prosodized within the same phonological word as the possessee (which, hierarchically speaking, dominates the clitic). On the other hand, the possessive pronouns' surface prosodization is different. They are independent phonological words.

In §5, I demonstrated how changing the accessibility of an entity's representation could affect the referring expression (pronoun or clitic) used. It was shown that when comparing two entities (or two mentions of a specific entity), all things being equal, one would probably be able to determine which of the two is more accessible, thereby predicting the choice of the accessibility marker.[34]

How do these two theories, both predicting the form of the pronominal possessive – a clitic or a pronoun – interact?

The phonological theory requires adjacency in order to reduce. Adjacency is a necessary, but not sufficient, condition for reduction. Regardless of what the degree of accessibility of an entity is, if the referring pronoun does not have an adjacent phonological word (the possessee) with which it can be prosodized, it cannot be reduced. It is necessarily prosodized as an independent phonological word – i.e. a full form rather than a clitic form.

On the other hand, if the adjacency requirement is fulfilled, if the possessive pronominal can be prosodized with the preceding possessee within the same phonological word, it still does not follow that this will indeed be the case. It merely allows for such a surface

---

[34] However, if there are several distinguishing factors, this calculation becomes more complex. If one of them is definitely more accessible, this still does not necessarily merit the use of a higher accessibility marker. It follows, however, that a lower marker would not be used.

prosodization. The clitic may be used. It is, however, pragmatic considerations which select the form. It is my thesis that accessibility determines whether the reduction actually takes place.

In addition to the examples in §3.6 and §2.2, the following example is of particular interest:

(36) ʃelo – his (full)

Vered: *hi   tarma axʃav et kol mixtavej ha ahava*
                ʃe huᵢ ʃalax la

She donated now Acc. all letters the love that he$_i$ sent to-her	She just donated all the love letters he sent her

Nili: *moʃe?*

Moshe?	Moshe?

        mmmm

Mmmm	Mmmm

Vered: *xxxxxx*

XXXXXXX	XXXXXXX

        azav ota

Left her-Acc.	(He) left her.

        *ex   karu la   iʃa ha ʃnija   **ʃelo**$_i$*

How called to-the wife the second **his**$_i$	What was **his** second wife's name?

In (36), the entity ('he'=Moshe) is highly accessible according to the criteria presented in §5. This is evident from the previous references to Moshe. The first reference by Vered is a pronoun ([hu]). His (Moshe's) degree of accessibility is so high, that in the second reference, a gap suffices, even though [azav ota] 'left her' is formally grammatically incorrect. Nevertheless, the third reference, in the next IP, the possessive, is a pronoun rather than a clitic. The head of the possessive phrase, [iʃa] 'wife', is not adjacent to the possessive pronominal, [ʃelo] 3P-sg-masc, because of the intervening

phonological word (the adjective [ʃnija] 'second') and therefore, despite the high degree of accessibility, reduction cannot occur.[35]

I am proposing that the mechanism producing the surface form of the possessive (or any form which has full and cliticized alternants) is roughly as follows:

1. The accessibility of the entity to be referred to is pragmatically determined. The higher the accessibility, the more likely a clitic is to be used. The lower the accessibility, the more likely a pronoun is to be used.
2. If the accessibility is high enough to merit the use of a pronominal, but not high enough to merit the use of a clitic, then a full pronoun will be used.
3. The pronoun will be prosodized as a phonological word.
4. If the accessibility is high enough to merit the use of a clitic, then the available phonological phrasings need to be checked – if the possessive can be prosodized with appropriate host NPs, then it can be prosodized as an affixal clitic and surface as a clitic. Otherwise, regardless of the degree of accessibility, it will surface as a full pronoun, simply because the phonological phrasing does not allow otherwise.

Diagram 3:
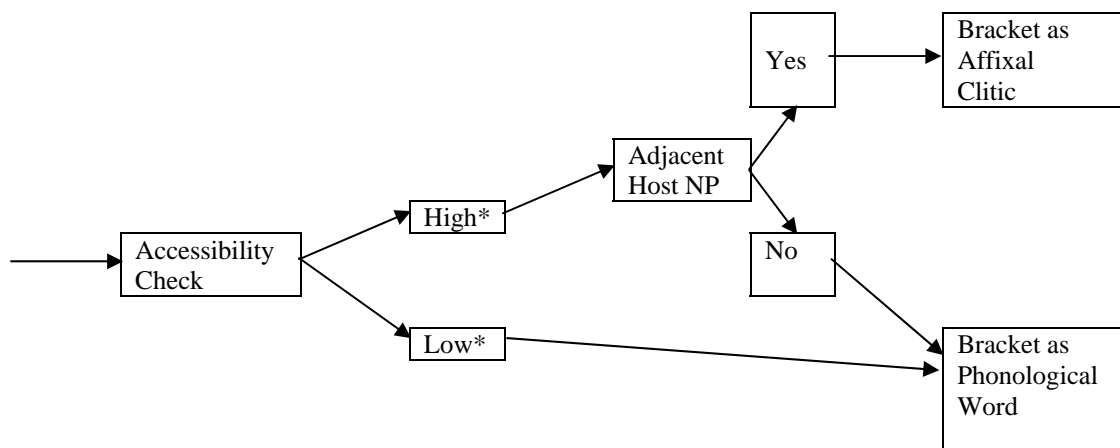
* High=High enough to justify clitic / Low=Too low to justify clitic

---

[35] This interestingly was the only example in the corpus in which the addressee questioned the speaker with respect to the referent, suggesting that the speaker incorrectly assessed the referent's degree of accessibility to the addressee. Although the speaker may indeed make such incorrect assumptions regarding the degree of a referent's accessibility, this is evidently a rare case (for adults).

The prosodization of the clitic with the linearly preceding phonological word depends on several factors. First and foremost, there cannot be a break between the two (for example, due to emphatic stresses, pauses, IP breaks.). Secondly, the possessive can only phrase with the preceding possessee. If the possessee is not immediately linearly adjacent (for example, an adjective intervenes, as in (36)), then the possessive pronoun must be prosodized as an independent phonological word. This is to be expected. Recall the definition of a clitic (§0 and §2). The clitic is pronounced as part of an adjacent word and it is obligatorily positioned in relation to other constituents.[36]

In conclusion, it appears that the prosodization of the pronominal possessive does not necessarily refer to the syntactic structure. Prosodizing the possessor and the possessee in the same phonological word (i.e. necessary if the latter is a clitic) is dependent on pragmatic rather than syntactic criteria. It is not clear what kind of role syntactic bracketing plays in this instance.

5.3. Predicting the form of the possessives – calculating Accessiblity

How predictable is the accessibility of a given entity? Since accessibility is a complex notion, it stands to reason that in order to evaluate an entity's status and to determine which referring expression to use, one must simultaneously assess several factors, all of which affect its accessibility. Following Ariel (1999), I will not claim that in practice, the speaker actually assesses each and every component of an entity's accessibility. Furthermore, it is currently impossible to determine exactly how the assessment takes place. However, by incorporating the various criteria discussed above, all of which have been independently shown to affect accessibility, into a more complex system of calculation, I believe it is possible to determine, approximately at least, an entity's level of accessibility in relation to that of other entities.

I will next argue that the more complex notion of accessibility, as shown by Ariel (1999) better predicts the referring expression chosen – NP possessive, pronoun or clitic. This is demonstrated by the following data. Ariel (1999) employs a system in which several criteria are scored and the sum of the scores is shown to predict the

---

[36] For example, the negative 'not' in English can only attach itself as the clitic 'n't' to an adjacent auxiliary. Romance object pronominal clitics are prosodized with adjacent verbs.

referring expression's choice better than any single criterion. Adopting the principle while modifying the exact system employed by Ariel, I will demonstrate how the form of Hebrew possessives can be similarly predicted.

I will take six accessibility factors into account in my calculations, all of which were discussed individually in previous sections: the humanness of the entity referred to by the possessive (humans are more accessible than non-humans), the syntactic role of the possessive's antecedent (e.g. subjects are more accessible than indirect objects), the distance between the possessive and the previous mention of the entity referred to (the smaller the distance, the higher the degree of accessibility), the topicality of the possessor (topics are more accessible than non-topics), the possessor's physical presence (all things being equal, physically present objects are more accessible) and the entity's participation in the discourse (discourse participants are more accessible). The selection of these factors is not random. Rather, they have all been shown independently to affect accessibility to some degree. If more factors affecting accessibility are taken into account, I have no doubt the calculations will become more accurate. However, I will show that even six factors, some with only a marginal effect on the entity's accessibility, predict the form of the referring expression to a surprisingly accurate degree, despite an inaccurate and crude system of scoring (see §5.3.1.). Furthermore, I will show that in the few cases in which the predictions do not follow the facts, other factors known to affect accessibility can be shown to play an important role.

5.3.1. Weighting the criteria

The entities were each given a score according to the criteria mentioned. The scores were added up, resulting in an overall score. The higher the score, the more accessible the entity is deemed to be. The system, admittedly a rough and crude one, scored the entities as follows.

Insofar as the humanness criterion is concerned, human entities were scored 1, non-human entities were scored 0. Regarding the syntactic role of the antecedent, subjects were scored 2, direct objects 1, and other syntactic roles (or a lack of a linguistic antecedent) received 0. Distances of zero to one IPs scored 2, two IPs scored 1, more than two IPs scored 0. Topics scored 1, while non-topics scored 0. Physically present

entities scored 1. Absent entities scored 0. Finally, designated discourse participants scored 1 while other entities scored 0. Theoretically, an entity could score between 0 and 8 points.

5.3.2. Calculating accessibility

The following table presents the distribution of the various referring expressions based on their relative scores. While there is definitely not a one-to-one correlation between certain scores and the referring expression chosen, several things can be readily deduced from the data as presented.

Table 15: Referring expression choice according to accessibility score:[37]

Score	Total	ʃel+NP (%)		Pronoun (%)		Clitic (%)	
0	26	**26**	**(100%)**	0		0	
1	37	**35**	**(94.6%)**	1	(2.7%)	1	(2.7%)
2	12	**8**	**(66.7%)**	3	(25%)	1	(8.3%)
3	89	1	(1.1%)	**53**	**(59.6%)**	35	(39.3%)
4	24	0		11	(45.8%)	**13**	**(54.2%)**
5	43	0		21	(48.8%)	**22**	**(51.2%)**
6	56	1	(1.8%)	18	(32.1%)	**37**	**(66.1%)**
7	32	0		8	(25%)	**24**	**(75%)**
	319				**(100%)**		**(100%)**

First of all, there is an extremely high degree of correlation at the "edges". Entities scoring 0, i.e. having an extremely low degree of accessibility, were invariably referred to with ʃel+NP constructions (low accessibility markers). Even entities scoring 1 were almost always referred to with ʃel+NP. With only a few exceptions, the higher the score, the less likely a referring expression is to have a ʃel+NP form. There was only one high scoring entity (6) which was referred to with ʃel+NP as the following example shows:

---

[37] No entities in the study scored 8 points out of the possible 8.

(37) ʃel+NP – of+NP

　　　　　wow

Vered:

　　　　　Wow　　　　　　　　Wow

　　　　　salat

　　　　　Salad　　　　　　　Salad

　　　　　ejze   kef ʃel salat

　　　　　Which fun **of   salad**　　　What a great salad

This example, however, is not problematic. The ʃel+NP construction here is not a

possessive construction at all, but rather a collocation ([*ejze kef ʃel X*] 'what a great

X') used to express the appreciation of some X.[38]

The higher the score, the more likely a pronoun or clitic is to be used. Pronouns are

preferred to clitics for scores of up to 3. Entities with a score higher than 3 are more

likely to be referred to with clitics.

At the other edge of the scale, entities with a score of 7, show an overwhelming

preference for possessive clitics. However, unlike the 0-scoring entities, the entities

scoring 6 and 7 are not invariably clitics. The explanation for the use of pronouns as

well as clitics for such entities is at least threefold. First of all, these are not the highest

scoring entities. Entities scoring 8 are possible, though not present in the corpus. It is

possible that such entities were simply not present in the corpus. However, this apparent

discrepancy may be attributed to the fact that highly accessible entities often have no

phonetic realization (null subjects, gaps etc.). Since only pronouns, clitics and full NPs

were counted, such entities were not factored into the analyses.[39] Furthermore, there are

other factors which could be incorporated into the calculation which would probably

give a much more accurate picture. An example of such a case is the following:

---

[38] This form appeared only once in the corpus.

[39] In Ariel's (1999) study of relative clauses and accessibility, for example, the entities scoring the
maximum possible score were invariably referred to by gaps rather than by relative pronouns.

(38) ʃx – your-fem. (reduced) ; ʃli – my (reduced) ; ʃeli – my (full) ;

Nili:	*at ovedet alaj*	
	You kidding on-me	You're kidding me
	bat kama hajit?	
	How old you-were?	How old were you?
Vered:	*esrim*	
	Twenty	Twenty.
Nili:	*ve*	
	And	And
	ha horim ʃx jadu?	
	The parents **your** knew?	Did **your** parents know?
Vered:	*ima ʃli jada*	
	Mother **my** knew	**My** mother knew
	aval aba ʃeli lo jada	
	But father **my** not knew	But **my** father didn't know.

Despite a score of 6, a pronoun is used in [*aba ʃeli*] 'my father' because [aval] 'but'

affects the conjoinability and subsequently the accessibility of the entity ([ʃeli] 1P-sg).[40]

Finally, in 25% (8 of out 32) of the cases in which entities scored 7, the referring

expressions were pronouns rather than clitics. Five of the entities were not syntactically

adjacent to the possessee. Two were syntactically adjacent to the possessees but the

latter was stressed.[41] Although the pragmatic conditions are appropriate for the use of a

clitic rather than a pronoun, the phonological conditions, the possessive's lack of ability

to form a single phonological word with the possessee, do not allow the use of a clitic.

Therefore, only a pronoun is possible. In only one case of the eight, was a pronoun used

where a clitic could reasonably have been used as well.

As shown in §3, no single criterion would predict the form of the possessive accurately.

However, the analysis I have provided clearly illustrates how combining the various

---

[40] Conjoinability was not factored into my calculations. See discussion in §5.1.2.2.
[41] See §3.6 for extensive discussion of adjacency.

factors estimating the level of accessibility predicts the referring expression's form quite accurately.

6. Conclusions

Phonological phrasing is pragmatically, rather than syntactically, determined. The phonological bracketing of possessive pronominal forms, and indeed, of all pronominal forms, cannot be accounted for by the phonology-syntax interface.

Since the form of the pronominal referential expressions, pronouns and clitics, seems to have a complex pattern of alternation, a complex notion such as accessibility is necessary to account for the patterns of the clitic-pronoun alternations observed. Simple, non-fluctuating or absolute notions such as animacy, physical presence or topicality cannot fully account for the distributional patterns observed. The use of the full or reduced pronominal possessives (pronouns or clitics) – which indicates the type of bracketing involved – is constrained by pragmatic factors, in particular, degree of accessibility. While an accessibility check determines which referring expression is best to use in a given context, the phonology has to decide which configurations are available.

Accessibility, although a complex notion, is calculable. As I have shown, the relative degree of accessibility of entities at any given point can be evaluated with surprising accuracy using the crudest of tools. This suggests that more complex processes, such as those occurring in our brains, can evaluate an entities degree of accessibility to an even higher degree of accuracy.

However, the theory regarding the prosodic structure of clitics is not confined to referential elements, such as pronouns. Other linguistic elements, such as auxiliaries, negative particles or adverbials, also have both full and reduced forms. In such cases, the reduction once again does not seem to be syntactically conditioned. How can one account for the distribution of such non-referential elements if the syntactic evidence is inconclusive? Accessibility Theory, dealing primarily with referential expressions, cannot determine these alternations. Other pragmatic notions, such as the recoverability of an element, may play a role here. Exactly how the distribution of these elements is determined is a subject for further research.

Appendix I: The transcription

The transcription of the data roughly follows the system presented in Du Bois et al (1992). A somewhat broad transcription was used. The features transcribed were principally those deemed by me to be relevant to the issues dealt with.

All examples are presented in three parts:

The first line of each intonation unit or intonational phrase (IP) is in italics. The second line of each IP is a literal word-for-word translation of the first line, to the right of which a translation appears.

The system used is as follows:

1. New lines represent new IPs.

2. -- : A double hyphen indicates that the speaker breaks off the IP before completing its projected contour.

3. - : A single hyphen indicates where the speaker has truncated a word, leaving the end of the (projected) word unuttered.

4. […] : Square brackets are used to indicate the beginning (left bracket) and the ending (right bracket) of overlap between the utterances of two speakers. If more than one instance of overlapping occurs in a given section, then double square brackets [[…]] may be employed to distinguish between the overlapping utterances.

5. ((…)) : A pair of double parentheses encloses any comment I have chosen to make. The comment is written in capital letters.

6. X : The capital letter X is used to indicate speech which is not audible enough to allow a reasonable guess at what was said. One X is used for each syllable of indecipherable speech.

Appendix II: Intonation units

In the prosodic hierarchy, it is generally thought that phonological words are dominated by phonological phrases, which are, in turn, dominated by intonational phrases (IPs). Phonological words cannot span two phonological phrases and phonological phrases cannot span two IPs.

How exactly are IPs formed? The status of the IP has been seen by some to be directly related to syntactic structure, an approach I will not adopt. Selkirk (1986) assumes a more semantic or even pragmatic role for intonational phrasing, which is roughly the approach adopted.

Beck (1999) states that while IPs are sensitive to syntactic structure, there are other factors affecting them, such as intonational focus or rate of speech. For example, stressed lexemes (focussed) may be phrased on their own. Extremely slow speech may result in phrasing each syntactic word (or even parts of a word) on its own. Beck (1999) observes how at the beginning of discourse episodes, an IP boundary is inserted between the deictic and its NP, indicating that the deictic element is treated here as a phonological word.[42]

In this paper, I have followed Du Bois et al's (1992) analysis of intonation units or intonational phrase. Roughly speaking, an IP is "a stretch of speech occurring under a single unified intonation contour". Du Bois et al suggest five major prosodic cues which signal the boundaries:

1. <u>coherent contour</u>: a unified intonation contour

2. <u>reset</u>: a resetting of the baseline pitch level at the beginning of a unit

3. <u>pause</u>: a pause at the beginning of the unit (i.e. between units)

4. <u>anacrusis</u>: a sequence of accelerated syllables at the beginning of the unit

5. <u>lengthening</u>: a prosodic lengthening of the syllable(s) at the end of a unit

Syntactic structures were not considered when identifying the intonation units. Sentences or even words may be split between units (see, for example, the above mentioned (2) which shows this).

---

[42] Following the discussion in §5.2, this is to be expected, as episode initial references probably require lower accessibility markers and full deictics (phrased on their own) mark a lower degree of accessibility than reduced deictics (phrased with an adjacent word).

References

Ariel, Mira. 1990. *Accessing NP Antecedents*. London: Routledge.

Ariel, Mira. 1999. Cognitive Universals and Linguistic Conventions: The Case of
Resumptive Pronouns. *Studies in Language* 23:2. 217-269

Ariel, Mira. (in press). Accessibility Marking: Discourse Functions, Discourse Profiles
and Processing Cues.

Ariel, Mira. 2001. Accessibility Theory: An overview. In Ted Sanders, Joost
Schliperoord and Wilbert Spooren eds. *Text representation.* John Benjamins
(Human cognitive processing series). 29-87

Arnold, Jennifer. 1997. What is Salience?: The Role of Topic and Focus in Processing
Reference. Unpublished Ms. Stanford University

Beck, David. 1999. Words and Prosodic Phrasing in Lushootseed Narrative. *Studies on
the Phonological Word.* In T. Alan Hall and Ursula Kleinhenz eds. Amsterdam:
Benjamins. 23-46

Clark, Herbert H., Robert Schreuder and Shirley Buttrick. 1983. Common ground and
the understanding of demonstrative reference. *Journal of Verbal Learning and
Linguistic Behavior* 22: 245-258

Comrie, Bernard. 1989. *Language Universals and Linguistic Typology.* Second Edition.
Oxford: Blackwell

Dahl, Osten and Kari Fraurud. 1996. Animacy in Grammar and Discourse. *Reference
and Referent Accessibility*. In Fretheim and Gundel eds. 47-64

DuBois, John, Susanna Cumming, Stephan Schuetze-Coburn, and Danae Paolino, eds.
1992. *Discourse Transcription*. Santa Barbara Papers in Linguistics Volume 4.
Santa Barbara: University of California.

Haiman, John. 1991. From V/2 to subject clitics: Evidence from Northern Italian. In
Traugott and Heine eds. vol. 2. 135-157

Halmari, Helena. 1996. On Accessibility and Coreference. *Reference and Referent
Accessibility*. In Fretheim and Gundel eds. 155-178

Inkelas, Sharon and Draga Zec. 1995. Syntax-phonology Interface. *The Handbook of
Phonological Theory*. In Goldsmith ed. 535-549

Keenan, Edward L. and Bernard Comrie. 1977. Noun Phrase Accessibility and
Universal Grammar. *Linguistic Inquiry* 8. 63-99

Langacker, Ronald W. 1991. *Foundations of Cognitive Grammar: Descriptive Application*. Volume II. Stanford: Stanford University Press

Levy, Elena. 1982. Toward an objective definition of "Discourse Topic". In K. Tuite, R. Schneider, and R. Chametzky eds. *Papers from the Eighteenth Regional Meeting of the Chicago Linguistic Society*, Chicago: CLS. 295-304

Li, Charles and Sandra A. Thompson. 1979. Third-person pronouns and zero-anaphora in Chinese discourse. In T. Givon ed. *Syntax and Semantics: Discourse and Syntax.* Vol. 12. 311-335

Odden, David. 1987. Kimatuumbi phrasal phonology. *Phonology Yearbook* 4. 13-36

Peperkamp, Sharon. 1996. On the Prosodic Representation of Clitics. In U. Kleinhenz ed. *Interfaces in Phonology.* Berlin: Akademie Verlag. 104-128

Selkirk, Elisabeth. 1986. On derived domains in sentence phonology. *Phonology Yearbook* 3. 371-405

Selkirk, Elisabeth. 1995. The Prosodic Structure of Function Words. *Optimality Theory*. Beckman, Urbanczyk and Walsh eds. Amherst: University of Massachussetts Occasional Papers, GLSA. 439-469

Zwicky, Arnold. 1970. Auxiliary Reduction in English. *Linguistic Inquiry* 1. 323-336