

SECTION 1

Accessibility in text and text processing

Both in modeling discourse structure and in processing studies, accessing referents and the linguistic coding of accessibility are central issues. The three chapters in this section show that these phenomena need to be studied from a linguistic and a psycholinguistic angle. In **Chapter 2**, **Ariel** discusses the linguistic means of reference to discourse entities. Her central claim, based, among others, on corpus analysis, is that language users do not arbitrarily switch between different referential forms, such as pronouns and full NPs, but that they show a systematic pattern. As in her earlier work, Ariel argues that the form of referential expressions can be explained by means of accessibility theory: the less accessible a referent is, the more elaborate the referential marker used by the language user. She gives an overview of her own Accessibility Theory, re-explaining aspects that have sometimes been misunderstood, and elaborating it with new findings. Then, her theory is compared to other accounts of reference. She explicitly addresses the issue of the cognitive motivation behind the theory, and discusses the relationship with psycholinguistic work on anaphoric reference.

In **Chapter 3**, **Gaddy, Van den Broek and Sung** use a typically psychological framework to model allocation of attention in what they call the *Landscape Model of Reading*. The model addresses the issue how various text characteristics (linguistic, discourse-structural) guide the reader's attention during reading and how they affect the mental representations readers construct of the discourse. The referential forms studied by Ariel (see Chapter 2) are one of these textual devices determining the workings of the model. The authors claim that theirs is an adequate model of the on-line reading process. The chapter once again underlines the importance of the notion of 'activation' as an explanatory concept in understanding the reading process and its result: a coherent mental representation of the information expressed in the text.

Activation is also a key concept in **Chapter 4**, by **Giora and Balaban**. This chapter deals with accessing literal and non-literal (or metaphorical) lexical meaning in text production, such as *the boys' fight in the schoolyard* (literal) vs. *the union's fight against the government* (non-literal). On the basis of experi-

mental research, the authors defend a modified version of the view that lexical processes are autonomous, namely that salient meanings of a word (i.e., those that are coded into a language) are always activated, regardless of whether the activated meaning is contextually appropriate. Empirical evidence for the so-called 'graded saliency hypothesis' comes from a rating experiment in which participants were asked to indicate how they had understood a particular word. It is shown that even if the surrounding discourse strongly evoked a 'figurative' meaning, participants activated the coded meaning of the target word as well. The chapter relates to Gaddy et al.'s chapter in its dynamic conception of linguistic meaning. Furthermore it relates to Schilperoord's claim (Chapter 12) that in text production the planning takes place in a modular way.

CHAPTER 2

Accessibility theory: an overview

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Accessibility theory (Ariel 1985a, 1990 and onwards) describes how human language, specifically, the referential system, is responsive to facts about human memory, where memory nodes are not equally activated at any given time. Some are highly activated, others are only mildly activated, and in between, the range of activation is infinite in principle. Most memory nodes are of course not at all activated. Yet, speakers may wish to refer to Given (i.e., familiar) pieces of information, regardless of their current degree of activation for the addressees. Accessibility theory offers a procedural analysis of referring expressions, as marking varying degrees of mental accessibility. The basic idea is that referring expressions instruct the addressee to retrieve a certain piece of Given information from his memory by indicating to him how accessible this piece of information is to him at the current stage of the discourse.¹ To be sure, most referring expressions simultaneously also contain some conceptual content which contributes to the retrieval process. For example, *she* simultaneously means 'highly accessible', and 'female and singular', and *the friend* implies that the entity is 'of a relatively low degree of accessibility' because it is a definite description, and also that it is a 'close acquaintance', etc. But some linguistic entities (e.g., zeroes) are purely procedural, namely lacking any content, only marking a specific interpretative procedure.² Yet others do carry a conceptual meaning, but are undistinguishable from other expressions in terms of the concept they convey (e.g., *it* and *this/that*). These, I have argued, are undistinguishable with respect to the description they provide for the intended referent (an inanimate object). They can only be distinguished from each other in terms of the processing instruction they mark: personal pronouns mark a higher degree of accessibility than demonstrative pronouns.

Here is an example where the speaker repairs an *it* to a *that*, not because *that* better describes or identifies the entity referred to, and not because *that* is accompanied by some deictic gesture. Rather, *it* codes too high a degree of

accessibility for the word *awakened*:³

- (1) Melissa: Well, I'll say *awakened*_i, cause *that*_i's what I have written down.
 Ron: ... (Sniff)
 Frank: ... Just watch,
 He'll put a note by *it*_i—
 .. note by *that*_i.
 ... I really like that word_i Melissa (Household).

Although speakers mark as Given information units packaged as NPs, as whole propositions, as VPs, and as verbs (see Ariel 1985b, 1988b), and although all of these Given pieces of information may vary in degree of accessibility, I have concentrated on the intricate retrieval process involved in referential acts performed by NPs (Ariel 1985a, 1988a, 1990 and onwards).⁴

The structure of this paper is as follows. Section 1 presents the basic claims and findings of accessibility theory, emphasizing aspects of the theory which have sometimes been misunderstood (1.2, 1.3). Section 2 sums up recent research which corroborates and further develops accessibility theory. In Section 3, I argue that while accessibility theory is cognitively motivated, accessibility marking constitutes a linguistic proper phenomenon. Section 4 compares accessibility theory with other theories of reference, and Section 5 lists open questions for linguistic and psycholinguistic research of anaphora.

1. Accessibility theory: Basic claims and findings

1.1 Introducing accessibility theory

Accessibility theory argues that context retrievals of pieces of information from memory are guided by signaling to the addressee the degree of accessibility with which the mental representation to be retrieved is held. This assumption entails that speakers do not guide addressees' retrievals by referring them to the correct "geographic" source which serves as the basis for assuming that the information is Given. In other words, languages do not provide us with conventional codes specialized for (1) information retrievable from our general encyclopedic knowledge (e.g., there existed an entity by the name of Simone de Beauvoir), for (2) information extractable from the immediately available physical context (e.g., there exists a table between us), or for (3) information

previously mentioned in the discourse (e.g., that the speaker has a dear friend). I have argued against Clark and Marshall (1981) that proper names (e.g., *Simone de Beauvoir*) are not specialized for retrieving general encyclopedic information, that demonstrative pronouns (e.g., *this table*) are not specialized for retrieving physically salient objects, and that personal pronouns (e.g., *she*) are not specialized for retrieving from the preceding linguistic context. All of these referring expressions can and do retrieve from all three "geographic" contexts (see Ariel 1988a, 1998b). Instead, each referring expression codes a specific (and different) degree of mental accessibility (Ariel 1988a), and referring expressions are actually accessibility markers, i.e., expressions cueing the addressee on how to retrieve the appropriate mental representation in terms of degree of mental accessibility.

Based on distributional findings re such distinctions I have suggested the following accessibility marking scale (see Ariel 1990, p. 73), which proceeds from low accessibility markers to high accessibility markers:

- (2) Full name+modifier > full name > long definite description > short definite description⁵ > last name > first name > distal demonstrative+modifier > proximate demonstrative+modifier > distal demonstrative + NP > proximate demonstrative + NP > distal demonstrative (-NP) > proximate demonstrative (-NP) > stressed pronoun+gesture > stressed pronoun > unstressed pronoun > cliticized pronoun⁶ > verbal person inflections > zero

A point that needs clarification is the relevant domain in which degree of accessibility is assessed. What is the basis for our determining that a specific mental representation is of high or of low degree of accessibility (in the absence of direct tapping of the brain)? One potential source which determines degree of accessibility is the physical context of the speech situation. Another is the discourse world, where the discourse topics and other entities mentioned or reliably predicted to be relevant to the discourse at hand can receive high or low degrees of accessibility according to their discourse role. I have argued that it is the discorsal rather than the physical salience of the entities involved which determines the degree of accessibility assigned to particular mental representations (Ariel 1998b; see also Webber 1991). Although the physical context does affect the discourse model of the speakers, mental representations are a direct product of our discourse model only. One piece of evidence for this claim comes from references to the speaker. Although a (Hebrew) speaker can (almost) always refer to herself by a personal pronoun, she can cliticize the

pronoun, or she can use verbal person agreement (with a zero subject) or even zero subject alone (all are higher accessibility markers than a full pronoun), provided she is maximally accessible within the current discourse. In other words, whereas the physical accessibility of the speaker in the real world does not change in the course of the conversation, her discourse role and prominence in it may. It is the latter which determines whether the speaker can be referred to by higher accessibility markers than a pronoun. Indeed, Rieder and Mulokandov's (1998) analysis of two television interviews corroborates my initial findings (Ariel 1990, 1998b): Even turn-initial position shows an accessibility distinction re the speaker: The fuller form is preferred turn-initially, the shorter forms are preferred when immediately preceded by at least two previous mentions.

I have argued that the form-function correlations on the accessibility marking scale (namely, which referring expressions code which degree of accessibility) are not arbitrary. Three partially overlapping criteria are involved: Informativity (the amount of lexical information); rigidity (the ability to pick a unique referent, based on the form); and attenuation (phonological size). The prediction is that the more informative, rigid and unattenuated an expression is, the lower the degree of accessibility it codes, and vice versa, the less informative and rigid and the more attenuated the form is, the higher the accessibility it codes. Thus, "true" zero subjects (as in Chinese), verbal person agreement (as in Italian and Hebrew), cliticized pronouns (as in Hebrew and English), pronouns, stressed pronouns, demonstrative and definite NPs and proper names (of all kinds) are each specialized for (slightly) different degrees of accessibility, which accounts for their different discourse distributions.

Based on previous work (most notably Sanford & Garrod 1981; Givón 1983) and my own, I have suggested that we can tap the degree of accessibility associated with a given mental representation at a given moment by considering properties of the mental representation/ antecedent (not necessarily a linguistic one), as well as the relationship between the antecedent and the anaphor (the accessibility marker). Thus, the more salient the antecedent the more highly accessible it is deemed. I distinguished between global discourse topics (highest degree of accessibility), local discourse topics (relatively high degree of accessibility) and non-topics (relative low degree of accessibility) in this connection, as well as between the speaker and the addressee (high degree of accessibility) versus a referent which is neither (a 3rd person — a relatively low degree of accessibility). Another salience distinction depends on the automaticity/stereotypy of the inference required in generating a Givenness status

for an entity. Inferred entities come in different degrees of accessibility (see Sanford & Garrod 1981; Ariel 1985a, 1990, 1996; Oakhill, Garnham, Gernsbacher & Cain 1992; Gundel, Hedberg & Zacharski 1993; Garnham, Traxler, Oakhill & Gernsbacher 1996; Matsui 1998). Frame induced entities (e.g., waiters in restaurants) are more accessible than inferable entities which are not salient or necessary in a specific frame (e.g., umbrellas in restaurants). In fact, some inferential information is indistinguishable from explicitly mentioned pieces of information (see Beeman & Gernsbacher, Ms., and references cited therein). This accounts for the difference between initially referring to *the waiter* without any anchoring, versus to *Maya's umbrella* (the necessity to anchor the umbrella to a Given entity) in the context of a restaurant story. Another factor influencing the relative degree of accessibility of an antecedent is competition on the role of antecedent (see Clancy 1980; and see O'Brien & Albrecht 1991, for experiments establishing that we initially access multiple antecedents). The more potential antecedents there are, the lower the degree of accessibility each is entertained with.

The relationship between the antecedent and the anaphor, the degree of their unity, or cohesion (Ariel 1990), can be tight, in which case the degree of accessibility of the relevant mental representation is higher, or it can be loose, in which case degree of accessibility is lower. Such a relationship exists between linguistic units primarily (an antecedent and an anaphor). The distance between a previous mention of the same referent and the current mention is an obvious measure of an accessibility distinction. The larger the distance separating different mentions of the same mental entity, the lower the degree of accessibility with which the mental representation is entertained. But distance is not necessarily measured by words. Paragraphs and episode boundaries create a distance, despite the linear continuity (see Ariel 1990; Clancy 1980; Sanford & Garrod 1981; Tomlin 1987). At episode boundaries, people have difficulties accessing prior information (Beeman & Gernsbacher, manuscript; Sanford & Garrod 1981). Similarly, units (clauses) more cohesively linked entail more dependency in their interpretation, so that material from one clause is more readily available for the interpretation of another. Such constructions create higher degrees of unity and hence, accessibility. Looser connections, on the other hand, entail more independence in the processing of each clause, in which case there is less availability (accessibility) of material of one clause for the interpretation of the other. Such differences account for the different anaphoric patterns observed for subordinations (higher degree of accessibility — repeated proper names are clearly dispreferred) versus coordinations (a lower degree of

accessibility — repeated proper names are at least possible), nontensed (infinitival) versus tensed clauses (the former show a preference for zero subjects), and restrictive versus nonrestrictive relative clauses (the latter favor resumptive pronouns more often than the former).

In sum, I have argued that referring expressions are chosen according to the assessed degree of accessibility of the mental entities corresponding to them. Degree of accessibility depends on factors related to the inherent salience of the entity and on the unity between the antecedent and the anaphor. In addition, the conventional degree of accessibility coded by referring expressions is motivated by their relative informativity, rigidity and attenuation.

1.2 Accessibility as a complex concept

I have tried to emphasize that assessing degree of accessibility is a complex matter, since multiple factors are involved. It is the complex concept of accessibility which determines referential form, and not any single factor. This is why when we examine any one factor of accessibility, the results are significant, but far from absolute (see Ariel 1999, on resumptive pronouns and Garcia 1996, on reflexives and pronouns in Spanish). Accessibility factors may converge on pointing to a high (or low) degree of accessibility, as when the speaker or the addressee (highly accessible) is also the global discourse topic (highly accessible), or when the discourse topic has been recently mentioned (high accessibility), and/or has been mentioned numerous times (high accessibility). However, although distance, for instance, is a crucial factor determining degree of accessibility, it cannot be taken to perfectly represent the overall degree of accessibility involved. For instance, pronouns (high accessibility markers) can sometimes (over 25% in my data — see Ariel 1990, p. 18 for sources), refer to mental entities last mentioned in a previous rather than a current paragraph (entailing a lower degree of accessibility in terms of distance). The reason is that these distant references are mostly references to the global discourse topic (92%). Discourse topics can maintain a relatively high degree of accessibility despite the larger distance. The same clash would explain why it is that when two entities are introduced (e.g., *Maya, kissed Rachel_j*), the first mention topical but relatively distant NP (*Maya*) is later coded as an unstressed pronoun (a higher accessibility marker), whereas the more recent, nontopical NP (*Rachel*) is coded by a stressed pronoun (a lower accessibility marker) (e.g., *and then she_i/SHE_j*). Similarly, Brennan (1995) found that nonprominent entities (less salient) were referred to by full NPs (low accessibility markers) rather than by

pronouns (high accessibility markers), despite the recency of their mention (high accessibility).

The more previous mentions an antecedent has enjoyed, the higher its accessibility. Still, discourse topics can usually be referred to by high accessibility markers despite a low count of previous mentions. Perhaps this is due to the fact that some entities, discourse topics more than others, are inferred to be present even when explicit mention is lacking (see also Grosz, Joshi & Weinstein 1995; O'Brien & Albrecht 1991;).⁷ Maes and Noordman (1995) find that 54.2% (682) of their demonstrative + NP expressions (1259, in Dutch) are a second mention reference to an entity (or proposition) just mentioned (in the same or previous sentence, for the most part). Since a modified demonstrative pronoun is an intermediate accessibility marker, but the distance factor points to a high degree of accessibility, this finding appears to be a counter-example to accessibility theory. However, a newly introduced discourse entity (and even more so when the antecedent is complex — a proposition) is not instantaneously highly accessible enough for further references by high accessibility markers (as they note themselves in note 15; see Ariel 1990; Clancy 1980; Du Bois 1980; Du Bois & Thompson 1991; Tao 1996).⁸ Similarly, turn-initial positions are expected to contain lower accessibility markers (they form a discourse break). Rieder and Mulokandov (1998) then explain the surprisingly high occurrence of zeroes and cliticized pronouns for first person references in initial turn position (in Hebrew) by noting that the preceding turn was a question addressed to the speaker in an overwhelming majority of these cases. We must not therefore mistake the individual factors contributing to degree of accessibility (e.g., turn-initial position) for criterial conditions on linguistic usage.

A study of resumptive pronouns versus gap usage in conversational Hebrew relative clauses (Ariel 1999) revealed that nonrestrictive relative clauses (relative lower degree of accessibility of the head when the relativized position is processed) contain many more resumptive pronouns than restrictive relative clauses (relative higher degree of accessibility). Still, two thirds of the nonrestrictive relative clauses contained gaps rather than resumptive pronouns. This might again seem a counter-example to accessibility theory, since an extremely high accessibility marker (the gap) is used when the degree of accessibility hypothesized between the head and the relativized position is relatively low. However, in close to three fourths of these gapped cases, the relativized position is a subject (rather than an indirect object, for example). Subject position is assigned to prominent entities, ones which are of a higher degree of accessibility.

In general, I found that a *combination* of accessibility factors (head complexity, distance, grammatical role of the relativized position, and restrictiveness) predicts the occurrence of gaps and resumptive pronouns better than any one of the above factors. This is so because any particular instance may involve values for both high and low accessibility, and it is only the assessed combination of these factors (as well as others) which determines the overall degree of accessibility dictating the form chosen by the speaker. Note also that it is only the general concept of degree of accessibility which can account for why a variety of factors which seem unrelated to each other (e.g., the restrictiveness of the relative clause, grammatical role, whether the head is long or short, etc.) all encourage or discourage the usage of a resumptive pronoun. Garcia (1983, p. 203) similarly shows how the higher accessibility marker is chosen for cases where the antecedent is a nearby grammatical subject, as well as for cases in which the antecedent is contextually salient, although grammatically speaking, there is no similarity between these two conditions.

The form-function correlation for reflexive pronouns (e.g., *herself*) also demonstrates how degree of accessibility cannot automatically be determined. I had probably mistakenly classified reflexive pronouns as higher accessibility markers than pronouns (Ariel 1990), because their antecedents are (for the most part) very local (within their C-command domain). Note, however, that reflexive pronouns are less attenuated than pronouns (in English), and should have therefore been relatively lower accessibility markers under accessibility theory. Now, this marking exception could be explained by reference to the high frequency of pronouns versus reflexives (unmarked forms tend to be short), but I think an alternative explanation, one based on the historical development of (English) reflexives (see Faltz 1977; Keenan 1994), shows them to be lower accessibility markers than pronouns, despite the fact that they are locally bound, whereas pronouns are locally free. Reflexive pronouns within the C-command domain are basically pronouns referring to unexpected entities. Their antecedents are quite accessible in some absolute sense, but they are not expected (and therefore accessible) *in the specific role* they actually occur in (which is coded by the reflexive). The same applies to the contrastive pronouns in Dutch, as analyzed by Comrie (1994).

It is illuminating to compare locally bound coarguments of the same verb (accusatives and objects of prepositions) with locally bound nonarguments in Old English (Keenan 1994). The latter are referentially dependent on the subject, and they mark a high involvement of the referent in the event (e.g., *The king walked him to London*). These high involvement nonarguments are coded

by pronouns. But coarguments which are objects of verbs of serious personal harm (e.g., *threaten*, *kill*) are invariably coded by pronouns + *self*. The reason is that coarguments of the same verb (especially of the above kind) are expected to be disjoint in reference, since we are expected not to hit or threaten ourselves (Faltz 1977; Farmer & Harnish 1987). Hence, the argument is expected *not* to be coreferent with the subject. The referent of the subject in such contexts is then of a lower degree of accessibility in the object *role*, and a lower (less attenuated) accessibility marker (a pronoun+*self*) is used. We see that it is indeed the degree of expectation (accessibility) for subject coreference that matters (rather than argument versus nonargument role) when we compare the accusatives of bodily harm with those of verbs of grooming (e.g., *dress*). Unlike the former, the latter do create a high expectation for subject coreference (we are expected to dress ourselves), hence the accessibility of subject coreference for the object is high, and indeed they take regular pronouns, rather than reflexives in Old English (e.g., *She dressed her*). What is crucial for accessibility theory at this point is that we realize that a relatively lower accessibility marker (the reflexive) can grammaticize for a syntactic context that other things being equal is considered to be a very high accessibility context, namely the C-command domain. When the entity (although highly accessible) is not predicted to appear in a certain role, its degree of accessibility is (relatively) low, despite the short distance from the previous mention, and despite the fact that its previous coding marks it as highly accessible (subject).

For the same reason, namely the complexity involved in accessibility assessment, I believe Givón (1992) was too hasty in his conclusion that accessibility is reducible to a binary distinction in language. Givón finds that the definite descriptions in his data retrieve antecedents which occurred at a variety of distances, unlike zeroes and pronouns, which retrieve discourse entities mentioned 1–2 clauses back for the most part. We should remember, however, that accessibility cannot be established on the basis of one factor (distance in this case) and that definite descriptions do not actually constitute a homogenous category of referring expressions in terms of degree of accessibility (see Almor 1999; Ariel 1990, 1996). First, the fact that definite descriptions retrieve antecedents from many distances can be explained by reference to other factors involved in assessing degree of accessibility: grammatical role (i.e. subject versus nonsubject), degree of discourse salience (topicality), paragraph and frame boundaries, the number of previous mentions, etc. In other words, one should examine the “exceptional” short-distance definite descriptions and establish that they do not actually code a low degree of accessibility despite the

short distance. Only highly accessible entities (as measured by a comprehensive assessment of degree of accessibility) which are coded by low accessibility markers nonetheless constitute counterexamples to the theory. Toole (1992, 1996) checked such cases and found that the majority of these can be explained within a more complex assessment of degree of accessibility (plus intended divergences produced in order to generate special implicatures — see 2.1 below). The accessibility factors considered by Toole were: (1) Distance (whether anaphoric expressions corefer with antecedents in the same or in the last proposition, in the same or in a previous episode); (2) Topicality (how many times the antecedent was mentioned in the last four propositions); (3) Competition (how many matching intervening entities there were between the last mention of the antecedent and the anaphor). Second, when I divided definite descriptions into lower and higher accessibility markers according to their degree of informativity, consistent distributional differences were discernible. In Ariel (1990, p. 44), I presented data which showed that whereas the majority (78.2%) of definite descriptions composed of 1–2 content words were discourse anaphoric (higher accessibility), the majority (65.3%) of the definite descriptions which contain 3+ content words were first mentions (lower accessibility). In Ariel (1996) I distinguished between definite descriptions of 1, 2, and 3+ content words, as well as definite NPs + relative clauses, all as introducers of new discourse entities. Indeed, the lower the accessibility of the entity introduced, the more informative the referring expression was.⁹

1.3 On the nonexclusivity of accessibility considerations

While accessibility considerations are a central aspect of referential choices, they by no means exhaust the selection process. Contextual assumptions must be relied upon in order to ascertain that a referential (rather than attributive or generic) use has been made (see Mueller-Lust & Gibbs 1991). Relevance-based considerations help select among equally accessible potential referring expressions, such as *my neighbor*, *the mayor*, *Mark* and *the idiot*. Inferential processes are also crucially involved in determining reference, as in *Horrified, she snatched the meat_i from the dog_i, and threw it_i into the fire* (from McEnery & Thomas 1992; see Ariel 1990, Part III; Comrie 1988b; Gundel et al. 1993; Gundel & Mulkern 1998; Matsui 1998, inter alia Sanford & Garrod 1981). Such considerations may sometimes even dictate violations of accessibility theory for special effects (see Ariel 1990, Part III).¹⁰ Thus, I have argued that women and minorities are consistently referred to by higher accessibility markers than are called for given

the specific (relatively low) accessibility assessment (initial references), because speakers are not careful enough in making sure their addressees actually identify the referents intended. The clearest example for this phenomenon is the wide-spread use of first names for women and minorities (for data and analysis of references to the 'other', see Ariel 1990, 9.2; and see Mulkern 1996, p. 247). Such violations are very much socially and culturally bound. Indeed, there is a rich anthropological linguistics literature on naming patterns in different societies, which shows how the universal accessibility marking scale is embedded in social norms.

I here mention one such example of a cultural difference, from the Nayaka, a hunter-gatherer group in India. Bird-David (1995) finds that names are not the rigid designators we usually think of. They function quite differently, and are rarely used in this society. Children are referred to as 'girl' or 'boy', or in relational terms, e.g., 'daughter', even by non-parents. Adults are mostly referred to by kin terms, which is a mark of intimacy (rather than their names). It is mostly adolescents that are referred to by nicknames. But names are not even necessarily constant in a person's life. People may have a number of names simultaneously. Bird-David notes that her informants sometimes asked people what they are called these days, even though members of the community live in extreme proximity to each other, and are in constant contact, even in their home-huts.¹¹ In contrast, Downing (1996, p. 130) argues that bare proper names are co-recognitional, and are used when "present in the territory of information of both participants" (of the conversation). Only when the referents do not meet this condition other referring expressions are used (e.g., *this* + proper name). It remains to be seen how general this principle is (I had independently made similar claims for Hebrew — Ariel 1990, pp. 203–206), in view of the Nayaka pattern.

Note that although accessibility theory defines the relevant degree of accessibility to be that of the addressee as assessed by the speaker, a speaker may pretend to speak for another, and she then has to assume the degree of accessibility of the entity as it would have been assessed by that speaker. This is what happens in example (1) above when Frank is assuming the teacher's identity who will be reading Melissa's paper. He refers to *awakened* by a lower accessibility marker, *that word*, since the teacher will have no basis for assuming that the word is highly accessible to Melissa when reading his comments.

Following Kuno (1987), I have also claimed that higher accessibility markers are used to code the character whose point of view is reflected in the discourse (Ariel 1990, pp. 203–204). The examples below demonstrate this

clearly. (3) and (4) are excerpts describing the same rape by two Hebrew newspapers (*Haaretz* and *Maariv*). Both newspapers relied on the same source: the police record, and hence the extraordinary similarity. Note that *Haaretz* and *Maariv* differ in that only *Haaretz* clearly adopts the victim's point of view. This can be seen from: a. the choice of subject role in describing the meeting between the rapist and the victim (*Haaretz* chose the victim, *Maariv* chose both the rapist and the victim), b. the choice of verb for the rapists expressing interest in having sex with the victim (*demand* in *Haaretz*, *asked* in *Maariv*), c. the addition of 'as a result' adverbial in *Maariv*, making the rapes appear to be the result of the victim's refusal:

- (3) i. In the complaint *the woman_j*, claimed that on May 2, *0_j* met *Roter_i* ...
 ii. Then *the two_{i+k}* demanded from *her_j* to have sex with *them_{i+k}*.
 According to *her_j*, when *0_j* refused, *Roter_i* started punching *her_j*...
 (*Haaretz*, 5.17.1995).
- (4) i. According to the police, *Roter_i* and *the rape victim_j*, met in the beginning of May...
 ii. ... and at a certain point *0_{i+k}* asked *the rape victim_j* to have sex with *them_{i+k}*. *This one_j* refused, and as a result, *the two_{i+k}* cruelly raped *her_j*... (*Maariv*, 5.17.1995).

Note that in both papers the victim and the rapist are initially introduced (in this narrative) by a low accessibility marker, as is appropriate. It is in (ii) that the difference in point of view clearly shows itself in referential forms as well: In *Haaretz* the victim is coded by 0, and the rapist by a proper name (a low accessibility marker); In *Maariv* the rapists are coded by 0, and the victim is referred to by a demonstrative pronoun (a mid accessibility marker). When comparing all the zero versus pronoun ratios in the two papers, *Haaretz* has 6 zeroes versus 2 pronouns for the victim, but *Maariv* has precisely the opposite ratio: 6 pronouns versus 2 zeroes for her (pronouns here include demonstrative pronouns). The newspapers do not differ with respect to the zero/pronoun ratio for the rapists (1.4 and 1.3 times more zeroes respectively). Similarly, Givón (1998) finds that in his own unpublished novel, for which he has two versions, one from the perspective of one character and one from the other's, all the full NPs were reserved for references to the character whose point of view was *not* being represented.¹²

A few additional examples of why accessibility theory can only account for default referential choices follow. Du Bois (1991) discusses what he terms

analogue reference, namely, cases where the speaker refers to X, but intends the addressee to derive from it also a reference to Y as a conversational implicature. Such references may not only violate the requirement to select referring expressions according to the degree of accessibility of the mental representation at hand, they may ignore the accessible/inaccessible distinction, referring by an indefinite NP to a referent previously identified by a definite NP (One of his examples has: *The cook_i* followed by *a cook_i*). Hakulinen (1987) argues that Finnish speakers avoid personal references, and thus, generic zero references are by now almost completely conventionalized as first person references. The next, originally Hebrew, example shows the speaker oscillating between 1st and 3rd person references to himself:

- (5) But I_i insisted then. A person_{jR} devoted two months and a half, 0_{jR} built a whole program, 0_{jR} took care of a budget, it is not as if Minister Katzav gave me_j, I took care, I went... (Mudai, TV interview, 2.11. 1998, from Mulokandov and Rieder 1998).

The speaker here is clearly understood to be speaking of himself, but he is trying to create the impression that he refers to himself from an objective, "other", rather than "self" point of view. Hence the 3rd person "inappropriate" generic references to an indefinite person, which combine with predicates which unequivocally describe his and only his actions. Sanford and Moxey (1995) show that despite the theoretical (high) accessibility of some discourse entities, they are not easily referred to:

- (6) In the garden, I saw a young girl_i kicking a tree_j,
 ?I looked at *them*_{i+j} for a while (Sanford & Moxey's example 17, 17').

The ability to refer to even highly accessible entities is relevance-based. In a different context, the above example is perfectly acceptable, as they show. Indeed, accessibility theory takes it for granted that speakers have already decided on who to refer to, even though it is not at all a cut and dry decision, simply depending on "who did what to whom". This is clearly seen in the following example, where the speaker switches from his initial *we* to a *he*. It is certainly not because he has suddenly realized that the string is Yo Yo Ma's, rather than the whole dance group's:

- (7) Morris: We broke a STRING,
 Or HE broke a string (A TV interview with Yo Yo Ma and Mark Morris,
 a choreographer, Israeli TV, 7.9.1998).

Such choices of referential forms are made independent of accessibility theory, and they generate a whole array of conversational implicatures (in this case, how Mark Morris sees Yo Yo Ma as integral to his show).

Maes and Noordman (1995) argue that a combination of a demonstrative pronoun and a noun phrase is used when the NP serves a predicational rather than an identification function. Such expressions are actually used in order to modify the addressee's representation of the intended entity. A lower accessibility marker is then used for such a marked purpose. The marked accessibility marker (there is a mismatch between the high degree of accessibility and the accessibility marker chosen) conveys information which the speaker directs the addressee to access in connection with the referent. For example, when the expression *This Reagan* follows the sentence *Ronald Reagan is clearly suffering from memory failure*, it is interpreted as 'the Reagan suffering from memory failure' (see their example 17).

Taken together, Sections 1.2 and 1.3 argue that accessibility theory is not reducible to any one linguistic principle, because degree of accessibility is a complex psychological concept, and at the same time, that accessibility theory cannot exclusively account for referential choice and interpretation.

2. Corroborating and enriching accessibility theory

I have presented many pieces of evidence for the applicability of accessibility theory in Ariel (1985a, 1988a, 1990). The reader is referred to those sources for original analyses of mine and for extensive references to other works which support the accessibility claim. More recent research has corroborated and enriched the applicability of accessibility theory. I here restrict myself to citing works I did not have access to when initially presenting accessibility theory (even though some had been published before). Much of the work to be mentioned was conducted independently of accessibility theory, some is a direct product of it.

2.1 General accessibility predictions

This section is dedicated to supporting general accessibility theory points: I quote works which argue for the replacement of formal conventions with what I would term degree of accessibility codings (Comrie, Garcia). I present distributional analyses of a variety of referring expressions (Saadi, Toole, Dolman),

all of which point that accessibility considerations (e.g., distance, competition, antecedent prominence etc.) are at work. Some also argue that genre differences do not refute the validity of the accessibility proposal (Toole, Dolman, Saadi, Kronrod and Engel). I present findings which confirm that degree of accessibility is a dynamic and complex notion which cannot be reduced to single factors (Gernsbacher et al., McKoon et al., Toole, Kibrik), and that it is not the only factor determining referential form (Kronrod and Engel, Almor). Finally, I present research which develops accessibility theory beyond my original proposals (Almor, Epstein).

Comrie (1994) shows how Dutch contrastive pronouns refer to the less expected antecedent (lower accessibility on my account). While in most cases this means a nonsubject, it is not invariably so. Comrie argues that it has to be the nontopic actually. Garcia (1983, 1996) argues that what seems to be a difference between subject versus nonsubject antecedent (for *si* versus *el* in Spanish) is a difference in "contextual obviousness", what I would term degree of accessibility. Indeed, in many cases, antecedents of high accessibility are also subjects, but Garcia demonstrates how non subject antecedents can take *si* anaphors, provided they are highly accessible (e.g., discourse topics). Assuming an accessibility distinction between *si* and *el* can also explain the higher frequency of *si* (the higher accessibility marker) with human versus nonhuman antecedents. In addition, Garcia (1996) specifically relates the fact that *si* does not distinguish for gender to its marking a higher degree of accessibility (my terminology) than the pronominal forms, which do. This corresponds to my Informativity criterion for accessibility marking. She also examines the role of competing antecedents and determines that the more salient the non-antecedent competitor, the lower the accessibility marker required for the antecedent. Finally, Garcia finds that the higher accessibility marker is preferred when the argument is governed. I have suggested the same for gap versus resumptive pronoun usage (Ariel 1999). Governed arguments are more predictable and hence more accessible.

Saadi (1997) examined the English and Hebrew versions of one children's story and one adult story. Her findings support the accessibility predictions. All four sources shifted from a predominant use of zeroes and pronouns to lexical NPs as the distance from the last mention of the same entity was larger. The same applies to the factor of competing (intervening) referents: the more intervening characters mentioned, the higher the likelihood for a lexical NP to occur. All sources also distinguished between the main character (more salient, mentioned more times) and a secondary character, so that the main character

was referred to by high accessibility markers much more often than the secondary character. In both languages there was also a difference between the adult and the children's stories (more so in Hebrew), in that the children's stories contained more lexical NPs. Saadi suggests that this difference is due to the fact that adults writing for children assume that children's short term memories are not fully developed.

McKoon, Ward, Ratcliff, and Sproat (1993) testify to the fact that degree of accessibility is a complex concept, the components of which may work in opposite directions, as when the antecedent is part of a compound (accessibility is lower) but the entity is topical (higher accessibility). Kibrik (1996) shows that degrees of activation dictate referential forms in Russian narratives. He also underscores the importance of the multiplicity of factors involved in determining degree of accessibility.

Toole (1992, 1996) has convincingly shown how degree of accessibility, when measured by a few criteria (see 1.2) can explain the distribution of referring expressions in four discourse genres. Her conclusion is that despite the statistically reliable differences in referring expressions in different genres (see Fox 1987), accessibility theory can account for referential choices in all the written and spoken genres she examined. The statistical differences found stem from contextual factors which determine what types of discourse entities (in terms of degree of accessibility) tend to occur in discourses of different genres. In other words, a case by case analysis of the referring expressions used in all the genres revealed the same accessibility form-function correlations. Toole found that accessibility marking violations are only performed in order to achieve special objectives, e.g., low accessibility markers to clarify at the addressee's request, to define a term etc (see also Ariel 1990: Part III; Maes & Noordman 1995; Vonk, Hustinx & Simons 1992). Dolman (1998) too found no differences in referential choice between children from high and low socioeconomic backgrounds.¹³ Both groups complied with accessibility theory (degree of accessibility measured as a combined function of distance from last mention and the importance of the character to the story).

Kronrod and Engel (1998) reached similar conclusions in their examination of referential forms used in newspaper headlines (see also Jucker 1996). They found no genre differences between the high brow subscription paper and the news stand popular papers, and between the different sections within the papers (front page, other news items, stories and sports). All the headlines showed a clear preference for intermediate accessibility markers (first names, last names and short definite descriptions). The fact that intermediate accessi-

bility markers predominate, despite the initial retrieval status, where low accessibility markers are expected, is explained by reference to Du Bois' (1985) notion of competing motivations. Headlines must be short and vague (in order to save space and arouse curiosity). High accessibility markers would have served that function best. But because the referents are also initial retrievals, and hence of a rather low degree of accessibility, a compromise is struck, and most of the referential forms are of an intermediate degree of accessibility. Here is (my own, originally Hebrew) illustrative example. Compare the referring expressions in the headline (a) with their counterparts in the opening sentence of the article (b):

- (8) a. *Arafat_i invited Kadafi_j to pray in Jerusalem_k, when θ_k will be the Palestinian capital.*
 b. *The Palestinian authority chair, Yassir Arafat_i, invited the Lybian leader, Muamar Kadafi_j, to pray in Eastern Jerusalem_k, when this one_k will become the capital of the Palestinian state (Haaretz, 7.14.1998).*

Gernsbacher, Hargreaves, and Beeman (1989) show how and why degree of accessibility of concepts shifts in the course of discourse. Sentential first mention entities are later entertained at a relatively high degree of accessibility due to comprehenders' assumption that first mentions are the discourse topic.¹⁴ But mention in the last clause also facilitates retrieval, due to the high accessibility associated with the last clause processed (Clark & Sengul 1979). As Gernsbacher et al. (1989) noted, these two facilitating conditions sometimes contradict each other. In a series of experiments measuring accessing speed at different processing stages, Gernsbacher et al. were able to establish that degree of accessibility is a dynamic phenomenon. Thus, an entity mentioned clause-initially is less accessible than a more recently mentioned entity at first, but later, it gains in accessibility, as the units in which the two entities appear are integrated into one whole. In other words, recency is a short-term accessibility booster, whereas sentence-initial mention is a long-term accessibility booster. That the time in which we measure degree of accessibility is of the essence can also be seen in an experiment by Gernsbacher (1989).

Almor (1999) embeds my initial proposal that referring expressions are "price tags" on processing effort in a more comprehensive system of processing assessment. Other things being equal, low accessibility markers take longer to process than high accessibility markers. Anaphors with a high informational load (roughly low accessibility markers) are easier to process when the antecedent is of a relatively low degree of accessibility (a nonfocussed antecedent).

The same low accessibility anaphors are harder to process if the antecedent is highly accessible. This seems to echo the “repeated noun penalty” (see Gordon, Grosz & Gilliom 1993; Gordon & Scearce 1995). At the same time, I have argued (Ariel 1990, chap. 9) that intended divergences from appropriate accessibility marking are possible, but limited to cases where specific conversational implicatures are sought, above the referential function. I reasoned that the extra contextual implications justify the extra-processing cost. Almor formulates this intuition into a principle whereby “additional cost must serve some additional discourse function” (p. 5), such as adding some new information about the referent (and this is contra the “repeated noun penalty”). In this way, Almor integrates the cognitive approach with the pragmatic approach. Thus, high accessibility contexts can accommodate relatively low accessibility markers, provided increased contextual effects result. Almor then underscores the fact (convincingly illustrated also by Maes & Noordman 1995) that we cannot really account for the distribution of referring expressions by reference to the referential function of NPs alone. In fact, his experiments demonstrate that low accessibility markers are relatively easily processed, despite the high accessibility of the antecedents, provided they add some new information about the referent.

Almor (1999) is mainly interested in processing effort: He wants to calculate the ease of processing anaphors as an interaction of three factors: discourse focus (i.e., degree of accessibility), the amount of new information contributed by the anaphor, and the information load differential between the antecedent and the anaphor. Informational load is not equivalent to my Informativity criterion. It is calculated as the conceptual distance between the anaphor and the antecedent. In order to assess this difference, Almor draws distinctions among antecedents and anaphors not previously made by accessibility theory, such as between more general (and less informative) terms (e.g., *the bird, a creature*) and more specific (and informative) ones (e.g., *the robin, an ostrich*), between more versus less typical instances of a category (e.g., ‘robin’ vs. ‘ostrich’). His experiments show different response times to different pairs of antecedent/anaphor according to these distinctions, some of them, even somewhat counter-intuitive (e.g., that the same anaphoric expression, e.g., *the bird* will be processed faster when anaphoric to an antecedent which is a less typical member in its category (e.g., *an ostrich*) than when it is typical (e.g., *a robin*), when both are focused. Almor thus adds another dimension to the antecedent-anaphor relation that I did not discuss, that of conceptual difference.

Finally, Epstein (1998b) extends the concept of (low) accessibility to in-

clude the accessibility of new discourse entities as well. His claim is that low accessibility characterizes the appropriate use of definite descriptions referring to entities which lack a previously stored mental representation, so that the addressee is instructed to construct a new representation, the definite article marking that the knowledge required for the construction is accessible. Such accessibility for non-Given entities can derive from the high prominence of the entity, from the fact that it is a frame-appropriate inferred role, or from the accessibility it has for a noncanonical narrator.¹⁵

2.2 Accessibility predictions pertaining to the type of antecedent

Recall that accessibility theory predicts that the higher the accessibility with which the mental representation is entertained, the higher the accessibility marker used to retrieve it (and vice versa for low accessibility). I present below recent findings corroborating this claim. Gernsbacher (1990) proposes the structure building framework, according to which when comprehenders are engaged in constructing mental representations for incoming information, their strategy is to build coherent structures, by first laying a foundation and then incorporating information that coheres with the foundation into it. Less coherent information makes comprehenders shift to a new constructed structure. According to Gernsbacher, two very basic cognitive processes are enhancement and suppression. These bear direct relevance for accessibility theory. Enhancement mechanisms elevate the degree of accessibility of memory nodes, suppression mechanisms reduce it. Enhanced entities “overshadow” and suppress the activation of other discourse entities. They are also more resistant to being suppressed by other discourse entities (see Gernsbacher and Jescheniak ms). One example of an enhanced entity is a “cataphoric” NP. Gernsbacher and Shroyer (1989) distinguish between NP forms as to degree of “cataphoricity”, namely how marked they are for potential further references (see also Downing 1996; Sanford, Moore & Garrod 1988).¹⁶ The assumption is that the way in which discourse entities are introduced (e.g., by an indefinite article versus by an indefinite *this*, in English) give rise to different expectations re further mentions (see also Givón 1992, about the interaction of grammatical role with marking by an indefinite *this*; Mueller-Lust and Gibbs 1991, on proper names; and Sanford et al. 1996, and Paterson et al. 1998, about quantified NPs as antecedents).

Translated into accessibility terminology, “cataphorically” marked discourse entities become relatively more salient antecedents, because they occupy a privileged position among mental representations. They should therefore be

referred to by relatively higher accessibility markers, and they are.¹⁷ However, NPs are not simply classified into + versus — “cataphoric”, i.e., as + versus — self-enhancing and other-suppressing. Some (e.g., contrastive stress) are more “cataphoric” than others (indefinite *this*), that is, they trigger a higher degree of activation, so their antecedents are more highly accessible. Gernsbacher (1989) also shows how the introduction of different, even new discourse entities suppresses the accessibility of current discourse entities, even if these have been established as topics before. I have referred to this phenomenon as competition, which, I argued, lowers the accessibility of all discourse entities (see Garcia 1983, p. 200, for why pronouns rather than short reflexives are sometimes used for the accessible discourse topic for this reason; Halmari 1996, p. 172, and Keysar et al. 1998, for why some competition is or is not a problem after all).

Other nominal forms may be distinguished as to discourse prominence and hence to degree of cataphoricity. Halmari (1996) shows how zeroes, pronouns, demonstrative pronouns, proper names and definite descriptions signal different degrees of accessibility, by examining the grammatical role of their antecedents. The assumption is that subjects are used for more highly accessible entities than other grammatical roles are. And indeed, 98% of the zeroes she found had subject antecedents. The same applied to 72.5% of the pronouns, but the antecedents for demonstrative pronouns, for example, were evenly distributed among all grammatical roles. About 30% of the proper names and the definite descriptions refer to genitive antecedents (as opposed to 1% of the zeroes and 13% of the pronouns). Indeed, Gordon et al. (1993) and Gordon and Chan (1995) found that the “repeated name penalty” (using too low an accessibility marker) applies to subjects, but not to other syntactic statuses. Stebbins (1997) shows how some languages use number marking cataphorically (my term) only or preferentially for establishing new discourse entities, linking this usage to the high Informativity involved in nouns marked for number. Such languages may omit number marking in subsequent mentions. The same goes for noun classifiers and noun particles (see my interpretation of Hinds’ (1983) findings re Japanese in Ariel 1990, p. 90).

Sproat and Ward (1987) and McKoon et al. (1993) (see also Greene, Gerrig, McKoon & Ratcliff 1994; Ward, Sproat & McKoon 1991) present similar findings. Sproat and Ward and McKoon et al. show how the way we present a concept in the discourse affects its degree of accessibility, even if it is not actually introduced as a discourse entity. This in turn affects referential options and ease of processing, as measured by reading times. For example, McKoon et al. compare anaphoric references to the non referential ‘deer’ in

deer hunting versus the referential 'deer' in *hunting deer*. Indeed, when the discourse creates a high degree of accessibility, an "illicit" (nonreferential) antecedent is properly referred to even by the high accessibility pronoun. McKoon et al. then conclude that syntactic factors contribute to the determination of degree of accessibility (and the same could be claimed for subject position proved crucial by Halmari (1996)). I tend to think the other way round, namely that it is degree of discourse prominence which influences both syntactic role and degree of accessibility (see also Gundel et al. 1993). In other words, more important entities will be introduced as referential, rather than as nonreferential, as subjects rather than as nonsubjects.

Oakhill et al. 1992 show how depending on the antecedent, conceptual anaphors (e.g., *I need a plate. Where do you keep them?*) are appropriate, though at some processing cost. In general, they show that depending on the degree of the accessibility of the antecedent, different referring expressions are appropriate. Garrod and Sanford (1982) and Albrecht and Clifton (1998) find that an entity coded as an NP conjunct constitutes an inferior antecedent (less accessible) so references to it take longer to process.

Almor (1999) demonstrates the role that focus plays in raising the degree of accessibility of an antecedent. Referents coded by focussed NPs and later referred to by anaphoric expressions were read faster than referents coded by nonfocussed NPs. Conversely, Alzheimer Disease damages working memory. Almor (in press) then explains why Alzheimer patients prefer references by lower accessibility markers (repetitive definite descriptions) over the more context-appropriate high accessibility markers (pronouns). Arnold (1997, to appear) corroborates Almor's (1999) findings, but then seeks to explain the apparent puzzle of why topic (old information) and focus (new information) both facilitate reference interpretation. The reason is that despite the differences in the nature of the information they themselves convey, both elevate the degree of accessibility of the entity they are associated with. Arnold also finds that the global topic has a stronger effect than focus or local topic. This is important in that it shows that we cannot substitute the complex concept of degree of accessibility with simple rules such as "if anaphoric with a subject, or with a focussed NP, or if a sentence topic, then the mental representation intended is to be coded by a high accessibility marker" (see also Arnold to appear).

2.3 Accessibility predictions pertaining to the type of anaphor

Accessibility theory predicts that accessibility markers which are relatively uninformative, nonrigid and attenuated retrieve highly accessible mental representations (the opposite holds for low accessibility markers). The researchers here mentioned support this claim by pointing to the correspondence between degree of antecedent accessibility and the informativity, rigidity or attenuation of the anaphor. Fowler, Levy, and Brown (1997) note that the same conditions which encourage the usage of pronouns (high accessibility markers) also encourage the shortening of the pronunciation of proper names (thereby making them signal a higher degree of accessibility). Brennan (1995) found that subjects lengthened their pronunciation of pronouns (thereby turning them into slightly lower accessibility markers) when the antecedents were nonsubjects (a lower degree of accessibility). Downing (1986) argues that Japanese classifiers are used as anaphoric expressions, the degree of accessibility (my terminology) they mark being in between pronouns and lexical NPs. Because of their high informativity, classifiers can refer to relatively distant antecedents, and in contexts where there are intervening antecedents. Both contexts are indications of an intermediate degree of accessibility.¹⁸ Garnham et al. (1994), Rinck and Bower (1995), and Cacciari et al. (1997) present evidence for the importance of gender marking (even if it is arbitrary gender) — my informativity criterion.¹⁹ Mithun (1996) shows how prosodic cues affect the degree of accessibility coded by the same accessibility marker, a definite NP. She distinguishes between lexical NPs which occur in separate intonation units, those that do not, and those that occur in the more Given syntactic position (postverbally in Central Pomo) with a specific intonation.²⁰ Baker (1995) presents data showing that discourse prominence and contrast determine the appropriate usage of English free reflexive forms (i.e., unbound reflexives). Although he does not note this, a superficial count of the data he quotes reveals a difference between bare reflexives (relatively attenuated) and reflexives combining with pronouns and lexical NPs (less attenuated expressions). The former mark a higher degree of accessibility than the latter.²¹ Thus, languages can utilize very many additional formal markings than I have originally listed (see Ariel 1990, pp. 69–93, on the universality of the accessibility marking scale). Obviation, logophoric forms and switch reference systems come to mind (on the latter see Ariel 1990).

Mulkern (1996, p. 245) notes how full names function differently from partial names (and see Ariel 1990, pp. 36–46). The latter mark a higher degree

of accessibility because they are less informative. Lichtenberk's (1996) data can be adduced in support of my claim that proximate and distal demonstratives show an accessibility distinction, and not just a deictic distinction. When tracking discourse entities, the distal demonstrative + NP retrieved entities mentioned more than twice the distance of the antecedents of the proximate demonstrative + NP. Brizuela (1997) shows that a demonstrative NP codes a higher degree of accessibility than a demonstrative pronoun + a definite marker. Interestingly, the same distinction in Hebrew is merely a register difference. Once again, we see that length of expression, not necessarily accompanied by additional content, determines a lower degree of accessibility. Onishi and Murphy (1993) note that metaphoric references (too low accessibility markers) to the topic slow subjects down, even though the same metaphors do not slow them down when they do not serve as referring expressions. Beun and Cremers (1998) find that speakers use redundant information (making their expressions code a lower degree of accessibility) when referring to physically available objects, especially when the objects are out of focus (of a lower degree of accessibility).

Mehudar (1996) analyzes the differences between proximate and obviative references in terms of degree of accessibility (see also Arnold, to appear). She corroborates my proposal (Ariel 1990, pp. 76–91) that all languages distinguish between some degrees of accessibility in their referential system, although the distinctions need not be uniform. Thus, in some languages, the proximate is reserved for humans only, in Fox the entity has to be a human with a high social status even. In some languages, the sentence is the relevant unit for determining the choice between the obviative and the proximate (proximates refer intra-sententially, obviatives extra-sententially). Crucially, what remains constant across languages is that the proximate refers to the more highly accessible entity than the obviative, the different researchers referring to it alternatively as the one in the focus of attention, the central focus of the discourse, the focus of consciousness etc.

2.4 Accessibility predictions pertaining to the antecedent-anaphor relationship (unity)

Accessibility theory predicts that higher accessibility markers should be used when the connection between the antecedent (unit) and the anaphor (unit) are tight (and vice versa for a loose connection). Recent work has supported this claim. Halmari (1996) presents data showing how paragraph-initial position

creates a lowering of the accessibility marking for continuing discourse entities. The 90 cases where she found too low accessibility markers were also paragraph-initial. In a psycholinguistic experiment, Fowler et al. (1997) found that episode boundary was crucial for choosing longer anaphoric expressions (of a lower degree of accessibility). Khan (1999, p. 330) finds that in conversational Jewish Neo-Aramaic (of Arbel), the use of the grammatically optional subject pronoun marks the "clause as being separated from the preceding context by some kind of discontinuity or disjunction". It is then relatively more frequent when there is a change of subject or in grounding, when the events are perceived as separate, and at the beginning of speech. I have argued that the way we refer to initial retrieval entities (loose connection to an antecedent) is also crucially dependent on degree of accessibility (Ariel 1996). Even initial retrievals, which are brand new to the discourse, can be more or less accessible. For example, frame-induced entities are highly accessible. They are coded by relatively higher accessibility markers, then. Chafe (1996, pp. 42–46) distinguishes between two types of inferred entities. He mentions in this connection a contrast between a stressed definite description and an unstressed one. The latter was used when the inferred entity was more automatically accessible. Ziv (1996) shows how when the inferred entity is stereotypically accessible (i.e., highly accessible) even pronouns can be used for initial retrievals. Maes and Noordman (1995) find that Dutch definite NPs refer to more remote antecedents than demonstrative NPs, initial retrievals for the most part.

Section 2 has described recent research which supports the main tenets of accessibility theory, namely that referential choice is made by assessing the degree of accessibility of the mental representation retrieved, by considering the salience of the antecedent and the degree of unity between the antecedent and the anaphor.

3. Accessibility theory and the grammar-pragmatics division of labor

3.1 The grammatical status of the accessibility principles

Accessibility theory correlates between specific referring expressions and their usage by reference to a cognitively motivated principle. In this respect, accessibility theory resembles recent attempts to reduce some anaphora phenomena to pragmatic principles, such as Reinhart (1983), Kempson (1984), Levinson (1987, 1991), Huang (1994), Gundel et al. (1993), and Ward et al. (1991). One

could then suggest that accessibility theory should be formulated as a set of extralinguistic inferences, connecting between linguistic forms and proper contexts on the basis of common sense inferences from their semantic meanings, rather than based on conventional form-function correlations (see Reboul 1997; Bach 1998). Such a move would minimize the contribution of accessibility theory to predicting referential form usage. Alternatively, one could maximize the role of accessibility theory, by arguing that the accessibility principles actually replace formal rules. Thus, while I made no attempt to replace the C-command domain by a cognitive concept (although I view it as the grammaticization of a highly accessible context), van Hoek (1995, 1997) uses accessibility theory to reduce C-command to a discourse concept which is sensitive to the prominence of the antecedent and the degree of unity between the antecedent and the anaphor. She thus reformulates Reinhart's C-command restrictions against full NPs being in the C-command domain of pronouns coindexed with them as an accessibility marking violation, where a low accessibility marker is used in a high accessibility context. It remains to be seen whether van Hoek's accessibility restrictions can actually replace the grammatical principle. For example, for the most part, the subject is indeed the most highly accessible entity, discourse-wise as well, which explains why the entities under its domain can be dependent on it for interpretation but not vice versa. However, what if a nondiscourse topic happens to be the grammatical subject (as in 11 below)? Can such a subject, since it is not so salient, be pronominal and coindexed with a full NP in its domain? I doubt that. I therefore see van Hoek's intriguing development of accessibility theory within the sentence (see Ariel 1990, Part II originally) more as testifying to a plausible grammaticization path of accessibility considerations into grammatical rules.

I myself have opted for a nonminimal nonmaximal position (Ariel 1990, 1994). In general, I have argued that the linguistic-extralinguistic division of labor does not neatly divide utterance interpretation according to the topics identified by linguists (see Ariel 1998c, Ms). Such a division would posit that all aspects of reference interpretation belong either in the grammar or in pragmatics. Instead, most probably each and every linguistic form undergoes a dual interpretation procedure, whereby some aspects of its interpretation are linguistically derived, and others are associated with it extra-linguistically (i.e., inferentially). This is certainly the case for referring expressions, where a pragmatic theory (such as Sperber and Wilson's (1986) Relevance theory) has a major role to play (Ariel 1990). Moreover, I have argued that while the form-function correlations established by accessibility theory are cognitively well

motivated for the most part (by the criteria of informativity, rigidity and attenuation mentioned above), some aspects of the accessibility scale (which expressions code which degree of accessibility) need to be grammatically stipulated nonetheless (see Ariel 1990, pp. 76–87). Reference interpretation then is modularized between a linguistic (formal rules and accessibility degree lexically specified) and an extralinguistic inferential competence (see also Farmer and Harnish 1987).²²

This much is perhaps obvious. What is less obvious is that the linguistic-extralinguistic division does not coincide with the sentential-extrasentential division either, nor with the obligatory/optional dichotomy. Garcia (1983) and Ariel (1987, 1990) have emphasized that imposing on grammatical principles a sentential domain misses generalizations that hold both within and across sentences. Aissen (1997) confirms that the same principles account for obviation within and outside the clause. The span within which one third person referent must be proximate and all others obviate can be indefinitely large. The same applies to logophoric markers (marking the character whose point of view is conveyed) (see Hyman and Comrie 1981). In fact, in Plains Cree, the constraint that there must at least be one proximate marker is imposed on a stretch of discourse and **not** on the sentence, which may well not contain any (Comrie 1994). A switch reference system can also involve a relationship between nonadjacent clauses (Comrie 1994). Degree of accessibility, I have argued, is crucial both within and across sentences, and this is why when extremely high accessibility obtains, a zero can be used, whether its antecedent is sentential (e.g., a matrix antecedent in a control context) or extra-sentential (the discourse topic, for the most part). This is why Spanish *si* refers to the subject for the most part (a sentential highly accessible antecedent), but when it does not, it refers to the discourse topic (an extrasentential highly accessible antecedent). I also suggest that the grammarians' division into a grammatical (i.e., obligatory) versus a pragmatic (i.e., optional) "avoid pronoun principle" (for different languages — see Bouchard 1983; Hermon 1985) is unnecessary. Pronoun "avoidance" corresponds straightforwardly to avoiding too low an accessibility marker when the antecedent is extremely highly accessible. Precisely such variability between languages is expected if we assume that cognitive principles apply in all language, but they grammaticize only in some of the cases (see also Comrie 1994).²³

The position I have adopted is that while there is a universal cognitive basis for referential form and usage, specific grammars translate the cognitive generalization somewhat differently (see Levinson 1987, 1991 for a similar point re a

pragmatic universal). There is then a role to the specific grammar of the language in determining referential forms and interpretations (see also Gundel et al. 1993). This division of labor between extragrammatical and grammatical principles explains the differences among languages (Cf. the use of zero subjects in English and Chinese, high accessibility markers in both languages) despite my assumption that mental representations are similarly accessible to speakers of different languages. Since each language only draws a certain number of accessibility distinctions, the choice of actual forms (to have or not to have a definite article, for example) and the precise accessibility domain carved for each referring expression (e.g., what to count as extremely high accessibility licensing a zero in Chinese and in English) may vary. Many languages allow (or dictate) zero for second person references in imperatives (i.e., where the entity referred to is highly accessible), as well as in control verb contexts, where depending on the type of verb, a high cohesion between the clauses creates a high degree of accessibility for the matrix antecedents (as in *I didn't want to see him*, or *Like he wanted me to look at him* — Jury). But these are *grammaticalized* conventions, rather than directly motivated *tendencies*, in that they do not absolutely have to occur in each language. Greek and Sakapulteko Maya, for instance, do not have zero subjects in control contexts, and the latter does not force a zero in imperatives (Du Bois, personal communication). Indeed, accessibility markers even show dialectal variability (see Garcia 1996, and Cameron 1997, on the variability of Spanish referential forms).

Similarly, when we examine the usage of accessibility markers, we can see how formal and cognitive factors work in tandem in conditioning their occurrence. Hyman and Comrie (1981) argue that Gokana logophoric suffixes can always be anaphoric to subjects (a formal condition), but they can be anaphoric to an object, provided it is the source of the information (a pragmatic condition). Aissen (1997) claims that the (obligatory) choice of the argument to be coded as proximate depends on grammatical function, semantic properties and discourse salience (a mixture of formal and pragmatic conditions). In Ariel (1987) I proposed a scale of accessibility contexts, showing that *formally* defined contexts (e.g., where there is an obligatorily and uniquely determined antecedent, as in obligatory control contexts, or in *wh*- extractions) are on a par with *cognitively* defined contexts (e.g., the discourse topic) in that both may require or encourage the use of the same referring expression. Indeed, accessibility markers can be properly used by either fulfilling a formal criterion, or by fulfilling a pragmatic condition. For example, reflexive pronouns in English have an obligatorily formally defined condition: they have to be bound within

their C-command domain. But they can also be used without a sentential antecedent at all, when they are the subject of consciousness. Are these syntactic and pragmatic contexts really different? Note that within the sentence, reflexive pronouns have some contrastive residue. Not so outside the sentence. I suggest that what these uses have in common is an intermediate degree of accessibility. In the minimal (C-command) domain (high accessibility), only a contrastive (relatively low accessibility) entity is of an overall intermediate degree of accessibility. Across the sentence boundary (low accessibility), the subject of consciousness (high accessibility) is also entertained at an overall intermediate degree of accessibility (see Zribi-Hertz 1989 re long distance reflexives). Perhaps we can say that at some deep level these two contexts are cognitively the same. This will allow us to distinguish between potential grammaticizations (where similar degrees of accessibility get coded by the same accessibility marker) versus impossible ones (where different degrees of accessibility get coded by the same referring expression). Note, however, that languages may differ with respect to these two contexts. There may be languages which allow their reflexive pronouns in one but not in the other context. While the degree of accessibility associated with (long) reflexives may be intermediate for all languages, we need to specify for each language what mid accessibility translates into for the specific marker.²⁴

3.2 The grammaticization of accessibility markers

Grammaticization often entails a transition from a pragmatic, extralinguistic tendency to a grammatical, often obligatory rule. In Ariel (1998a, 2000) I have outlined such a historical path of change, leading from free pronouns to verbal person agreement inflections (more attenuated than pronouns, hence marking a higher degree of accessibility), arguing that such a change occurs for the forms referring to highly accessible discourse entities. Since speakers tend to shorten the forms referring to highly accessible entities (the criterion of attenuation), and since the speaker and the addressee (but not 3rd persons) are consistently highly accessible, it would be first/second person pronouns which consistently get shortened (as a pragmatic tendency). Shortening may lead to cliticizations and eventually to obligatory inflection (a grammatical rule). This is why most of the languages which manifest verbal person agreement markers restrict them to 1st and 2nd persons. Person agreement development is a case where accessibility theory directly motivates bona fide *grammatical morphemes* (i.e., person agreement markers which are shortened free pronouns). I believe

that the creation of reflexive pronouns from independent pronouns and independent adjectival *self* in English (see Keenan 1994) can be similarly motivated. Pronouns and modifier *self* were independent forms which consistently co-occurred in Old English in contexts where subject coreference was unexpected. A bare pronoun was then modified by *self* in order to mark the relatively lower degree of accessibility of the subject by a longer referring expression. In fact, the same process can be seen in the current example:

- (9) Frankly, I'm torn *my own self* as to which way to raise hell (Clark Reed, as quoted in *The International Herald Tribune*, Jan 2–3, 1999).

In other cases, accessibility theory can motivate grammatical, even obligatory constraints on the *distribution* of various referring expressions. I have mentioned in this connection the binding conditions (Ariel 1987, 1990; see Keenan 1994; Levinson 1987, 1991). In Ariel (1999), I argue that whereas the distribution of zeroes and resumptive pronouns in relative clauses seems quite diverse among the languages of the world (e.g., some languages make zeroes obligatory with subject relativized positions, some allow or encourage resumptive pronouns only with nonrestrictive relative clauses etc.), accessibility theory can motivate the variability in grammatical patterns we actually find. These stem from frequent discursual patterns which reflect the usage of zeroes and resumptive pronouns according to the degree of accessibility of the antecedent (the relative clause head) when the relativized position is processed. Zeroes are an option, or preferred, or grammaticized for extremely high accessibility contexts, and resumptive pronouns for relatively low accessibility contexts (e.g., syntactic islands). The precise use conditions are language-dependent, of course.

It is important to note that while grammaticizations are often merely the freezing of specific realizations of accessibility distinctions into obligatory linguistic rules (e.g., for gaps and resumptive pronouns in relative clauses), once some rule is part of the language, it may interact with other linguistic facts, and generalizations of patterns may then even obliterate the originally pragmatically motivated distribution (see Comrie 1983, 1988a). This is how I interpret Keenan's (1994) explanation for why English lost its high involvement pronouns (as in *the king walked him to London*). In Old English there were two contexts where anaphors were locally bound to their subjects: nonarguments of the high involvement type and contrastive coarguments of the verb. As I have mentioned before, the latter are less accessible than the former, even though both pick the subject as antecedent. A situation where (locally

bound) *pronouns* are used for high involvement subjects and *reflexive* pronouns are used for (locally bound) contrastive arguments is quite compatible with accessibility theory (see 1.2 above). However, once local binding becomes a characterizing feature of distribution, it is harder (less general) to have two types of referring expressions in the same, by now *grammatically* defined context (local binding with the subject). Perhaps this is why English dropped the “exceptional” use of high involvement pronouns. Hebrew did not. The same explanation applies to the less even spread of reflexive forms to objects of preposition (as in *you making positive choices for yourself in your life* — Death, versus *that’s his way of drawing your attention to him* — Jury — see Bouchard 1985; Faltz 1977; Zribi-Hertz 1980, 1989). For objects of prepositions, especially ungoverned ones, coreference is not so unlikely as for accusatives. Hence, a pronoun could have been acceptable (indeed it was in Old English, and still is in some cases, as in *Do you have any sharp objects on you?* — Risk; Cf. with *they brought it upon themselves* — Cutiepie).²⁵ Note also that whereas genitives are pronominal in many languages, they are reflexive in some (e.g., Swedish and Turkish). Accessibility expectations allow them to be pronouns (due to the high accessibility of their referents), but a formally defined generalization may force a reflexive in this context.

Arnold (to appear) argues that Mapudungun subjects code the most accessible entity of the clause. However, this choice has been frozen into an animacy scale, whereby first/second person references are automatically higher on the scale than third person references. The result is that on the rare occasions when third person referents are more accessible, it is still the first/second persons which are selected for subject position. This is another case where a formal rigid distinction replaces the more variable, cognitive one. Rieder and Mulokandov (1998) find a surprising fact: Hebrew first person plural pronouns (*anaxnu*) contract more often (2.5 times more) than singular first persons (*ani*). ‘We’ is also coded as zero more often than ‘I’ (1.5 times more). These are seemingly unexpected under accessibility theory, since surely the degree with which speakers are accessible to their addressees exceeds the accessibility of the speaker plus another or others (the referents of ‘we’). However, once we take into consideration that Hebrew ‘we’ is three syllables long, the findings are no longer unexplained. Recall that long forms (i.e. least attenuated) code a relatively low degree of accessibility. Since speakers must choose between zero and a three syllable NP for ‘we’ (in modern Hebrew), they would tend to opt for the high accessibility forms more often. Such findings demonstrate the interaction of accessibility theory with specific facts of particular languages, in this case the

lexical options available. Indeed, in Saadi (1997), the number of high accessibility markers (pronouns and zeroes calculated together) was identical for the adult story in Hebrew and English, but Hebrew showed more zeroes than English, and English showed more pronouns than Hebrew. These differences are obviously motivated by the freer zero options available in Hebrew.

The grammaticization of specific anaphoric expressions in certain syntactic structures can also be motivated by accessibility considerations. Ziv (1994) is explicit about it. She argues that one should not simply treat left and right dislocations as whole syntactic constructions used in specific (and different) pragmatic contexts. Rather, she shows that the facts of their pragmatic distribution match the referential forms they employ (an initial NP for left dislocations, an initial pronoun for right dislocations), which, in turn, are governed by the degree of accessibility associated with the entity coded by the dislocated NP. In other words, the frozen referential forms in left and right dislocated sentences are no different from their free occurring counterparts. Montgomery (1989) discusses *it* versus *that* left dislocations. He finds that *that* dislocations occur with the more complex (and clausal) NPs, they establish a contrastive focus in 26% of the cases (as opposed to 7% of the *it* dislocations), and they initiate an "oral paragraph". Note that these are all features which characterize entities of a relatively lower degree of accessibility, and in this respect the findings for *it* and *that* left dislocations are parallel to the ones presented in Linde (1979), Grosz (1981), and Schiffman (1984) for anaphoric *it* and *that* (all quoted in Ariel 1990). Finally, Heller (1998) argues that the Hebrew demonstrative *ze* 'this', when functioning as a copula, forces an extended reference interpretation for the subject. Again, this directly mirrors the referential properties of the intermediate accessibility marker *ze* (see Ariel 1998b).

Giora and Lee (1996) also show that an initially motivated accessibility finding can develop into a (partially) grammaticized fact of a somewhat different functional nature (see also Marslen-Wilson et al. 1982). Giora and Lee argue that while accessibility theory can account for the fact that paragraph-initially, accessibility markers tend to be lower (pronouns instead of zeroes in Chinese), it cannot account for the fact that paragraph-final referring expressions also tend to be lower accessibility markers. It is possible that this distribution is due to the fact that lower accessibility markers are better cataphoric devices. Alternatively, since lower accessibility markers naturally occur paragraph-initially, they may be reanalyzed (also) as discourse segmentation markers. This is what Giora and Lee argue for.²⁶ In a similar vein but more radically, Vonk et al. (1993) argue that overspecified referring expressions (too low

accessibility markers) *affect* discourse structure, rather than merely reflect it, as I originally argued. Lower accessibility markers instruct the addressee to shift from the current global discourse topic, even if the protagonist herself remains the same. In their experiments, the decision to shift to a new unit of information was determined by the choice of a too low accessibility marker, rather than the other way round. I believe that the high correlation between segment-initial position and low accessibility markers is originally motivated by the default strategy of emptying short term memory at the end of segments. However, this correlation may then be used in the other direction, namely to aid addressees in segmenting the discourse, especially when other means (such as time and place shifting expressions — see Gernsbacher 1991) are not available.

In Section 3 I have argued that referential choice and interpretation is partly governed by grammatical principles and partly by extragrammatical accessibility considerations. However, because of grammaticization processes, the grammar-internal/external division of labor is not rigid across languages, nor within languages.

4. Competing theories of reference

Accessibility theory is not the only theory which seeks to anchor referential forms in a broader, less than fully linguistic system. Chafe (1976 and onwards), Givón (1983), Levinson (1987, 1991) (and Huang 1994), Gundel et al. (1993) and Centering theorists (Grosz et al. 1986, 1995) have also offered such theories.²⁷ It is important to note, however, that these theories do not clash with accessibility theory on a few important points: all theories offer some version of a scale on which referring expressions are arranged; all agree that additional, pragmatic factors can override the principles they propose. Crucially, the theories converge on the predictions re gross distinctions between zeroes, pronouns and lexical NPs²⁸; indeed, no counter-examples to accessibility theory have been shown to be better accounted for by these theories. Still, there are conceptual as well as empirical differences between these theories, and I will here briefly mention why I think that accessibility theory provides a better account for referential form use and interpretation.²⁹

Chafe (1976, 1994, 1996) was the first to argue for a direct connection between referential forms and cognitive statuses. In fact, accessibility theory can be seen as an extension of his (and later Givón's 1983) basic insight. Chafe recognizes that activation states are not categorical (discrete), but for language,

he distinguishes between three types of activation states only: activated, semi-active and inactive. Referential forms are chosen according to the estimated cognitive status of the referent: unstressed pronouns retrieve activated referents, and stressed nouns and noun phrases retrieve semiactive and inactive referents. Chafe then has to attribute many distinctions that I attribute to degree of accessibility to other distinctions which are partially orthogonal to degree of activation (identifiability, familiarity, contrastiveness). Although I believe that identifiability and contrastiveness are orthogonal to degree of accessibility, I think that Chafe is attributing distinctions to these concepts that are better treated as accessibility distinctions. For example, one wonders why stressed forms are consistently used for both lower accessibility and contrastiveness in many languages. I have argued (Ariel 1990) that a contrastive form is used for an entity not predicted to occur (in the particular role). Hence the connection between contrastiveness and a relatively lower degree of accessibility. Also, Chafe claims that demonstrative pronouns *identify* better than pronouns (he contrasts *it* with *this*, see also Vonk et al. 1992, p. 303), in order to distinguish between them, since the three-way activation division is not enough for that. It is not clear how *this* identifies anything better than *it* (except by marking a lower degree of accessibility). Although it is widely believed that *this* is more informative than *it* (presumably because of its deictic component), the actual distribution of *it* versus *this* shows that spatial deixis is very marginal in discourse. And *this* does not provide more information about the intended antecedent than *it* (see ex. 1 again). The main problem with Chafe's proposal is that a three-way distinction cannot account for the range of data I have referred to. In fact, Chafe himself presents a counterexample to his own three-way distinction: stressed pronouns which are not contrastive. They are an intermediate category. Finally, Chafe (1996, p. 40) anticipates that more degrees of activation may need to be recognized.

Levinson's basic intuition is that coreference is preferred over noncoreference, and that minimal forms (e.g., zero, pronoun) should be used, unless fuller forms (e.g., lexical NPs) are specifically required (i.e., if the grammar does not allow the use of a minimal form). If, however, a fuller form is found where a more minimal form is licensed by the grammar, the addressee draws an implicature that the speaker did NOT intend a coreference reading (see originally Reinhart 1983). I have argued against Levinson's (1987, 1991) theory at length (see Ariel 1994, 1996, and see also Blackwell, 2000). I have presented many counterexamples to his predictions, most of which stem from his insistence on the (grammarian's) coreference-disjoint reference distinction. Thus,

Levinson can indeed motivate why certain anaphoric expressions are disjoint in reference from certain antecedents (when a low accessibility marker is used instead of a high accessibility marker). But he cannot explain why the same low accessibility markers must be interpreted as coreferent with other antecedents, which are undistinguishable from the “illegitimate” antecedents on his account. I will here mention one example (*His* and the zero refer to the sexual abuser, who is the discourse topic):

- (10) REBECCA: .. put *the newspaper*_i on his lap,
 RICKIE: Y[eah],
 REBECCA: 0 [mas]turbated,
 and then lifted *the paper*_i [up],
 RICKIE: [Yeah],
 REBECCA: .. for her to see (Jury).

Note that grammatically, ‘the newspaper’ could have been referred to by an *it* in the second mention. Cross-sentential pronouns are quite frequent in discourse (in fact, see the use of *his* and *her* in this example). But it was not. Still, no disjoint reading is generated, and we understand the two expressions as coreferent NPs. The reason is, I have argued, that the mental representation of ‘the newspaper’ is not highly accessible enough to merit a pronoun, but that does not at all rule out a coreference reading. Levinson seems to equate between high accessibility marking and coreference and between low accessibility marking and disjointness. I have argued that (non) coreference and degree of accessibility are orthogonal to each other. Another insensitivity of Levinson’s (and others) is manifest in this example, namely the lack of attention paid to the difference between types of full NPs, here *the newspaper* and *the paper*. The latter is a shorter referring expression, therefore marking a higher degree of accessibility. It is a full lexical NP on Levinson’s account, therefore undistinguishable from the longer alternative. But the shorter low accessibility form is not accidentally used. One of the most important claims of accessibility theory is that accessibility comes in a rich array of degrees, and any attempt to reduce it to a binary (coreference/disjointness) distinction is doomed to fail.

Next, consider Gundel et al. (1993). A superficial look at Gundel et al.’s theory reveals an important advantage over accessibility theory. Whereas accessibility theory claims that degree of accessibility is responsible for the distribution of referring expressions, no attempt is made to specify a one-to-one cognitive correlate for each referring expression beyond the claim that a repre-

sentation is supposed to be relatively more or relatively less accessible given a specific referring expression. No cognitive status is described in the absolute. Gundel et al.'s Givenness hierarchy proposes precisely that. Their theory maps mental representations referred to onto six implicationally related cognitive statuses (each status implies that the statuses to its right hold as well):

- (11) In focus > activated > familiar > uniquely identifiable > referential > type identifiable.

Unfortunately, the list of statuses specified looks suspiciously compatible with the distribution of just those referring expressions linguists have tended to focus on (i.e., some but not even all the referential forms in English + zero). Now, I agree that linguists must absolutely set their goal at explicating linguistic forms, but the result in this case is that the *cognitive* aspect of the explanation is severely compromised. The cognitive basis of referential forms is drastically reduced if cognitive statuses are actually defined as a disjunction of statuses. Consider the status of 'uniquely identifiable'. This status actually comprises two rather different cognitive activities: the addressee is either to retrieve an existing representation for a specific entity, or else to immediately generate such a representation. Now, I am not denying that definite descriptions (most prominently) trigger both of these cognitive processes. But are we really justified in claiming that these two are one and the same cognitively? The status of 'referential' is also a bi-cognitive status according to Gundel et al.'s definition: "the addressee must either retrieve an existing representation of the speaker's intended referent or construct a new representation" (276). In fact, it is hard to see how the characterization of 'referential' differs from that of 'uniquely identifiable'.³⁰ In addition, it is not clear how the first disjunct of 'uniquely identifiable' and of 'referential' differs from the status of 'familiar', i.e., "The addressee is able to uniquely identify the intended referent because he already has a representation of it in memory" (p. 278).

Moreover, it is not only that cognitive statuses are disjunctive, so is the relationship between referring expressions and cognitive statuses. *That*, *this*, *IT* (stressed) and *this N* are all said to mark one and the same 'activated' status in English (Japanese has 6 expressions for this cognitive category); Russian and Spanish have two expressions for the 'familiar' status. These show a many forms-one function relationship. Mulkern (1996), using Gundel et al.'s (1993) theory, finds that partial proper names are either 'familiar' or 'activated', whereas full names are either 'uniquely identifiable' or 'familiar'. These show a

one form-many functions relationship. In other words, there is no one-to-one correspondence between forms and cognitive status in any direction. Another problem with Gundel et al.'s Givenness hierarchy is raised by Ziv (1996): pronouns ('in focus') are predicted to always be 'uniquely identifiable' according to the Givenness hierarchy (because the hierarchy is implicational), but they are definitely not always so. In Ziv's examples they are unidentified inferred role players. This seriously undermines the potential explanatory superiority of the Givenness proposal. Also, while there is psychological evidence for the scalar relationship between 'in focus' and 'activated' (see the references above), there is no psychological evidence for the scalar distinctions between the other four categories on the scale.

Finally, Gundel et al.'s (1993) theory (as well as the other theories here discussed) are far too restricted as to the referring expression types they recognize. The problem of a one-to-one correlation between an absolutely defined cognitive status and each referring expression is aggravated once we take into consideration the actual rich array of expression types. For example, how would one distinguish between zeroes and pronouns in a language which uses both as very high accessibility markers (e.g., English, and even more so, Hebrew)? Both must be classified as 'in focus' markers, but they each have a *distinct* distributional pattern. How can we distinguish between full and cliticized pronouns? Between first/second and third person pronouns, between more and less informative definite descriptions and proper names? Between longer and shorter definite descriptions and names where length does not affect the degree of informativity (Cf. *the newspaper* with *the paper* above)? I doubt that Gundel et al. can offer as many coherently defined cognitive statuses as there are distinguishable referring expression types. The only way they (as well as Levinson, Chafe and Centering theorists — see below) can handle such different distributions is by incorporating additional explanations. Accessibility theory handles most of these distributional patterns by one and the same generalization, although it does not completely replace identifiability and contrastiveness.

Centering theory has focussed on an important factor in referential form choice: text coherence and its effect on the prominence of potential antecedents. Centering theorists (Grosz, Joshi & Weinstein 1986, 1995; Walker, Iida & Cote 1990) distinguish between antecedents as to their likelihood of becoming the focus of the next clause: topics, entities empathized with and subjects are expected to be the next clause topic more than non-topics, non-empathized entities and non-subjects respectively. They themselves are ordered as above with respect to potential future focussing on. Centering theorists then cor-

rectly predict that the more prominent discourse entity will be coded by zero or pronoun (depending on the language). They also emphasize that the salience of a discourse entity is determined by a combination of syntactic, semantic and pragmatic factors. All this is of course quite compatible with accessibility theory.

However, Centering theory cannot be taken as a theory about referring expressions in general. Its proponents cannot even be said to characterize the usage of pronouns really, which they purport to. Their formulation of the 'pronoun rule' (or the zero rule for languages like Japanese) is that if some entity is realized as a pronoun, then so must be the highest ranking entity. This is for the most part the discourse topic, and hence, it will indeed be coded by at least as high an accessibility marker as the less accessible discourse entities.³¹ But note that this formulation is far from a complete picture of anaphora (Centering theory does not even consider referential nonanaphoric cases). How does one decide whether she can refer to the other, less salient antecedent by a pronoun? And how does one decide on referring expressions other than pronouns? Note that Centering theory predictions are not violated if the highly salient discourse topic is coded by a full NP, provided the other, lower-ranking centers are too (or if they are not mentioned). This is a serious problem in view of the discourse findings presented in the literature. In fact, "the repeated name penalty", which has been presented as support for Centering theory is not actually predicted by it, just because the pronoun rule is formulated in such a way that it does not rule out lexical anaphors. What are the predictions for the highest ranking entity if a lower one is coded by a demonstrative pronoun? Probably because their main interest lies in coherence relations between clauses, Centering theorists, do not address these questions. Their rule determines what the coding should be for the one, most prominent discourse entity, and even this is not stated absolutely, but rather, in comparison to other discourse entities. I suggest that what the pronoun rule boils down to is 'use a high accessibility marker for highly accessible entities, subject to what the selection of high accessibility markers is in the language'. Since some languages can distinguish between zero and pronoun and/or between cliticized and full pronouns, the most highly accessible discourse entity may actually be *required* to be coded by a higher accessibility marker than the next one in ranking (a stronger requirement than the Centering one). Further research is required. The following example shows that Centering theorists focus too much on local connections. While in most cases the discourse topic is also the sentence subject of the sentence, in this case it is not. Thus, despite the fact that the higher officer is mentioned as a subject in two

consecutive clauses (not to mention the hair) it is still the discourse topic (officer Feil) which is pronominal and not the higher officer in both instances:

- (12) It is not as if he_i looks like a hippie really, or anything like that. ... Feil's_i grey-brown hair... covers his_i collar from behind. But one day in 93' the officer_j in charge of him_i demanded from him_i to have a haircut... The officer_j accused him_i... (*Haaretz* 1.21.99).

In sum, all the theories discussed in Section 4 correctly predict some of the distributional patterns of referring expressions, but none, I believe, can account for the full range of data as well as accessibility theory.

5. Directions for further research

While anaphora has been extensively researched by both linguists and psycholinguists, many questions are still unresolved. I list below a series of open questions pertaining to referential forms and linguistic and psycholinguistic research. I have divided them into linguistic (5.1) and psycholinguistic (5.2) questions.

5.1 Linguistic proper questions

Kirsner (1979, 1990; Kirsner & Van Heuven 1988) has data which contradicts accessibility theory predictions re proximate and distal demonstratives used anaphorically. Accessibility theory predicts that the demonstrative used for proximate physical pointing will also code a higher degree of accessibility when used anaphorically, as compared with the distal demonstrative. However, in Kirsner's Dutch data, it is the distal one (*die*) which refers to the less distant antecedents (70% of the demonstratives which had an antecedent in the same sentence were distal); It is the proximate demonstrative (*deze*) which refers to the more distant antecedents (89% of the demonstratives referring to an antecedent 2-3 sentences away were proximate). However, other languages pattern as predicted by accessibility theory (see Ariel 1998b; Lichtenberk 1996), and 87% of *deze*'s do find their antecedents in the same or the previous sentence. Perhaps because the proximate demonstrative is originally used for highly accessible entities which are marked in the specific role they occur in, they are reinterpreted as "greater urging that the hearer find the referent" (Kirsner 1979, p. 358), leading to their reclassification as relatively lower

accessibility markers. Further research is needed.³²

Potential complications for accessibility theory are introduced by Arnold (to appear). Arnold first establishes that Mapudungun subjects code the most accessible entity of the clause. This should mean that when the subject is referred to in a subsequent clause, the anaphoric expression used should be a high accessibility marker. This is generally true, but Arnold shows that there is an additional factor at work: parallelism. The probability for an anaphoric object to be nonovert (a high accessibility marker) is higher when the antecedent is an object (i.e. representing an entity of a relatively lower degree of accessibility) than when it is a subject (coding the most highly accessible entity of the previous clause). Arnold attributes this phenomenon to the effect of parallelism. Rosén (1996) discusses a similar phenomenon. Zero subjects are interpreted not necessarily on the basis of the previous clause zero subject, but rather, on the basis of a possibly nonadjacent previous clause where the verb has a similar argument structure. Chambers and Smyth (1998) provide psycholinguistic evidence for the preference for pronouns to be coreferent with antecedents of the same structural status (subjects with subjects, and crucially, objects with objects). It remains to be seen whether parallelism is a separate factor working orthogonally to accessibility theory or whether the findings can be motivated within accessibility theory, by incorporating expected grammatical role as an accessibility factor. Du Bois (1980) had in fact argued that there is a separate tracking mechanism for objects.

Degree of accessibility is a feature that characterizes Given information. It should then be fruitful to re-examine all those forms argued to code Given information (e.g., presuppositions, ergative nominals), and see whether it is general Givenness which determines their proper use or whether it has to be a specific degree of accessibility. For example, Du Bois (1987) found that the rate of new entities is significantly lower than the rate of lexical NPs. This gap is probably explained by the presence of Given discourse entities which are of a relatively low degree of accessibility, and hence, are coded by lexical NPs despite their Givenness. If the motivation he proposes for ergative and accusative markings is based on the *lexical* versus *nonlexical* distinction, then it is probably based on the consistently high degree of accessibility of agents versus the inconsistent degree of accessibility associated with intransitive subjects and objects, rather than on the Given-New distinction between them.³³ The same applies perhaps to the pragmatic principle Du Bois proposes as underlying his "preferred argument structure", namely, "Avoid more than one new argument per clause" (p. 826). It should perhaps be replaced by "Avoid more than one

argument of a low degree of accessibility". Assuming that this is true, it remains to be seen what counts as a too low a degree of accessibility.³⁴

Gernsbacher (1989) demonstrates how different referring expressions enhance the accessibility of the mental representations associated with them. More explicit expressions (lower accessibility markers, proper names, for example) boost the activation of their mental representations faster and more than higher accessibility markers (pronouns, for example, see also Clifton & Ferreira 1987). In effect, the same accessibility marking scale reflects accessibility enhancing (and suppressing): the lower the accessibility marker used, the more enhanced the discourse entity coded by it will become (and the more suppressed other discourse entities will become). This means that the same accessibility markers code a specific *current* degree of accessibility (say, low), but at the same time, they contribute (at least partly) to the opposite degree of *future* accessibility (high). This can explain why speakers shift to lower accessibility markers from time to time, even when they continue to discuss the same discourse entity.

These shifts combined with results obtained by Sanford and Garrod (1981) and Almor (1999), point to conflicting motivations in referential expression choice: "Live for today" versus "Live for tomorrow". Sanford and Garrod's results show that using too low an accessibility marker (e.g., a definite NP when the antecedent is a repeated discourse topic) slows subjects down. Gernsbacher's results, on the other hand, show that lower accessibility markers boost future degree of accessibility. In other words, in some cases the speaker has to choose whether she wishes to attend to her addressee's needs by choosing her accessibility marker in accordance with the current degree of accessibility (e.g., high), or by "ensuring the future", that the entity at hand remains/regains a high degree of accessibility (by choosing an accessibility marker which is relatively too low). Such competing motivations are rampant in natural language (see Du Bois 1985), and further research is called for in order to find out when it is that speakers opt for reflecting current degree of accessibility and when they opt for establishing or maintaining a high degree of accessibility for future references.

An interesting open question that needs researching into is the question of the correlation between referentiality and degree of accessibility. It seems that some forms are not only very high accessibility markers (e.g., zeroes), they are also more compatible with nonreferential readings (see Cameron 1997; Doron 1982; Garcia 1996; Sells 1984). However, as antecedents, nonreferential entities (e.g., 'whoever', generic NPs, impersonal 'you') are on the whole less accessible, and hence should have prompted relatively lower accessibility anaphoric

expressions. I have argued against a referential/nonreferential marking dichotomy, showing that even nonreferential arguments in relative clauses are not restricted to gaps and may take resumptive pronouns (Ariel 1990, pp. 153–155). But the fact remains that the preference for gaps is stronger when relative clause heads are nonreferential, despite the relative low accessibility of nonreferential antecedents. Perhaps this is related to the future accessibility marking of NPs. Nonreferentials are typically noncataphoric, hence the avoidance of low accessibility markers.³⁵

Grammaticalization raises interesting questions too, not limited to referring expressions. How do we determine that a certain interpretative process is grammaticized, as opposed to being merely a common-sensical choice? (see also Kirsner & Van Heuven 1988). McDonald and MacWhinney (1995) show that when there is a clash between a 1st mention antecedent and an antecedent compatible with the semantics of the verb, the latter wins out. Is this a grammatical fact or only an extragrammatical strategy (because violating the latter would cause incoherence)? When do we say that a discourse pattern has become grammaticized? Is a certain statistical percentage sufficient? Do we require 100%? If we do, we will hardly be able to establish any obligatory grammatical rules. But then, if we do not impose such a high requirement, it is hard to tell the difference between the discourse profile of some form and the linguistic convention dictating its distribution (see also Ariel 1999). For example, most of the antecedents of Spanish *si* are subjects. In this case, Garcia (1983) argues against this being a grammatical rule. Instead, *si* is taken to demand highly accessible antecedents. But Garcia herself (as all functionalists, in fact) is not committed to “all or nothing” principles. Rather, she presents her theory as a set of principles generating discursual preferences. These by definition are not 100% correlations. The question then arises as to when we decide that a certain high percentage represents a formal rule and when we posit an extralinguistic generalization, which, as Garcia says, may not show a 100% correlation either. Perhaps we should after all impose a requirement for (a near) 100% correlation for grammatical principles, provided we recognize their complexity (see 1.2 above), as well as the fact that sometimes competing factors may block full compliance with the generalization.

Dahl and Fraurud (1996) and Fraurud (1996) argue that we need to recognize the importance of animacy in referential choice. In their Swedish data, pronouns retrieved some human but no nonhuman antecedents which were not in the immediately preceding sentence. All the nonhuman referents coded by pronouns had a nearby antecedent. In general, whereas over a third of

the human definite 3rd person NPs were coded by pronouns, only 8% of the nonhuman NPs were coded by pronouns. Now, is this a discourse profile, or a grammatical convention? Should we say that pronouns cannot refer to nonhuman antecedents which do not occur in the same or the previous sentence? It seems that this is true in 100% of the cases, after all. I would rather not impose such a grammatical rule in this case. Fraurud's findings can be seen as reflecting the discourse profile of pronouns with nonhuman antecedents: Nonhuman entities are not as salient to us as humans are. If so, we should only expect to find that nonhumans in the same (large) distance as human antecedents are of a lower degree of accessibility. Hence the inability of pronouns to refer to them. In order to distinguish between these two options one should examine cases where nonhumans are very salient, as when they are the continuing discourse topic. If they cannot be referred to by nonimmediate pronouns even in such cases, then Fraurud's findings should be incorporated as a grammatical (semi-arbitrary) convention.

5.2 Questions pertaining to the connection between psycholinguistic research and grammar

The cognitive psychologists' findings so far seem to me to corroborate all existing theories, although they are presented as supporting either Centering theories (e.g., Gordon & Chan 1995; Kennison & Gordon 1997), Givón's (1983) topic continuity theory (Gernsbacher & Jescheniak, Ms.; Gernsbacher & Shroyer 1989) or accessibility theory (Almor 1999, in press; Arnold 1997). The reason is that the psycholinguistic findings support any theory which posits some scale of referential forms (Gundel et al. 1993 included). It would be interesting to think of psycholinguistic experiments which would test the different predictions of these different theories in order to establish whether one is possibly superior to others.³⁶

Recall that Almor (1999) argues very forcefully that when low accessibility markers are justifiably used in high accessibility contexts, processing is not slowed down. This finding contradicts my claim that proper accessibility marking can and is violated for special effects at a processing cost. It is not clear to me that Almor has actually proved that this is not the case. In order to do that, he would have to compare contextually informative low accessibility markers with pronouns when the antecedent is in focus. The comparisons he presents only compare justified versus unjustified low accessibility markers, but not high accessibility markers. I expect pronouns to take less time than

informative low accessibility markers. I would then view his current findings as showing that unjustified low accessibility markers merely slow addressees down *more* than justified low accessibility markers do, and not that justified low accessibility markers do not absolutely slow processing down.

Gernsbacher and Faust (1991) explain the problem of less skilled comprehenders by reference to their less efficient suppression mechanism. Their experiments concern ambiguous words, where they find that the less skilled comprehenders have no problem making use of contextual cues for the appropriate interpretation. They also have no problem enhancing contextually appropriate information, but they find it relatively difficult to reject contextually inappropriate meanings that were generated automatically. Two questions come to mind. If suppression mechanisms are crucial for reference interpretation, then these same comprehenders are expected to also have problems in interpreting referring expressions where reliance on suppression is required (i.e., when there are competing antecedents). A more radical research goal is to look into the possibility that comprehenders may have different suppression and enhancement problems in different tasks, specifically, in reference determination versus ambiguity resolution. Gernsbacher assumes that enhancement and suppression are general cognitive skills, and indeed shows that the same less skilled comprehenders have difficulties suppressing non-verbal stimuli. Still, we should ascertain that this generalization holds across different linguistic interpretative processes as well.

Psychologists have worried in the past about the ecological validity of their laboratory experiments, namely about the applicability of their experimental findings to the natural activities of their subjects. This problem still exists, of course, but I would like to point to a related problem. Suppose we grant that the discourses recently tested in many psycholinguistic experiments are real enough. Based on the psycholinguistic findings, we could easily establish a very rich scale of degrees of mental accessibility for concepts in various contexts. An important research goal then awaits linguists in trying to understand which of these psychologically real distinctions translates into a possible grammatical distinction (i.e., one that occurs at least in some language). Is it just the frequency of the cases in which the accessibility-related processing distinction is crucial for communicative purposes that determines that a linguistic distinction is to be instituted? If so, can we prove that this is the case? Alternatively, it could be that what is universal is not that specific "fundamental" (essential) accessibility distinctions are to be drawn by each grammar, but rather, that *some* accessibility distinctions be drawn. In other words, perhaps it is not so

important what precise contexts are to be declared as bearing a distinct (high/low/intermediate, etc.) degree of accessibility so much, as it is crucial that each language should have at least a minimal number of linguistically marked accessibility distinctions, which it then maps on to various contexts in a motivated yet somewhat language-dependent way. The universal could also be some combination between these two alternatives, namely, that some specific essential distinctions are "obligatory", and others have to occur, but with no restrictions as to where they are drawn. Some processing distinctions may simply be uncodable by (semi-)formal rules, and thus can only constitute laboratory results. Some distinctions may be mutually exclusive (obviation and logophoricity perhaps), because they are too similar.

For example, Gernsbacher (1989) finds that when pronouns are relatively quite informative (when the gender distinction can distinguish between the intended antecedent and an unintended one), they suppress other discourse entities more than when they are not as informative (because the competing antecedents are of the same gender, see also MacDonald & MacWhinney 1990). No grammaticized consequence is expected in this case, however, since languages do not usually offer a choice between gender-marked versus gender unmarked pronouns; they have one or the other option. Similarly, Gernsbacher et al. (1989) find that first mentions in conjoined (new) NPs are later more highly accessible than second mention NPs. Non subject initial participants are also more accessible (Gernsbacher 1991). Yet, no language is known to have grammaticized the notion of clausal first mentions. It is usually the subject that serves as a locus of grammatical conventions, e.g., the restriction of reflexives in some languages to subject antecedents. No language, to the best of my knowledge, restricts reflexives to clausal first mentions, even though many languages allow nonsubjects in sentence initial position quite freely. It is still possible, of course, that a clausal first mention discursal preference will be found, regardless of grammatical role. Karmiloff-Smith (1985) points out that children tend to refer to main characters by pronouns, and to marginal characters by lexical NPs. While this would be a well-motivated grammaticization path, since main characters are consistently more salient than marginal ones, I do not expect it to be an adult grammaticization path: We need to refer to main characters by lower accessibility markers sometimes (e.g. following episode boundaries) and we need to refer to temporarily highly accessible marginal characters by high accessibility markers.³⁷

Gernsbacher's (1989) findings raise an interesting question pertaining to the nonautomatic connection between psycholinguistic and linguistic facts.

Gernsbacher's subjects first read a sentence which introduced two characters. They were then presented with a participial phrase which biased them towards one of the two potential antecedents, followed by a pronoun. Reaction time measurements revealed no difference in the accessibility of the two antecedents at the stage where the pronoun was encountered, despite the biasing adverbial. At the end of the clause, however, the degree of accessibility associated with the appropriate antecedent was higher.³⁸ Such findings raise a question about the processing stage relevant for measuring degree of accessibility. If accessibility theory is correct, we should expect that the relevant time is the stage at which the anaphor is processed (whenever that may be). However, it is not clear that grammaticizations can be sensitive to fine-tuned accessibility fluctuations over very short spans of time, so perhaps we must not expect a perfect fit between degree of accessibility as measured by psycholinguistic experiments and degree of accessibility as it is reflected in linguistic conventions. Further research is needed to settle this question.

Last, some linguistic and psycholinguistic results that we have are actually in conflict with each other. Thus, Clark and Sengul (1979) compare the retrieval of antecedents in previous clauses of the same sentence versus across sentence boundary. Based on subjects' reaction times, they conclude that it is the clause rather than the sentence that makes the significant difference in the processing time of anaphors. However, Clancy (1980), examining English and Japanese narratives, finds that it is the sentence rather than the clause that better accounts for the distribution of fuller versus attenuated referential forms. We need to find out whether there is one relevant unit (either the clause or the sentence), or whether under different conditions, or for different forms, one of them may be the more relevant unit (a more plausible possibility).³⁹

In this article I have tried to describe the main claims and findings of accessibility theory, emphasizing that the notion of accessibility is complex and that it is by no means the only factor determining referential form. I corroborated the accessibility claims relying on more recent research which also further develops the theory. I have argued that accessibility theory is at least partly linguistic, despite the fact that it is well motivated cognitively, and that it accounts for the rich data better than other theories of discourse reference. Finally, I have raised several open questions regarding discourse references. I hope linguists and psycholinguists will be prompted to explore them.

Notes

1. Accessibility theory is very much in tune with many recent psycholinguistic proposals, where mental accessibility of various referents has been experimented with. In fact, these experiments (together with discourse data) form the empirical basis of accessibility theory. However, psycholinguists and linguists approach the accessibility of mental representations with different goals in mind. Whereas the psycholinguists are interested in learning about human memory, the linguists are interested in learning about natural language expressions. Hence, the psycholinguists use pronouns in order to draw conclusions about working memory, and *any* definite lexical NPs (definite descriptions and first names) to learn about the reinstatement process from memory. In contrast, the linguist must establish a form-function correlation for each referring expression type. The psycholinguists see anaphora in general as a coherence device, and do not pay careful attention to minute differences between different anaphoric devices. They ignore nonanaphoric referential uses. In addition, psycholinguists are interested in *how* the processing of anaphora is performed, in how speakers assess the degree of accessibility of mental representations to their addressees (Morton Ann Gernsbacher, personal communication). They want to define processing cues, which are different from linguistic codes (see Garnham, Oakhill & Cruttenden 1992; Garrod, Freudenthal & Boyle 1994; MacDonald & MacWhinney 1990; McDonald & MacWhinney 1995; Rinck & Bower 1995, inter alia), and to find *when* the accessing is performed, (e.g. Cacciari, Carreiras & Cionini 1997; Garnham, Traxler, Oakhill & Gernsbacher 1996; Lucas, Tanenhaus & Carlson 1990; MacDonald & MacWhinney 1995). All of these are not of direct interest to the linguist. Last, many psycholinguists are committed to a dichotomy between working and long term memory, and therefore invariably compare two accessibility contexts or two referring expressions at a time. I find that unacceptable from a linguist's point of view, since the impression created is that language poses a binary decision, parallel to the short-long term memory division, where in reality, referring expression must be selected from a large variety of referring expressions.

2. Zeroes are empty argument slots, as in '0 [=you] wanna go?'

3. I thank Jack Du Bois (personal communication) for providing me with this example. All the examples in this text are taken from Du Bois (2000), unless otherwise specified.

4. See Schilperoord (1996) for an argument that degree of accessibility (resulting from the hierarchical structure of the text) determines pause lengths.

5. Note that definite descriptions count as quite low accessibility markers here. Other researchers, however, have sometimes had to say that definite descriptions refer to the most "salient" or contextually uniquely identified referents (e.g. Chafe 1994, 1996; McCawley 1979), in order to make sure that addressees interpret the expression as referring to the immediately *relevant* entity. See Walker and Prince (1996, ex 1) where *the guy* is preferentially understood to refer to the *non-topic* 'guy', rather than to the topical 'guy', and ex. 13, where in a discourse about two sisters, *her sister* changes its reference to whoever is *not* the sister in focus.

6. Cliticized pronouns are shortened pronouns, e.g., 'ya'.

7. Note the following example (Jury), where the molester is first referred to as *he*, then, strictly speaking, he is not referred to for a few intonation units I marked with *. Still, he is later referred to again with a pronoun:

- RICKIE: You know like,
(H) but *he* was making,
* I don't know how you describe it,
* you know how you can be like a nuisance to someone?
*REBECCA: [Mhm].
*RICKIE: [Or] .. you may smell or some[thi]ng,
*REBECCA: [Yeah].
*RICKIE: you know like that you [know,
*REBECCA: [Yeah].
*RICKIE: or] moving around,
* you know like,
... as *he* wanted her to move.

Indeed, Mauener, Tanenhaus, and Carlson (1995) found that missing agents in agentless passive sentences *were* processed nonetheless.

8. Independently, Terken and Nooteboom (1988) found that one previous mention was not sufficient for subjects to treat an entity as Given. In fact, Maes and Noordman (1995) also argue for special functions of these second mentions (see below).

9. In addition, in order to reduce all distinctions to one binary distinction, Givón simply ignores many referential devices, e.g., names (and first, last and full names each code a different degree of accessibility), and agreement markers. He also lumps together referential forms which have different distributional patterns, e.g., zero and pronoun.

10. Nurit Assayag (personal communication) brought to my attention the following example (from her originally Hebrew conversational data), where the speaker refers to herself by too low an accessibility marker (a full pronoun rather than zero in the second mention) in order to maintain a syntactic parallelism with the preceding clause:

So I began and nobody said anything. So *I* continued and nobody said anything.

11. But note that Bird-David's research is on naming rather than on referential forms per se. This is true for all the anthropological work on names.

12. However, Givón's examination of another novel which alternates between the perspectives of the two main characters (*Cold mountain*) revealed a different pattern: The zero/pronoun versus NP distribution for references to the two characters is either similar, or else, there are more full NPs for the other than for the self. At first blush, these findings seem contradictory, but actually, once the author relinquishes the narrator's role to some character, that character's consciousness is at work. Of course, normally, that entails the centrality of the self (Givón's novel), but at other times, the other is so central to the self that the other merits a higher rate of high accessibility markers (*Cold mountain*). This last point deserves further checking.

13. This finding contradicts Bernstein's (1970) conviction that speakers of lower classes

only use the restricted code.

14. Note, however, that first mentions are more highly accessible only when all other factors are equal. When a non-first mention is marked as focus, as in *wh*-clefts, it is the second mention entity, coded by the focussed NP that is more highly accessible (see Almor 1999).

15. In fact, I have already briefly argued that the accessibility markers used to access inferred entities manifest accessibility differences (Ariel 1990, pp. 184–190).

16. See Van den Broek (1990) for the importance of predictive inferences in general.

17. We can similarly establish that some NPs are marked for low or no cataphoricity. Quantified NPs, for example, are known to serve as antecedents for intra-sentential anaphora, but not for extra-sentential anaphora.

18. But first, note that referring expressions are not only measurable along one dimension. Thus, as Downing points out, classifiers also exempt speakers from marking the social status of the (human) referent. Also, as Kirsner (1990) argues, while the Dutch definite article and the distal demonstrative are sometimes interchangeable, the latter are used when the entity referred to has been distinguished from others, while the demonstratives (both the distal and the proximate) are used when the speaker needs to alert the addressee to seek out the referent. Similarly, Epstein (1998a) argues that *the* has additional functions to reference establishing, e.g., marking the referent as prominent. Second, expressions commonly used to refer are not always used referentially, and as such are also otherwise classified (most notably, definite descriptions, which are sometimes used attributively or generically — see Mueller-Lust & Gibbs 1991).

19. But although Cacciari et al. (1997) found that gendered anaphoric expressions speeded up interpretations even when there was no competition over antecedenthood, Garnham et al. 1992 suggest that the gender cue is not always used by subjects.

20. However, we need to also examine the informativity and length of the lexical NPs involved.

21. In fact, C. L. Baker (personal communication) agreed with me on this point.

22. I completely reject Reboul's (1997) assumption of an 'all or none' grammatical/extra-grammatical status for reference interpretation. The fact that *some* aspects of referentiality are better accounted for by a pragmatic theory does not mean that *all* must be accounted for by pragmatic principles.

23. I actually believe that the 'avoid pronoun' principle is superfluous (see Ariel 1990, pp. 100–105). In this case, then, I suggest to replace a grammatical principle with a functional principle.

24. One should however remember to distinguish between long and short reflexives. Accessibility theory predicts that they would be used differently, and indeed they are (see Reinhart & Reuland 1993).

25. I thank Jack Du Bois for giving me the PP reflexive examples.

26. See Mithun (1996, p. 231) for a similar finding.

27. Reboul (1997) argues against accessibility theory, but in effect against all attempts to offer a linguistic theory for extrasentential referential forms. Although she herself does not

propose a specific account, she believes that with Relevance theory (Sperber & Wilson 1986) "one can account for the use of referring expressions, if one considers the *semantic content* of such expressions and the relationship between their semantic content and their referring ability" (p. 91, emphasis added). I had in fact argued against the first part of such a proposal in Ariel (1990, p. 83–86). I have shown that many referring expressions do not differ with respect to their semantic content, but they signal a different degree of accessibility nonetheless (e.g., *it/that*; name/shortened name; full pronouns/reduced pronouns/verbal person agreement markers). Degree of accessibility could be seen as the relationship between the semantics of the expression and referring ability, but it is not a transparently inferred relationship. Differences between languages which have the same referential forms (e.g., English, Hebrew and Chinese all have pronouns and zeroes, but they use them quite differently) are also left unaccounted for under an exclusively pragmatic theory.

28. In fact, Tao (1996) is the only one who claims to have different findings, where zero (in Chinese) is used to shift, rather than to maintain reference.

29. The theories also differ in scope of application. Only Levinson has argued that his principles actually replace the binding rules (and see also Garcia, 1996).

30. Gundel et al. (1993) claim that unlike 'referentials', 'uniquely identifiable' are identified based on the referring expression alone without reference to the rest of the sentence. I doubt that context is ever ignored. In any case, it is hard to know how one could check whether or not sentential (or other) context was actually used in the interpretative process.

31. In fact, Chambers and Smyth (1998) point out that Centering theory also cannot account for the acceptability of examples such as: *Josh criticized Paul and then Marie insulted him*, where the pronoun does not refer to the most prominent forward looking center, nor is it the subject (and topic?) of either clauses. For other arguments against centering theory, see Chambers and Smyth (1998).

32. Kirsner argues that *deze* (+NP) codes HIGH DEIXIS, which often translates to relative low accessibility (in terms of referential distance and antecedent complexity). Note, however, that Kirsner's own attempt to incorporate the higher effort required in HIGH DEIXIS with references to entities physically near, rather than far from the speakers is unconvincing. Also, if important entities require HIGH DEIXIS, does that mean that pronouns coding continuing discourse topics are HIGH DEIXIS too? In other words, Dutch poses a puzzle as to why its proximate demonstrative marks higher accessibility for physical pointings but lower accessibility for discursal references, when compared with the distal demonstrative (but see Piweck et al., as cited in Beun & Cremers 1998, for a different claim re the deictic usage of the proximate and distal demonstratives in Dutch). I tentatively suggest that this has to do with the markedness of the proximate demonstrative (by far the rarer form in spoken Dutch). Thus, there is a potential conflict between demonstratives (in general) and definite descriptions. In terms of accessibility coding, the demonstrative should be the shorter form, but in terms of frequency it is the definite (or the distal demonstrative) which is predicted to be the shorter form. However, once length is established via markedness (i.e., demonstratives are longer than definites) this formal difference in attenuation may affect the degree of accessibility later attributed to them.

33. If we replace Givenness with degree of accessibility, we can perhaps also explain why proper names pattern with 3rd persons in split ergative systems (both are not extremely highly accessible), rather than with 1st/2nd persons, even though they are (almost) equally Given (see Dixon 1979, p. 87).
34. In fact, Du Bois (to appear) proposes that the deeper generalization behind the distribution of agents versus intransitive subjects and objects is sensitive to low versus high processing costs. It is the highly demanding NPs which are restricted in distribution. Indeed, other things being equal, high accessibility marking entails a low processing cost because the entity is highly accessible, and low accessibility marking entails a high processing cost because the entity is not so easily retrievable. However, pragmatically motivated exceptions to accessibility theory do occur, where highly accessible entities are referred to by relatively low accessibility markers (e.g., epithets), or vice versa (less common), where entities of a relatively low degree of accessibility are referred to by high accessibility markers. Accessibility theory predicts that both cases entail a high cost of processing, and hence, they should pattern as high processing cost entities, rather than according to either their marking or their real cognitive accessibility. This hypothesis requires testing. I thank Jack Du Bois for discussing this point with me.
35. It is also possible that using high accessibility markers (usually zeroes or pronouns) promotes the dependence of the interpretation based on another linguistic marker, which is required for nonreferentials.
36. As Morton Ann Gernsbacher (personal communication) reminds me, a huge task still remains of finding psycholinguistic lab evidence for the *continuum* of accessibility.
37. In fact, the children tested initially referred to the protagonists with indefinite NPs (and not pronouns), and they did from time to time refer to secondary characters by pronouns. Unfortunately, Karmiloff-Smith does not provide actual numbers. Also, the opportunity to refer to secondary characters by pronouns was quite limited, since they were mentioned twice at most.
38. Unlike McDonald and MacWhinney (1995), Garnham et al. (1996) too find that relevant semantic information takes effect only at the integration stage. Cacciari et al. (1997) suggest that the different findings re when semantic information is used in reference tracking may actually point to differences between different languages.
39. The psycholinguists also have contradicting results sometimes, e.g., Garrod and Sanford (1982) versus Albrecht and Clifton (1998) re anaphoric references to a conjoined NP antecedent when the anaphor is a subject.

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