Discourse, grammar, discourse

Mira Ariel

Discourse Studies 2009 11: 5
DOI: 10.1177/1461445608098496

Discourse, grammar, discourse

Discourse Studies

SAGE Publications
(Los Angeles, London, New Delhi,
Singapore and Washington DC)
www.sagepublications.com
Vol 11(1): 5–36
10.1177/1461445608098496

MIRA ARIEL
TEL AVIV UNIVERSITY, ISRAEL

ABSTRACT Discourse and grammar often complement each other, each imposing a different set of constraints on speakers' utterances. Discourse constraints are global, pertaining to text coherence, and/or to interpersonal relations. Grammatical constraints are local, pertaining to possible versus impossible structures (within specific languages). Yet, the two must meet in natural discourse. At every point during interaction speakers must simultaneously satisfy both types of constraints in order to communicate properly. It is also during conversational interaction that language change somehow takes place. This overview first explains and exemplifies how discourse constraints guide addressees in selecting specific grammatical forms at different points in the interaction (discourse 'selecting' from grammar). It then examines the relationship between discourse and grammar from a grammaticization point of view, demonstrating how a subset of discourse patterns (may) turn grammatical (grammar 'selecting' from discourse). The central theme is then that discourse depends on grammar, which in turn depends on discourse.

KEY WORDS: *accessibility, arbitrariness, discourse, frequency, grammar, grammaticization*

Discourse and grammar often seem to be two very different facets of human communication. Grammar specifies a set of language-specific codes, typically restricted to sentence-level units. It guides speakers on how to properly construct sentences, which are then joined together by a completely different set of (discourse) principles into a coherent piece of discourse. Discourse is the product of the use of grammar in particular natural contexts. It typically comprises a stretch of utterances (mostly sentences) which are organized in a non-random fashion. The principles informing discourse construction (such as relevance) are global and not specifically linguistic (Giora, 1985; Grice, 1989; Mann and

Thompson, 1988; Sperber and Wilson, 1986/1995; Van Dijk, 1977). It would seem that discourse simply picks up where grammar leaves off, and if so, grammar and discourse complement each other, and there's no interesting relationship between them. The thrust of this overview of the grammar/discourse relationship is that discourse and grammar are very much part of one system of linguistic behavior, and just like horse and carriage, they definitely go together. 'Usage feeds into the creation of grammar just as much as grammar determines the shape of usage' (Bybee, 2006: 730). Discourse cannot but reflect grammar: it contains only, or virtually only, grammatical language products. At the same time, discourse makes a selective use of grammar, choosing just those grammatical forms which suit the specific discourse goals of the speaker. Grammar too reflects discourse: 'Grammar codes (best) what speakers do most [in discourse]' (Du Bois, 1987). It also makes a selective use of discourse, 'choosing' some but not other discourse patterns for grammaticization. In other words, the claim is that there's constant feedback between grammar and discourse, each of them simultaneously taking the active role of the horse, as well as the passive role of the carriage.[1]

Most of this overview is devoted to the relationship between grammar and discourse taken as two sets of different, though interacting linguistic behaviors. Section 2 supports the idea that the linguistic patterns we find in natural discourse reflect a highly selective use of grammar, and section 3 supports the idea that grammaticization, the process which leads to the creation of grammar, turns a select subset of discourse patterns into a (future) grammar. In view of these findings, we raise the question of the arbitrariness of grammar (section 4). But we start off with a few examples demonstrating that grammar is not necessarily restricted to the sentence level, and discourse principles are not necessarily restricted to stretches larger than the sentence (section 1). In other words, some regularities cross-cut the sentence/discourse divide.

1. What's good for the discourse is good for the grammar (and vice versa)

The point of section 1 is that grammatical and discoursal constraints are not always separately satisfied. 'But', as a sentential connective, I argue below, exhibits discoursal behavior, and discourse ellipsis exhibits grammatical behavior (additional examples can be found in Ariel, forthcoming, especially in 3.2.1). The idea is that grammar may cross the sentence boundary, and discoursal relations may be relevant within the sentence.

Antithesis relations present some text portion (the antithesis) as incompatible with another text portion (the thesis). Although most discourse coherence relations are inferred, antithesis relations tend to be overtly marked, often with a 'but' conjunction (Mann and Thompson, 1988). In addition to the incompatibility between the two propositions, the speaker also indicates that she endorses just one of them, the thesis, which is the one following 'but'. Let's start with a sentential example:

1. LYNNE: it d- it sounds easy,
.. **but** it's really hard to do (SBC: 033).[2]

This example fits the bill perfectly. *It sounds easy* (the antithesis) and *it's really hard to do* (the thesis) are clearly incompatible with each other. In addition, Lynne only endorses the thesis in the second conjunct (that's her main point). Sentential antithesis relations seem quite straightforward, then. Now, when we examine discoursal *but*s the interpretative procedure seems much more complicated. Nevertheless, as we shall see, the same antithesis relations that obtain between two conjuncts of one and the same sentence (as in 1) apply to two independent discourse portions. In fact, extra-sentential complications plague sentential *but* cases too.

First, consider (2), where the antithesis has to be reconstructed from two separate turns of Miles, as well as from Harold's turn (all are marked bold):

2. $MILES_1$: I mean **that** looks kinda like a Black person.
$HAROLD_1$: **With red eyes,**
and everything?
$MILES_2$: So where is this from.
... **This isn't from Africa**,
is it?
$HAROLD_2$: .. **No.**
... From Indonesia.
$MILES_3$: ... **But** that person looks Black (SBC: 002).

Whereas *easy* and *hard* in (1) are semantic antonyms, and hence incompatible with each other, $Miles_3$' thesis, *that person looks black*, must here be contrasted with a reconstructed antithesis, something like: 'I'm looking at some person which you too can identify ($Miles_1$, $Harold_1$) who is not from Africa, but from Indonesia ($Miles_2$, $Harold_2$)'. In fact, not just the antithesis needs to be inferred, also the incompatibility between the two propositions requires some inferred steps. After all, why can't an Indonesian look black? Since *but* forces us to construct the two propositions as incompatible, we need to take the antithesis as supporting the conclusion that the person cannot be black, presumably because only Africans are black (based on $Miles_2$). Only at this point can we deduce the incompatibility between the antithesis and the thesis. Discoursal interpretations seem far from the automatic decoding interpretations associated with grammar.

But actually, when we look back at (1), it too is more complicated than we presented it to be. Note that the fact that something sounds easy does not rule out the possibility that it is hard. In fact, in some contexts, speakers may use this sentence to implicate that it IS hard. Here too we need an auxiliary inference in order to view the sentence as acceptable. Specifically, we need to infer that if something sounds easy, then it may very well be easy. Only then is there an incompatibility between the two conjuncts. And note the following, where both the thesis and the antithesis need to be enriched by some inference in order to constitute incompatible propositions:

3. ALINA: So he got another radi[o this] summer,
LENORE: [(H)=]
ALINA: **but** of course that got ripped off also (SBC: 006).

Although this is a sentential *but*, we need to exercise quite a bit of inferencing to process the *but* utterance. We need to view the antithesis ('he got another radio') as supporting an implicit conclusion, that 'he has a radio now', and we need to view the thesis ('the radio got ripped off') as supporting the opposite implicit conclusion, namely, that 'he does not have a radio now'. In other words, there's a lot of discoursal (contextual, inferential) work involved in interpreting a sentential *but* example such as (3). If so, both the marking (by *but*) and the interpretative processes involved are the same for sentential and for cross-sentential *but* cases. What's true of the discourse is true of the sentence.

Next, just like discoursal procedures operate within the sentence, so too grammatical procedures operate across sentences and even speakers (see also Van Dijk, 1972). Ellipsis is traditionally considered a grammatical phenomenon because there seem to be precise grammatical conventions as to how to recover the missing material. 4(a) exemplifies an intra-sentential case of ellipsis, and (b) is an inter-sentential case. I indicate in double parentheses the recovered material for each:

4. a. I think it poured it in there but I can't tell ((**that it poured it in there**)) (LSAC).

4. b. ROY: .. Figure that one out.
MARILYN: ... <VOX No,
I can't ((**figure that one out**)) VOX> (SBC: 003).

Clearly, in both cases, it is grammar that signals to us that some material is missing: *tell* in (a) requires a complement, and *can't* in (b) requires a main verb. Moreover, it is the grammar that dictates that the missing material is recovered under identity with previous linguistic constituents, again, in both cases. So, the fact that in (a) ellipsis is intra-sentential and in (b) it is extra-sentential does not really matter. In Ariel (forthcoming, 3.2.1) I discuss switch reference and obviation systems, where specific morphemes and pronominal forms are grammatically obligatory, although their application is (sometimes) defined by reference to discourse-level rather than sentence-level factors.

So, the first point about the intricate relations between discourse and grammar is that it's not impossible to find linguistic phenomena where the same generalizations and principles are applicable to both. Sentences may behave as if they were a piece of discourse, and discourse may obey grammatical principles. In sections 2 and 3 I turn to cases where grammar and discourse are indeed quite distinct, but the argument will be that the two interact in significant ways.

2. Grammar proposes discourse disposes

Discourse, as we have noted above, is not a random collection of sentences. Speakers have certain communicative goals when they engage in discourse. These goals often require a lot of inferencing above the linguistic decoding of linguistic strings. One thing speakers can do for addressees is choose their linguistic utterances in such a way that will facilitate the addressees in their

interpretations. This is why the constructions we actually find in discourse do not reflect a random selection of conceptually appropriate and grammatically well-formed strings. For any kind of message we wish to convey (content-wise), more often than not, grammar will make available more than one form. We have semantic paraphrases (e.g. *I **must** get some soda* – LSAC versus ~*I **have to** get some soda*), syntactic paraphrases (e.g. *Chelsea **was booed off** by their own fans* – WebCorp, versus ~*Their own fans **booed** Chelsea off*) and phonological paraphrases, or variants (e.g. *the horse **kinda** helps you out* – SBC: 001, versus ~ *the horse **kind of** helps you out*).[3] Such grammatical and conceptual equivalents are not necessarily discoursally equivalent, however. Some variants better serve the speaker's current discourse needs or goals than others. Section 2 presents three examples for how, when and why speakers strategically select certain but not other grammatical forms in specific discourse contexts. They exemplify what I mean by 'grammar proposing, discourse disposing'.

2.1. THE *I THINK* DISCOURSE PATTERN

The first example concerns the grammatically optional occurrence of complementizer *that* in English. Consider the following, where (a) is *that*less, and (b)–(d) contain an explicit complementizer:

5. a. SEAN: .. Oh I think it would be hard (SBC: 051).
5. b. JILL: You mean you actually thought **that** we had seen this before? (SBC: 028).
5. c. BEN: .. (H) This assures us **that** n- any excess water coming down the Colorado River... (SBC: 038)
5. d. LAJUAN: (H) he calls me and tells me **that** he wants to be with me (SBC: 044).

According to Thompson and Mulac (1991b), it is not at all surprising that 5(a) is *that*less, whereas (b), (c) and (d) are not. *That*less constructions are preferred with main clauses which have a subject *I* (or *you*, if the sentence is a question), a main verb present tense *think* (also *guess*), no indirect object, and no adverbial. The complement preferably has a pronominal subject. All these conditions are met by (a). Note that (b) has *you* for a non-question matrix subject, it includes an adverbial, and the verb is in the past tense. (c) has an inanimate matrix subject, a non-*think* verb, which takes an indirect object, and the complement subject is a lexical NP. In (d) the matrix subject is third person, the verb is neither *think* nor *guess*, and a direct object is included. No wonder (b), (c) and (d) each contain *that*. Thompson and Mulac support their claims with statistically significant data.

But why should discourse reflect any consistent patterns regarding +/– *that*, and why specifically the above tendencies? To answer this question we first need to consider what it is that speakers use complement-taking verb constructions for in natural discourse. Thompson's (2002) proposal is that these constructions typically convey a speaker's stance toward some proposition. The matrix part mostly expresses an epistemic evaluation, that is, how likely the embedded proposition is to be true. As such, the matrix mainly serves as a subjective framing for the contextually more relevant information contained in the embedded clause. For example, in 6(a), the response to Sean's *that*less 5(a), inquires about

the complement, what exactly would be hard, not about Sean's thinking, but the response to the *that*ful 5(b), 6(b), does address the epistemic stance expressed in the matrix:

6. a. SEAN: .. Oh I think it would be hard.
ALICE: ... What,
signing? (SBC: 051)

6. b. JILL: You mean you actually thought that we had seen this before?
JEFF: ... (H) No.
<X No X>.
Actually tha- I I –
.. No I didn't,
.. I just –
(H) I just.. thought that it was like pretty much factual (SBC: 028).

Once we realize what the frequent discourse function of these constructions is (the pattern in 5/6a, rather than that of 5b,c,d), the list of linguistic peculiarities above no longer seems surprising.

We can mostly report our own epistemic stances (hence the recurrent first person), although we can ask about the addressee's stance (hence, second person in questions). The specific set of verbs which occur in the construction are the ones suitable for expressing stances. The pronominal subject of the complement testifies that it hooks up with the preceding context, quite often, it's the topic of the utterance as a whole. Now, why no adverbials and no indirect objects? Because these would make the matrix too contentful and less of a mere epistemic framing for the complement. Finally, and most crucially, why is it that the more clearly epistemic framing cases preferably occur without a *that*? The complementizer serves as a clear signal that a separate, and specifically subordinate clause follows. But if Thompson's (2002) analysis is correct, then the so-called embedded clause is not interactionally subordinate at all, and the so-called matrix clause is not so much of an independent sentence, as it is a stance marker.[4] As such, it's closer to a sentential adverbial. If discoursally speaking, speakers analyze such constructions as an epistemic adverbial followed by a contextually relevant proposition which it modifies, we can understand why the discourse patterns created by these constructions are the way they are. Although grammatically speaking any subject, any adverbial and any indirect object can co-occur with a complement taking verb, speakers find only a restricted subset of these combinations to be useful for their discourse purposes. Clearly then, while grammar proposes a variety of options (all the above combinations), discoursal use very often calls for a careful and skewed selection of those options, tailoring the grammatical choice to the specific discourse context. This is what is meant by grammar proposing and discourse disposing.

Our next two examples are somewhat different. We see here that discourse patterns are skewed, not just because the messages we have use for in social interactions naturally call for some, but not other, grammatical patterns (as is the case for +/– *that* distribution). Rather, there are discourse-specific principles which directly dictate that we prefer some grammatical options over others.

2.2. THE PREFERRED ARGUMENT STRUCTURE DISCOURSE PATTERN

The first example we consider concerns discourse preferences regarding argument structures. A verb's argument structure is the specification of the arguments (i.e. nominal roles, such as subject, direct object, indirect object) it requires or allows. Consider the following, all perfectly grammatical English sentences containing the verb *meet*:

7. a. **They** never met until a long time down the road (LSAC)
7. b. **Mark and I** met at Alabama (LSAC)
7. c. BETH: ... I think **I**'d met **her** once before that though (SBC: 031)
7. d. WOOD: **I** met **all the great artists of that day**, (SBC: 05)
7. e. **My mom**'s met **them** (LSAC).
7. f. LAJUAN: and **my brother** had met ~**Ron**, (SBC: 044).

Meet can be either a transitive or an intransitive verb. As such, it may take either one argument (in the intransitive use) or two arguments (in the transitive use). Arguments are realized as NPs, which are grammatically free to be lexical, pronominal (or sometimes zero). This grammatical freedom is what (7) demonstrates. Nonetheless, when we examine natural discourse, some of these types of sentences are far more frequent than others. Just three patterns (a,c,d) account for practically all the data (96.5%).[5] The three other patterns (b,e,f) account for the remaining 3.5%. Why is that?

Du Bois (1987, 2003; Du Bois et al., 2003b) has convincingly argued that speakers demonstrate very strong preferences for some but not other realizations of the grammatical options in discourse. Specifically, he proposes that speakers distinguish between heavier and lighter processing tasks, making sure that processing their utterances will be a manageable task for the addressee. A major factor determining the load associated with the processing of some NP is the degree of mental accessibility with which its antecedent is associated (Ariel, 1990 and onwards). The more highly accessible the representation of the discourse entity denoted by the NP, the easier it is to process. Tracking the referent of the highly accessible continuing discourse topic, for example, is rather effortless (e.g. *she* referring to Snow White within the famous story), but retrieving a mental representation from long-term memory (e.g. *Hilary Clinton*, at this point in the paper), or creating a new ad hoc entity (e.g. *an iceberg* – see example 9 below), is more demanding. Du Bois's Preferred Argument Structure (PAS) theory explains how speakers very carefully and very consistently choose verbal arguments so as to not overburden the addressee.[6]

There's a very high correlation between degree of accessibility and referential form. Relatively uninformative, short and attenuated forms, such as pronouns and zeroes, are associated with highly accessible discourse entities. Relatively informative, long and phonetically heavy forms, such as lexical NPs, are associated with (varying) degrees of low accessibility. Thus, one discourse constraint Du Bois argues for is the One Lexical Argument Constraint:

8. Avoid more than one lexical core argument.

If lexical NPs tend to denote a lower degree of mental accessibility, and hence constitute a more challenging processing procedure, it is reasonable that speakers might try to not overload their addressees with too many lexical NPs. Note that the constraint specifies an upper limit only on lexical NPs, not on pronouns and zeroes. If the rationale behind the constraint is processing ease, this is just what we would expect. Only the harder processing cases are constrained. There's no ban against including two 'light' arguments (or even three where necessary). Re-examining the patterns in (7), the only case that violates (8) is 7(f). Indeed, such examples comprise a meager 2% (4/200) of the *met* cases checked. Though not grammatical, the discourse constraint in (8) is quite robust, then.[7]

Note, for example, what happens when the speaker of (9) finds herself in a situation where her message requires two lexical NPs:

9. **The boat** met with a, a I believe it was a, it was, **there was another boat or an iceberg**, I can't remember, but it was one of those things, and the boat sank (LSAC).

Why is it that once the speaker remembers the entities s/he wants to refer to s/he doesn't simply add them on? Alternatively, why doesn't s/he recycle her sentence to utter (10):

10. ~... The boat met with a, a I believe it was a, it was, **the boat** met with **another boat or an iceberg**...

Given PAS, it's not surprising that the speaker prefers a separate construction *(there was another boat or an iceberg*), where the added lexical NP can be the single lexical argument over a transitive construction containing two lexical NPs.

But (8) is not enough. There is an additional, very marked difference between the (d) and (e) patterns too. Although both are grammatical, and although both abide by (8) (they each include just one lexical NP), when we restrict ourselves to transitive cases, where we must have two arguments (178 cases), there were 45.5 (d) type cases for each (e) type case. The 2(e) pattern cases constitute only 1.1 percent of the transitive examples. The (d) pattern cases (91) constitute 51.1 percent (the rest have no lexical arguments at all). There is a difference between subjects and objects, reasoned Du Bois. Speakers do more than monitor raw amounts of processing load. They in addition strategically relegate costly processing to specific grammatical positions. Direct object position is one role that can (but need not) accommodate harder processing work. Subjects, and especially subjects of transitive clauses, are not such roles. This led Du Bois to formulate a second PAS constraint, the Non-Lexical A(gent) Constraint:

11. Avoid lexical A.

(11) explains why there are so many more lexical direct objects than agents in transitive constructions which contain a lexical argument.

Still, one could argue, as Haspelmath (2006) has, that we do not actually need the PAS discourse constraints per se, because the discourse patterns they account for fall out naturally from the contents we tend to favor in interaction (as we saw in the preference for the (non) occurrence of English *that*). For example, it's quite reasonable that the accessibility of the subject role follows directly from our natural tendency to refer to accessible subjects, since these

are typically human and topical, and hence, highly accessible to us (we often keep talking about the same human protagonist). This is certainly true (Du Bois, 1987), and in the *met* data, most of the intransitive subjects are light too (95.5%). But this natural tendency can't tell the whole story. Du Bois (2003) cites findings from Hebrew, Sakapultek, Papago, English, Spanish, French, Brazilian Portuguese and Japanese, which show that between 35 percent and 58 percent of intransitive subjects are lexical, but only 5 percent to 10 percent of the transitive subjects are. This is a very marked difference. Subjects are not all alike.

The natural tendency cannot explain why we prefer to introduce new NPs in intransitive constructions (existential constructions, verbs of appearance – see Kuno, 1975), where they are not agents, as in 12(a), rather than in a transitive construction (b) (and see 9 again), where they are agents:

12. a. ALICE: … And uh,
… one of the docs **came in** and saw all of his kids,
(H) and wrote orders on every kid (SBC: 043).
12. b. ~ One of the docs saw all of his kids…

Just like in (12), in (13) too there really is no need to refer to the events of 'coming in'. It's quite plausible that the speakers prefer to introduce the New entities with the 'come in' intransitive predicate just so they don't have introduce them in an A position:

13. a. It's not hooked up to that yet. You have to have a plumber **come in** and do that (LSAC).
13. b. <?> Who drank all the beer?
<?> ((PART OMMITTED)) There were four beers in there.
<?> You're kidding.
<?> <unclear>
<?> Somebody **came in** and drank all the beer (LSAC).

This is why the counterpart transitive constructions in (14) are absolutely coherent (the same applies to 13b):

14. a. ALICE: And then,
.. it was going pretty good this morning,
and the kids were real real good,
(H).. um,
… and then I was gonna get a new admit,
and had to get her from- from the other unit.
… And uh,
~… one of the docs saw all of his kids,
(H) and wrote orders on every kid.
b. ~ It's not hooked up to that yet. You have to have **a plumber do that**.

There doesn't seem to be any contextual requirement for introducing the 'coming in' events here. Most probably, the main purpose of the extra proposition is to enable the introduction of a demanding NP in a separate clause.

It is also interesting to examine the verb *boo* in this connection. If argument selection is free, and the observed skewed patterns fall out from the kinds of entities we tend to naturally talk about (in terms of degree of accessibility),

we would not expect a difference between the accessibility of (representations of) 'booers' in transitive and in intransitive cases. But there does seem to be such a difference.[8] Whereas almost 81 percent (34/42) of the intransitive subjects of *boo* were lexical, only 29.5 percent (38/142) of the transitive subjects were lexical.[9] It's not reasonable that intransitive subject 'booers' are just naturally less accessible to us than transitive subject 'booers'. Instead, it looks like speakers plan their utterances in discourse, choosing grammatically available options as they best fit their discoursal goals. In this case, they tend to introduce lexical subjects in the intransitive proportionately more than in the transitive construction. The discourse constraints articulated in PAS show that speakers try to manage processing costs, and the discourse patterns we observe are not just the result of natural recurrent discourse tendencies dictated by the content of speakers' messages. They are the product of discourse-specific strategies actively pursued by cooperative speakers.

2.3. THE DISCOURSE PATTERN OF PHONETIC REDUCTION

The third example I consider shows yet a different type of skewed patterns created due to speakers' preferences for some grammatical options over others. We see here how speakers consistently opt for certain pronunciations of words in specific contexts. Current thinking is that words are stored with a range of phonetic variation (Bybee, 2001). One well-studied phenomenon in English is the option to shorten or delete word-final *t* and *d*, in words such as *mist*, *kept*, *red* (Bybee, 1999; Gregory et al., 1999). Phonetic contexts favoring deletion are a preceding or a following consonant (*mi**s**t* versus *c**u**t*). A morphological factor is also involved: *t* deletes more often if it's not a grammatical morpheme (as it is in past tense forms such as *missed* or *kept* versus *mist*). On the other hand, planning problems (identified by speaker hesitations, marked by *um* or *uh*) inhibit divergences from citation pronunciations. But what we here focus on are a different set of contributing factors. First, frequent words manifest such reductive phenomena much more than infrequent words (e.g. *and*, *it* versus *sand*, *pit*). So do contextually predictable words. Words can be predictable because of the topic currently discussed: *food* is more predictable when the discourse topic is restaurants than when it is vacations. Collocational probabilities also contribute to some word token being more or less predictable. These are determined based on how often two tokens co-occur in discourse in adjacent positions. Words manifest different collocational strengths with preceding, as well as with following, word tokens. Some word tokens mutually predict one another *Viet* is a good predictor of *Nam*, and *Nam* is a good predictor of *Viet*. Predictability need not be mutual, however. It can be unidirectional. *Rid* is highly predictive of a following *of* (*get rid of*), but *of* is not so predictive of a preceding *rid*. *Least* is highly predictive of a preceding *at* (*at least*), but *at* does not predict a high probability for a following *least*. Finally, words repeated in the same discourse stretch tend to get reduced as well.

Gregory et al. (1999) examined over 8000 words from the spoken Switchboard corpus of American English telephone conversations ending in *t* or *d*, and they found strong evidence for the above distinctions. Deletion of final *t* and *d*

was much more likely with frequent words (e.g. *and*), with mutually predictable collocations, as well as with unidirectional predictabilities (in both directions). High semantic relatedness (to the discourse topic) and word repeats encouraged speakers to delete their final *t*'s and *d*'s very strongly too. Relevant word tokens where *t* or *d* were not deleted varied in duration, mostly according to the same factors. The highest frequency words were 22 percent shorter than the lowest frequency words, and the words most highly semantically related to the discourse topic were 19 percent shorter than were words with the lowest semantic relatedness. For example, the duration of pronouncing *coast* was 139 ms when it was highly related to the discourse topic (weather), but it was 404 ms when mentioned in the unpredictive context of a discussion about family budgets.

Once again we should ask ourselves why specifically these factors are involved in the preference for certain phonetic variants over others.[10] One might think that given that the grammar allows both options, speakers would almost always opt for the reduced forms, because this facilitates their production and makes for a more efficient communication, therefore. Alternatively, these choices might depend on overall speech rate, such that the faster the speech, the higher the likelihood for phonetic reduction. Although this is generally true, it does not detract from the significance of the above factors. Gregory et al.'s proposal is that all the factors they found to be relevant have something in common, which makes them good candidates for affecting reductive processes. Each of them provides a high probability for the occurrence of the relevant word or phrase. Intuitively speaking, reduction occurs when the word or phrase can be more easily accessed by the addressee despite the reduction, because he has a chance of predicting the occurrence of the word some other way. Frequent words have what Gregory et al. call a high prior probability (regardless of the specific discourse context), because they occur so frequently in general. They come to mind, so to speak, just because speakers and addressees encounter them very often. All the predictability measures similarly boost the addressee's ability to process the word or phrase, again because their probability is high, in such cases, due to the specific context.[11]

Indeed, there is evidence that addressees can and do engage in making concrete predictions about oncoming linguistic expressions (Delong et al., 2005). They are surprised (and hence slowed down in processing) when an unexpected argument follows a verb. For example, a verb which is mostly used as an intransitive, but is used transitively in the experiment, causes processing difficulties for subjects (Trueswell et al., 1994). Here's a case in point, from an advertisement in Hebrew:

15. olmert, barak ve=netanyahu **zakaim**
Olmert, Barak and=Netanyahu are innoncent/entitled to (Billboard, spotted May 2008).

Zakai is ambiguous between the one-argument predicate 'be innocent' and a two-argument predicate 'be entitled to' (*-im* is a plural marker), where the theme is not explicitly mentioned. But when one reads the above ad, the salient reading that comes to mind (Giora, 2003) is the 'be innocent' reading. This is not only

because it is the more frequent meaning, it is also the one more relevant in the specific context in connection with these three Israeli politicians, each of whom have been charged or at least interrogated by the police about possible corruption. Thus, when in much smaller font, the ad continues that each state employee – which, of course, the three politicians are – is entitled (*zakai*) to some loan that the bank is offering, the reader is taken by surprise. This is the reaction that the advertisers are after, and they take advantage of our automatic habit of reading ahead to secure it.

If so, speakers can 'afford' to be more 'sloppy' in their articulation of certain word tokens, provided discourse circumstances are such that comprehension will not be hampered. In fact, whereas originally, the assumption was that speech economy (that's what reduction is) is beneficial for the speaker but counter-productive for the addressee (since it makes processing more difficult for him), Levinson (2000) emphasizes that speech economy is actually beneficial for the addressee as well, for explicit linguistic material is quite unnecessary when the addressee can infer it faster than the speaker can articulate it. If so, there is mutual interest in speech economy. The point is that speakers don't use it randomly, just because their grammar is compatible with it. They carefully monitor for the appropriate discourse conditions before they exercise reduction.

All in all, we have seen that speakers make a very selective and strategic use of grammar, based on a variety of discourse motivations. Choices between roughly equivalent linguistic forms are far from random. Whereas grammar often proposes a few alternative forms, discourse use narrows these options down. I have discussed three such cases in section 2. First, only a small subset of the potential constructions containing clauses embedded under main clause verbs are consistently used by speakers (there is a marked preference for the matrix to contain certain verbs, first person subjects, etc.). Second, only some argument structure options (regarding lexical versus pronominal/zero NPs) are consistently employed by speakers (e.g. no more than one lexical NP, preferably no lexical agents). Third, in specific discourse contexts (affording a high probability for certain words), some phonetic variants (reduced ones) are consistently preferred, whereas in other discourse contexts, different, non-reduced variants are consistently preferred. There is much more to discourse use than is dictated by the grammar. There are form/function correlations which are not grammatically specified, but nevertheless guide speakers in their linguistic choices.

In all the cases examined speakers construct their utterances so as to match their context-specific discourse goals. But the cases are not all alike. In the first case, since speakers use verbal complement constructions to convey an epistemic stance on some proposition, they hardly have a use for certain messages that the grammar is in principle perfectly capable of expressing. The discourse pattern thus created falls out naturally from the recurrent content of speakers' messages. A more active role must be attributed to discourse principles in the two other examples. Here speakers prefer specific forms over others not because of the conceptual content they want to convey, but because they are following discourse-specific constraints, both related to ease of processing

and/or production. Since they do not wish to overburden their addressees, speakers construct their argument structures in a rather restricted manner. The consequence of this tendency is that some options are used very often (e.g. where verbal arguments include one lexical NP at most), others only rarely so. Last, speakers save on articulation, and hence on both production and processing, when discoursally unnecessary (phonetic reduction). In other words, there is some discourse-defined goal behind each of these selective discourse patterns, which is not reducible to grammatical convention. The examples we gave, we should emphasize, only constitute three instances out of a myriad of discourse strategies that speakers follow when using their grammar to effectively convey their messages in natural discourse. They all point out how discourse principles, motivations and considerations mediate between potential grammatical products and the grammatical forms we actually find in discourse: grammar proposes, while discourse disposes.

2.4. THE PSYCHOLOGICAL REALITY OF SALIENT DISCOURSE PATTERNS

Before we move on to the next point of interaction between grammar and discourse we should stop to think what relevance, if any, the findings above have for individual speakers. It seems quite clear that extragrammatical motivations are relevant for discourse, and that these are, moreover, manipulated by individual speakers (and addressees). It is also objectively true that this goal-directed language use leads to the creation of consistent discourse patterns. But what status do these resulting discourse patterns have for speakers? What consequences?

Whereas there can be no doubt that the findings presented above constitute statistically significant discourse patterns, we have not yet established that the patterns themselves play any role in people's use of language. In other words, perhaps all interlocutors are working with are the discourse principles themselves. They then produce the skewed grammatical patterns as by-products, but they assign no significance to them. Indeed, speakers are certainly not (consciously) aware of these patterns. Most often people are surprised to learn that, for example, their use of complementizer *that* is anything but random, that they routinely avoid more than one lexical NP per argument structure, and that their *t* and *d* reductions are to a large extent predictable. If so, are the discourse patterns noted throughout this section merely epiphenomenal, simply the unavoidable outcome of plausible discourse strategies which are inconsequential in and of themselves?

It's possible that many discourse patterns are just that, namely cases where the researcher can find statistically significant patterns of language use, but these patterns have no relevance for speakers. Perhaps the following is such a case. There seems to be a difference between *met* and *met with* with respect to one versus zero lexical arguments (both show virtually no cases of two lexical NPs). *Met* has an equal number of zero versus one lexical argument (83 cases of zero lexical NPs and 84 cases of one lexical NP). But *met with* has 3.25 cases of a lexical NP for each zero lexical NP case (13 versus four). Suppose that these findings are replicated in larger corpora. Does this mean that the pattern is

psychologically real for speakers (even if unconsciously so)? I suspect it isn't, but the fact is that we can't really tell. Researchers have recently come to the conclusion that speakers must have an enormous capacity for storing statistical data on language use. An intriguing finding by Bod (1998, 2005) is that subjects responded faster to a string of words if it is one frequently used in discourse, even if the interpretation of the string was strictly compositional (combining the meanings of the words in them in a simple additive manner). The differential response times were obtained despite the fact that the individual words involved were matched for frequency. In other words, it looks like strings which are not at all collocational (we know that collocations must be stored together) are somehow available to speakers if the string is frequent enough. The upshot of such experiments is that speakers are especially good at tracking and maintaining statistically significant discourse patterns, no matter what their sources are. This lends support to the hypothesis that salient discourse patterns are psychologically real for speakers, even when representing them seems quite superfluous, for example, *the sun*, stored as a word, together with the definite article (Bybee, 2001, 2002).

It is such storage of frequent strings which can explain why some units of language which seem completely transparent to speakers of one language, in that they combine together conceptual materials in a perfectly rule-governed way, may nonetheless be opaque, unnatural, hard to process or downright unacceptable for speakers of another language. Consider forms of request. English speakers often use *can you . . .?* (16a) and Hebrew speakers often use *at muxana . . .?* 'are you (feminine) ready . . .?' (16b) to convey requests. In addition, one can preface Hebrew requests with *im lo ixpat lax . . .* 'if you (feminine) don't mind . . .' (17a) and *im lo kashe lexa . . .* 'if it's not difficult for you (masculine) . . .' (18a) for special (politeness) effects. Superficially, we have no reason to assume any language-specific conventionality in the use of any of these expressions. The associated illocutionary force of polite requesting can be inferred from any of the above literal meanings. Indeed, there is no problem for Hebrew speakers to interpret requests expressed by the Hebrew counterpart of English *can you . . .?* (16c), and requests prefaced by either *if you don't mind* or *if it's not difficult for you* can equally be interpreted by English speakers (17b, 18b). Here are the relevant examples:

16. a. RON: **Can you** move your chair (SBC: 019).).
16. b. **at** **muxana** la=tet li et ha=telefon
You (are) ready to=give me (acc) the=phone
shel ha=metapelet?
of the=nanny?
'Can you give me the nanny's phone number?'
(www.health.gov.il/Download/pages/THeNeedForDialog)
16. c. **ata** **yaxol** la=tet li kcat pratim?
You can (to)=give me some details?
'Can you give me some information?'
(www.pocket.co.il/community/showthread.php?t=194084)

17. a. **im lo ixpat lax**, tashiri et ha=makom naki
If you don't mind, leave (acc) the=place clean
u=mesudar.
and=tidy (www.e-mago.co.il/Editor/actual-1143.htm).

17. b. Some of you . . . will go through the same procedures in the fight against colorectal, breast, lung, prostate or a host of other cancers. It is imperative that you know what's going on here.
So, as Nurse Arlene said to me last Thursday . . . "**If you don't mind**, pay attention please!" (www.colorectal-cancer.ca/en/find-support/inspirational/tom-philip-journal/you-don-please/).

18. a. **im lo kashe lexa** cor iti
If (it's) not difficult for.you form with.me
kesher,
connection (www.carsforum.co.il/vb/archive/index.php/t-112105.html)
'If it's not difficult for you, get in touch with me,'

18. b. So, **if it's not difficult for you**, please show me some links to it. . . .
(moc.daper.net/node/187).

Although speakers of either language can interpret, and sometimes even use, the expressions more characteristic of the other language, there's a difference in the use of the expressions in the two languages. *Can you . . .?* requests are very common, and in fact, rather conventional in English.[12] Requesting by prefacing the request with either *if you don't mind* or *if it's not difficult for you* is not very common in English (there were no such cases in SBC and LSAC). Hebrew speakers also prefer to use *at muxana . . .?* 'are you (feminine) ready . . .?' where English speakers might use *can you . . .?* requests. English speakers can't really use this form (observe: ~?? 'Are you ready to give me the nanny's phone number?').[13] And while the request forms in (17) and (18) are polite in Hebrew, they are no longer as polite as their literal meaning might lead one to expect. And in English, in fact, *if you don't mind* creates the impression that the request should not have been issued even (because the addressee should have done it on his own – see 17(b)). As such, it is not even a polite request. Unlike in English, these request forms are formulaic in Hebrew. Being formulaic means that they are not intended by the speaker nor interpreted by the addressee word-for-word. Rather, they get interpreted as a single chunk with a single, unanalyzed function, which is a bleached version of the original, highly polite compositional interpretation.[14]

Such form/function chunking can only emerge by recurrent use in discourse. If *can you . . .?* questions are frequently used in order to indirectly convey a polite request, they can come to convey the meaning of request, without the addressee having to first process the literal question meaning and only then deriving the inferred request. The same is true for the two other expressions. The idea is then that while in English it is the frequent use of *can you . . .?* questions for requests that became a salient discourse pattern for speakers, in Hebrew it's the association between the other forms and requests. Salient (mostly frequent) discourse patterns must have psychological reality for speakers, then. They are represented together with their discourse-derived use and/or interpretation.

The discourse patterns identified in section 2 are then not necessarily mere statistical researchers' observations. It's quite possible that they have some standing, as well as consequences for speakers. This is what we examine in section 3.

3. Discourse proposes, grammar disposes

The findings presented in section 2 show grammar to be freer than discourse use. The use patterns revealed in discourse are a rather small subset of the options allowed for by the grammar. We now turn to see that a similar selection process operates when we shift from discourse to grammar. But first, we have to explicate what it means 'to shift from discourse to grammar'. It's quite obvious, in fact trivial, to assume that discourse makes use of grammar. But can we say that grammar too makes use of discourse? Research in the last few decades has convincingly shown that the answer here is yes, very much so. The idea is that discourse patterns, such as those discussed in section 2, sometimes turn into grammatical conventions. Yesterday's salient discourse patterns may become today's grammatical conventions. I examine a few such cases in section 3. In fact, the examples selected for section 2 were chosen with a view to potential grammaticization processes. I now show how some of the discourse patterns noted above may have grammatical consequences. This is what I mean by grammar 'selecting' from discourse. Some, although not all, discourse patterns result in chunking into conventionalized form/function correlations. In other words, they turn grammatical. It is salient discourse patterns, for the most part frequently used ones, that have a propensity (but no more than that) to be selected for grammaticization convention.

3.1. DISCOURSE PROPOSES, SYNTAX DISPOSES

The first discourse pattern we discussed in section 2 involved complement-taking verbs, such as *I think . . .* We noticed some salient discourse patterns in connection with such predicates. Regarding the matrix, present tense *think* is the leading verb, *guess* is the second, *I* is the leading subject, and the sentence tends to lack optional constituents (adverbs, direct objects). All this, we noted, adds up to the profile of a stance framing constituent. Regarding the complement we noted that it tends to revolve around the current discourse topic, and in general be the contextually relevant portion of the speaker's utterance. It also tends not to be introduced with a *that*. Looked at functionally, then, it seems that the relationship between the complement and the matrix here very much parallels the relationship between some proposition and an epistemic stance adverbial, such as *apparently* or *maybe*. Indeed, see how *I think* and *maybe* are used interchangeably in the following:

19. a. SCOTT: ... **Maybe** we could –
I think it,
... would probably do better,
if it got its babies trimmed off (SBC: 034).

19. b. Right... right... **maybe** they can fax 'em... **I think** they can, (LSAC).

Now, sentence adverbials, such as *apparently* and *maybe* have a very special syntactic property. They can occur sentence-initially (as in 19), medially (20a) or finally (20b):

20. a. KIRSTEN: there was.. **maybe**... ten.
.. That were,
.. you know,
I say eligible (SBC: 039).
20. b. When you get back **maybe**... (LSAC).

If discourse patterns sometimes constitute psychological realities for speakers, and if *I think* forms part of such a salient discourse pattern where it is taken to provide an epistemic stance, the recurrent form/function correlation between *I think* and 'an uncertain epistemic stance' may carry grammatical consequences. For example, it's possible that language users will reanalyze *I think* as a sentential epistemic adverbial, since this is how it often functions in discourse. Once such reanalysis occurs, a grammatical change has been introduced into the language. A sentence adverbial has been created out of a syntactic clause. Indeed, there is evidence that this process is well on its way (Thompson and Mulac, 1991a). Just like full-fledged sentence adverbs are free to occur in a variety of syntactic slots within the sentence, so we find *I think* in such slots (medial position in 21a, final position in 21b, and see also *you know* and *I say* in 20a):

21. a. The book by itself is **I think** thirty dollars? (LSAC).
21. b. She's nice **I think** (LSAC).

Matrix-sentence *I think* could not possibly occur in these syntactic positions. The *I think* occurrences in (21) must be analyzed as epistemic adverbials. Here are some statistical data from Thompson and Mulac (1991a), attesting to the ongoing grammaticization. As we mentioned above, just two verbs, *think* and *guess* constitute a very high percentage of all occurrences of complement taking verbs (65%).[15] The two verbs constitute an even higher percentage of the cases of the epistemic parentheticals (as in 21) – 85 percent. The absence of *that* is quite frequent for complement taking verbs in general, but for *think* and *guess* it's approaching obligatoriness (91% of *think* and 99% of *guess* were *that*less, as compared with 76% of the other verbs). First-person subjects are predominant as matrix subjects in such constructions (83%), but they approach categorical status for epistemic parentheticals (95%). The association of *I* with a *that*less complement (90%) is also much higher than that for other persons (64%).[16]

The importance of these numbers is that they show that natural discourse tendencies (i.e. that certain constructions just happen to be very useful for certain functions) cannot alone account for the data. If functionally driven propensities were the whole story, we wouldn't find a discourse profile for *think* and *guess* which is different from that of other similar verbs. For example, why are the complements of specifically *think* and *guess* hardly ever prefaced by *that*? The fact that there are such differences indicates that these two verbs have come to constitute quite conventional means for expressing epistemic stance, which accounts for why their patterning is becoming so rigid, so formulaic (first person, no *that*). The use of *I think*/*guess* then demonstrates how discourse patterns may turn grammatical, how grammar 'chooses' some, but not other,

discourse patterns for grammaticization. The elevation of the formulaity of specifically *I think*/*guess* shows that they have been selected for grammaticization. Now, of course, no rational, intentional or conscious decision is ever taken by anybody. The selection is unconsciously performed by individual speakers in specific contexts because the expressions best suit their current communicative goals. In due course, however, the specific verbs are not only selected for these reasons, but also because of their high frequency in the construction. Thus, whereas discourse proposes a variety of consistent discourse patterns (for all complement taking verbs), grammaticization is often restricted to a subset of these patterns. We should note, however, that grammaticization is an ongoing process, and it's not impossible that the grammaticization process observed by Thompson and Mulac would be extended to other verbs at a later point. Indeed, Thompson (2002) notes that in addition to *think* and *guess*, *remember* and *know* too tend to occur in formulas. For example, *I remember*, *I can't remember* and *I don't remember* constitute 80 percent of the occurrences of complement taking *remember*.

Next, two PAS constraints were introduced in 2.2. One of them calls for avoiding New Agents. Interestingly, Larsen's (1981) findings for the ergative Mayan language Aguacatec are that no New Agents occurred in his data. It is quite possible that in this language a grammaticization process has led to an entrenchment of the discourse preference into an obligatory principle banning New Agents. As John Du Bois (personal communication) points out, ergative languages, rather than accusative languages, are more likely to grammaticize this discourse constraint, because agents constitute a grammatical category in these languages.

Finally, recall the Hebrew discourse pattern which associates the counterparts of *if it's not difficult for you* and *if you don't mind* with requests. It is this association that can account for why the following are grammatical, although they contain an embedded (conditional) clause not accompanied by a main clause:

22. a. xaimon, **im lo ixpat lexa** le=hanmix kcat et
Haimon, if you don't mind to=lower a bit (acc)
ha=kol
the=voice (www.ynet.co.il/articles/0,7340,L-3443013,00.html)
'Haimon, could please you lower your voice a bit?'

22. b. **im lo kashe lax** le=yaec be=od
If (it's) not difficult for.you to=give.advice on=another
mashehu xashuv.
important matter.
(www.doula.co.il/Index.asp?CategoryID=309&KeyWords=&SearchCategory
=&Show=1&Page=10)
'Could you please give some advice on another important matter?'

Note that in the examples in (17) and (18), the initial conditional antecedent (e.g. 'if it's not difficult for you') is followed by a main clause consequent which expresses the actual request ('get in touch with me'). These are then well-formed conditional sentences. This is not the case in (22), where the consequent clause

seems to be (syntactically) missing. The conditional antecedent functions as a complete grammatical sentence here. In general, just like in English, conditional antecedents cannot form independent sentences in Hebrew. But we can explain such uses by reference to the recurrent use of these specific conditional antecedents to preface requests (initially properly conveyed by the conditional consequent). Because they often accompanied requests, these conditional antecedents themselves were gradually interpreted as indicating requests. If that's the case, then the conditional antecedent need not be perceived as part of a complete conditional sentence, but rather as a request. Requests, of course, do not require a bi-clausal construction, and hence the creation of a conditional antecedent request form used for requests in Hebrew. Note that this grammaticization process occurred in Hebrew (more so for 'if you don't mind' than for 'if it's not difficult for you'), but not in English. This is why the literal English translations of the examples in (22) are unacceptable:

23. a. ~?? Haimon, if you don't mind lowering your voice a bit.
23. b. ~?? If it's not difficult for you to give advice on another important matter.

To see that the problem is indeed the missing syntactic clause compare (23) with (24), where once we add an appropriate conditional consequent, the English translations become perfectly grammatical:

24. a. ~ Haimon, if you don't mind lowering your voice a bit, **please do**.
24. b. ~ If it's not difficult for you to give advice on another important matter, **can you please do so**?

This grammaticization example too shows that grammar follows the salient discourse pattern. It seems that in Hebrew, much more than in English, specific conditional antecedents have been associated with requests (i.e. they constituted a salient discourse pattern). This is why they could have turned grammatical.

The examples in 3.1 point to a rather dramatic conclusion, namely that discourse use determines grammatical (in this case, syntactic) status. Grammatical patterning and/or (re)categorization follows a subset of (recurrent, salient) discourse patterns.

3.2. DISCOURSE PROPOSES, THE LEXICON AND MORPHOLOGY DISPOSE

We discussed the tendency to reduce lexical items which are of a high contextual probability for one reason or another in 2.2. Such phonetic processes often account for conditioned phonetic variations, when the specific discourse context favors reduction. But such processes may also have long-range effects. The reduced forms proposed in some discourse contexts may become the forms used in all contexts. In other words, they may turn lexical. That this is the case for high frequency (= high probability) lexical items in general has been known since at least Zipf (1929), who found a significant correlation between word frequency and length, such that the more frequent lexical items tend to be shorter lexical items. This is especially evident for high frequency function words, such as the English indefinite and definite articles, *a* a reduction of *one*, *the* a reduction of *that*. But open-class items too show a length gradation which corresponds to

their frequency of use (Hooper, 1976). The current articulation of the original schwa in English *every*, *artillery* and *memory* shows it is completely absent in *every*, not at all reduced in *artillery*, and intermediate in *memory* (the *r* is syllabic). These pronunciations are no longer phonetic variants of the original schwa. They have come to represent the phonetic shape of these words. The frequently used phonetic variants have been incorporated ('selected') for the lexicon. The reason is that the more frequently a word is used, the more opportunities speakers have of applying the sound reduction, and hence, the more entrenched the change may become for frequent words.

These phonetic changes have been completed. Many others are no doubt on the way. Bybee (2000) argues that *t*/*d* deletion in English is advancing at different rates within the lexicon. Once again, frequent words undergo the change faster. Frequent verbs show a past tense *-ed* deletion more than twice more often than infrequent verbs. In line with probability rate, double-marked past tense verbs, for example, *told*, *left* (where past tense is indicated by both vowel change and *-ed*, and is hence even more predictable) undergo more reduction than regular past tense verbs. Moreover, these various probability factors seem to add up. For example, *told* (high frequency and double-marked) was reduced in 68 percent of its occurrences, while *left* (double-marked, but much less frequent) was reduced in only 25 percent of the cases.

High probability is not the only trigger for phonetic reduction. Items that are often processed together may be stored together, thus paving the way for their grammaticization as a single unit. We've mentioned the high frequency with which *I think* functions as a single syntactic phrase used to express epistemic stance. No wonder, then, that *I think* is actually often pronounced as the reduced *aiŋk*, a single phonological word. Hebrew present tense verbs hardly ever allow zero subjects, but certain negative verbs, precisely those frequently used to express epistemic stance do. Contrast, for example, ~?? *lo mitlabeshet* 'don't/doesn't get dressed-feminine' for any female first-, second- or third-person referent, with *lo yodaat*/*xoshevet* 'don't think' for specifically first person '**I** don't know/think':

25. S: im kaf naalaim hu hixnis et ze?
With (a) shoe horn he inserted (acc) this?
M: **lo** **yodea**.
Don't know.
'S: Did he put it in with a shoe horn?
M: (I) don't know. {Lotan, 1990 #1349: 5).

Speakers often even reduce these into *lo* = *xshevet* 'don't = think', *loydea* 'don't know', similar to the reduction of *I don't know* to *dunno* (Bybee, 1999). Such reductions are not restricted to current Hebrew. Older speakers may use *nendea* 'I don't know', short for *eineni yodea* 'I don't know'. In other words, the exceptional zero subject varieties, restricted to first-person subjects of specific mental verbs, are not grammatical idiosyncrasies. They are well-motivated by the common discourse use speakers make of such phrases, namely, expressing stances.

Next, in general, present tense verbal forms in Hebrew only inflect for gender and number, but not for person. In Ariel (1998) I discussed a limited number of verbs which do show an agreement marker for person in present tense in certain formal, mostly written registers of Hebrew. Crucially, the verbs are all mental verbs (e.g. the counterpart of 'think'), and the only person they inflect for is singular first person (e.g. *xoshvani*, short for *xoshev ani* 'think I' = 'I think', but no grammaticized cliticization exists for e.g. **xoshvat* for 'think you.fem'). Considering the facts about the common use of English and Hebrew epistemic clauses, especially of *I think*, it's not surprising that Hebrew has inflected forms only for first person singular in this case. If the counterpart of *I think* was used often enough and for a specific epistemic purpose, it may very well have been classified as one category and then even grammaticized. This is how a rather exceptional set of forms has been created, where a verbal form which doesn't usually have person marking at all (present tense) comes to have it (see Bybee, 2001, for analyses of many similar cases). The only way to explain such an idiosyncratic marking fact is by reference to the unique role first-person mental verbs play in discourse, namely to indicate epistemic stance. If so, a recurrent discourse pattern, whereby a first-person pronoun serves as the subject of some 'think' verb and used to indicate epistemic stance, may become salient, which may lead to its reanalysis as a single processing and storage unit.

While the very special and highly restricted marking paradigm of high Hebrew 'think' is quite idiosyncratic, the typologically unmarked verbal person paradigm is also in need of some explanation. A recurrent finding from many languages which carry obligatory verbal person agreement markers is that they do not mark every person. Once again, which persons tend to be marked and which tend not to be is not random. Typically, overt person inflections are found for first and second persons, but third-person verbal marking is often missing (Benveniste, 1971; Siewierska, 2004). This asymmetry is puzzling. Now, a very common source for verbal person agreement markers are independent pronouns (Greenberg, 1966). So, why is it that first- and second-person pronouns may reduce to become person agreement markers on verbs, but not so (or significantly less often) for third-person pronouns? The explanation I offered was that there are specific discoursal circumstances in which subject pronouns tend to be phonetically reduced (Ariel, 2000), and such circumstances are more frequent for first- and second-person pronouns than for third-person pronouns. Let's see why.

Some discourse entities are highly accessible, others less so. We have already mentioned the difference between lexical and pronominal NPs, the former used for entities not highly accessible to the addressee (2.2). This difference is by no means the only difference we find among NP forms. Just as degrees of mental accessibility come in a very rich gradation, so do the referential forms that accommodate them. Specifically, I have argued that reduced (cliticized) pronouns are used to refer to more highly accessible discourse entities than full pronouns (Ariel, 1990 and onwards). To see that speakers distinguish between full and reduced pronouns consider the following:

26. ((Preceding discourse translated: Cameron$_i$... HE$_i$... he$_i$ talked to Nubar$_j$... Nubar$_j$ said... Nubar$_j$ was still...))
h$_i$ (=hu) pashut diber ito$_j$ hu$_j$ xasav...
H$_i$ (=he) simply talked with.him$_j$ He$_j$ thought...
(Private conversation, 8 January 1987)

In (26) Cameron is the continuing discourse topic (the most highly accessible discourse entity), when Nubar is introduced. The speaker first distinguishes between the two singular masculine referents by referring to the more accessible Cameron by pronoun and to the less accessible Nubar by name. But then, once Nubar too becomes highly accessible (having been mentioned three times), he is referred to by a pronoun, and the more accessible Cameron is referred to by a cliticized pronoun. In other words, there is a difference between a full pronoun and its reduced version, such that the reduced alternative indicates a higher degree of accessibility.

The following examples, translations of an originally English story by Alice Walker into Hebrew, show a contrast between reference via verbal person marking alone (when an overt subject is absent), and an overt pronoun in Hebrew. First-person past tense verbs obligatorily mark for person in Hebrew. An overt first-person pronoun is then informationally speaking redundant. Still, natural discourse shows that speakers have preferences for when to include the 'redundant' pronoun and when to leave the subject slot empty. Once again, it is the more accessible referent which takes the zero pronoun:

27. a. ze haya davar shel ma bexax bishvil yalda o
It was nothing for (a) girl or
isha le=heanes. ani acmi neenasti,
(a)woman to=get.raped. I myself was.raped-1st.sg,
kshe= **0** hayiti bat shtem esre. ima af paam
when= [I] was.1st.sg twelve years old. Mama never
lo yadaa, u= **0** meolam lo siparti le-
(not) knew, and [I] never (not) told.1st.sg (to)
ish. (*Noga* 1985).
anybody.

27. b. hu pashut himshix le=nasot le=alec oti
He just kept trying to=make me
la=cet ito, ve=lifamim, mi=tox hergel, ani
(to)go with him, and sometimes, out of habit, I
xoshevet, **0** halaxti ito. gufi asa
guess.fem sg, [I] went.1st.sg with.him. My.body did
ma she= shulam she=yaase. ve=ima meta.
what (that) [it] was.being.paid to do. And=Mother died.
ve=**ani** haragti et buba.
And=I killed.1st.sg (acc) Bubba. (*Noga* 1985).

The continuing discourse topic of the Alice Walker story is the first-person narrator. Hence, zero pronoun forms are common (for past tense verbs). The interesting difference comes at the end of each example. Note that the penultimate sentence in each case shifts to a different sentence topic, the mother in both cases, and then the final sentence resumes talk about the first-person

heroine. Still, the reintroduction of the narrator is different in (a) and (b). A zero subject was chosen by the translator in (a), a pronoun in (b) (both contain pronouns in the English source). The explanation for such cases is that even continuing discourse topics are not always guaranteed an extremely high degree of accessibility in all contexts. The difference between (a) and (b) is that only in (b) is the sentence about the mother a potential discourse topic changer. The death of the mother is predicted to change the plot. Not so the mother not knowing about the rape, which is naturally interpreted as part of the current discourse topic. In other words, speakers (and writers) are very sensitive to how accessible discourse entities are, and they choose their referring expressions accordingly. Although pronouns encode a rather high degree of accessibility, sometimes it is not high enough, and a higher accessibility marker is needed. Reduced pronouns and zeroes are such referring expressions, because the more attenuated (phonologically minimal) a form is, the more accessible the antecedent it refers to is expected to be.

Now, if verbal person agreement markers derive from independent pronouns which first reduced and cliticized and later became bound and obligatory forms, it is reasonable to assume that extremely high accessibility contexts paved the way for the creation of agreement, for it is such contexts that call for pronoun reduction, sometimes elimination, as we have seen in (26) and (27). Going back to the question of which persons would be more likely to undergo such grammaticized reductive processes, we can now understand why it is specifically first- and second-person pronouns which tend to develop into verbal agreement markers. First- and second-person referents are the ones co-present during conversation time. They are far more likely to be highly accessible to the interlocutors than third-person referents, which come in a variety of degrees of accessibility. While often enough a third-person entity is the continuing discourse referent, and hence highly accessible (Cameron in 26), no less often is it the case that third-person referents are discourse entities entertained at a rather low degree of accessibility (Nubar at first, *nurse Arlene* in 17b, *the book by itself* in 21a). In other words, it is only for first- and second-person referents that there is a *consistent* discourse pattern whereby the subject referent is extremely accessible (see Ariel, 2000 for relevant discourse counts). No wonder then that the grammaticized reduction process is often restricted to these two persons, to the exclusion of third person.

Recall Du Bois's PAS, which calls for agents to be given, but not necessarily so for intransitive subjects and direct objects. Ergative languages distinguish between transitive subjects (ergatives) and intransitive subjects. The latter are classified as absolutives, together with direct objects. Crucially, when such languages have verbal person agreement, absolutives are usually not marked on the verb, whereas ergatives may be. Once again, it is the argument most likely to be consistently highly accessible (the ergative) that may get overtly marked on the verb, whereas the absolutive, which is only inconsistently highly accessible, is not. It is the ergative verbal form which is minimal (bound person agreement, no overt subject NP). The absolutive is often expressed by less minimal forms (pronouns and lexical NPs).[17]

4. Discourse, grammar, universality and arbitrariness

Our discussion so far has shown that discourse patterns are motivated by communicative functions. Now, if discourse patterns reflect an only reasonable use of the current grammar in a way that optimizes our communication with others, we should expect different languages to manifest quite similar discourse patterns. After all, interlocutors everywhere aim to convey their messages in a most effective way, that is, taking into account their addressee's as well as their own needs. This is why they try to be relevant, clear, short and they take into account what assumptions their addressees are or are not able to mobilize in interpreting their utterances etc. They do their best to not overburden their addressees (see especially Sperber and Wilson, 1986/1995). They also naturally tend to produce utterances which facilitate their own production (recall the reductive processes mentioned above). If so, we should expect: a) virtually the same discourse patterns for different linguistic communities; moreover, since grammar naturally evolves out of salient discourse patterns, b) the grammars of all natural languages should be motivated, and c) virtually identical.

There is some empirical support for these hypotheses. Researchers have definitely found similar discourse patterns across different languages (as a) predicts). Narrative structure, and more generally rhetorical structure seem universal on the whole. Zeroing in on specific salient discourse patterns of the sort we have focused on in this overview, Haspelmath (1999) proposed that possessed NPs, such as *Mitch Roberts'* ***check*** – SBC: 053; ***the death*** *of Cesar Chavez* – SBC: 012, tend to stand for definite, that is, identifiable discourse entities, because they introduce anchored discourse entities (they are anchored to the possessors, e.g. *Mitch Roberts*, *Cesar Chavez*). Indeed, when Haspelmath counted how many of the possessed NPs in two written English texts were in fact interpreted as definite, he found that almost all of them were (94%). This is not the case for NPs in general, where just over two-thirds of NPs are definite (67%). Crucially, Haspelmath obtained very similar results for Italian and Modern Greek. In other words, possessed NPs tend to present identifiable discourse entities, and this is a recurrent discourse pattern cross-linguistically (most probably).

Even when grammars are different in the relevant respect, similar discourse patterns persist. Du Bois (1987) has looked at the discourse profiles of transitive subjects, intransitive subjects and direct objects in English and in Sakapultek, two grammatically different languages with respect to the marking of these arguments. English is an accusative language, which classifies together transitive and intransitive subjects (as subjects). In accusative languages such as English, subjects, whether transitive or intransitive, but not direct objects, govern verb agreement. Sakapultek, on the other hand, is an ergative language, which distinguishes between transitive subjects on the one hand (labeled ergatives) and intransitive subjects and direct objects, classified together (as absolutives) on the other. The morphologies of these languages reflect this different classification. Nonetheless, Du Bois found that in both English and Sakapultek the entities presented as transitive subjects are overwhelmingly accessible, the entities presented as intransitive subjects are topical, and the entities presented as either

intransitive subjects or as direct objects are not consistently accessible. Some of them are new in the discourse. In other words, regardless of the accusative/ergative type of language, the same discourse patterns reflecting PAS constraints are observed.

Next, grammars too exhibit striking commonalities (in accordance with (c)). For example, many unrelated languages do not allow the modification of a possessive NP by a definite article (**my the check*, **the my check*, **Roberts' the check*, **the Roberts' check*), at least in one of their possessive constructions (Haspelmath, 1999). A more complex type of universal was offered by Keenan and Comrie (1977). According to their proposal, a universal NP Accessibility hierarchy determines what syntactic roles (such as subjects, direct objects, obliques, etc.) can be relativized in relative clause constructions (in other words, what syntactic role can be realized by the head NP within the subordinate relative clause). While in absolute terms, languages do differ, Keenan and Comrie were able to create a scale, such that if some language allows the formation of relative clauses, for example, on direct objects (as in a) then it necessarily allows relative clauses on subjects (as in b):[18]

28. a. MARILYN: And I see this girl,
Who I'd never seen before (SBC: 003).
28. b. MILIES: I meet this psychotherapist.
... Who tells me (SBC: 002).

Indeed, it is quite rare to find a language which would allow relative clauses such as the one on *this girl* but would block relative clauses such as the one on *this psychotherapist*. The distribution of resumptive pronouns in relative clauses is also universally and similarly restricted. For example, whereas the Hebrew translation of the direct object relative clause in 28(a) may contain a resumptive pronoun (as in 29(a)), the one in 28(b) (as in 29(b)) absolutely cannot:

29. a.	~ani	roe	et	ha=yalda	ha=zu		she=af paam	lo	raiti
	I	see	ACC	this girl			that=never	not	I.saw
	(**ota**)	kodem. ('I see this girl that I'd never met **her** before')							
	(her)	before.							
29. b.	~	ani	pogesh	et	ha=psixologit	ha=zu	she=***hi**		omeret li...
		I	meet	ACC	this psychotherapist		that=she		tells me...

And, as we've mentioned above, we can identify a prevalent grammatical pattern of verbal person agreement, such that if a language has verbal person agreement for some but not all persons, it is first and second persons that exhibit agreement, rather than only third, or only first and third, or only second and third. In other words, grammars do not vary freely. There are definitely universal tendencies.

Finally, grammars of languages all over the world do seem to have evolved out of salient discourse patters. They are far from arbitrary (in line with (b) above). We have already discussed the prevalent verbal person agreement marking (overt markers only for first and second persons), which can be motivated by reference to universally attested discourse patterns. As mentioned above, it is the speech participants (but not the non-participating third persons) that are consistently

highly accessible and hence phonetically reducible to the point where they merge with the verb. The same applies to the consistently zero verbal agreement for the absolutive (the argument that has less of a chance to reduce phonetically). The very structured restrictions on relativization, as well as on the distribution of resumptive pronouns, are also motivated in that syntactic positions lower on the hierarchy introduce processing difficulties. Hence the tendency not to form such relative clauses.[19] The prototypical discourse profile of possessed NPs is also responsible for the prevalent grammatical pattern banning the co-occurrence of both a possessive marker and a definite article. As Haspelmath argues, since possessed NPs overwhelmingly stand for identifiable discourse entities, overtly marking them as such (by the definite article) is redundant. Addressees expect to be able to identify such discourse entities, and hence, do not need an explicit linguistic indicator for that purpose.

Still, none of the predictions we enumerated above is totally and absolutely realized in all natural languages. Not all discourse patterns are identical cross-linguistically, not all aspects of grammar can be analyzed as functionally motivated, and certainly many grammatical aspects are not universal. For example, contra (a), not all discourse patterns are identical. Whereas English tends to use *can you* questions as requests, Hebrew prefers the counterpart of 'are you ready' requests. In addition, only Hebrew consistently uses the counterpart of 'if you don't mind' and 'if it's not difficult for you' for forming polite (but not super polite) requests. Contra (c), not all grammars are identical. For example, there are languages which do allow the co-occurrence of a definite article with a possessive construction. Not all languages have person verbal agreement, although the expectation is that first- and second-person referents are universally consistently highly accessible, and some languages are ergative, while others are accusative. Similarly, although PAS patterns has been observed in many unrelated languages, only Aguacatec seems to have grammaticized the no New Agent constraint. If so, (b) cannot be invariably true either. For example, if contra the discourse motivation behind the reduction of references to first- and second-person referents, many languages never develop verbal person agreement inflections and there is some arbitrariness as to which discoursal patterns turn grammatical. Worse than that, if contra the discourse motivation for economy (anti-redundancy), some possessive constructions allow definiteness marking, then some pieces of grammar may seem unmotivated.

We cannot properly address these serious challenges in this article (but see Ariel, 2008). But to give a flavor of the kinds of answers we can provide for these problems, consider the following. First, there's a crucial difference between a motivated association between discourse patterns and grammar and a necessary association. While the creation of first- and second-person verbal agreement (out of independent pronouns) is motivated, it is not necessary. Not all discourse patterns evolve into grammatical conventions in all languages. Second, interlocutors often face competing motivations (Du Bois, 1985). If one motivation may lead to one pattern of grammaticization while another might lead to a different pattern of grammaticization, it is only natural to find that some languages go one way and others go another. This is how Du Bois accounts

for the rise of ergative and accusative grammars out of very similar discourse patterning. He suggests that since both transitive and intransitive subjects tend to be topical, classifying them together grammatically is highly motivated. This is the accusative grammatical pattern. At the same time, since both intransitive subjects and direct objects do not invariably stand for highly accessible entities, this feature distinguishes the two from transitive subjects, and serves as the basis for the ergative grammatical pattern.

Regarding definiteness marking in possessive NPs, argues Haspelmath, a motivation competing with economy is the drive for explicit and perfectly consistent marking. This motivation predicts that once some language overtly marks definiteness, it should do so consistently for all definite NPs, possessed ones included. Indeed, in Brazilian Portuguese, for example, the counterpart of 'the my friends' is grammatical; and in Hebrew we have two alternatives for saying, for example, 'my daughter', one which prohibits the use of a definite article and one which makes it obligatory.[20] Given that discourse is rife with potentially competing motivations, which in turn trigger conflicting discourse patterns, we can understand why some arbitrariness is observed in discourse/grammar associations. An important point to bear in mind, however, is that by no means is it the case that 'anything goes'. There are very severe restrictions on which grammatical conventions may evolve, and researchers are sometimes even able to predict which motivation will prevail in cases of competition. For example, Haspelmath convincingly argues that should the development of the possessive construction predate the development of a definite marker, zero definiteness is expected (because definiteness is consistently inferable based on the fact that the discourse entity is presented as possessed). But if the definite marker predates the possessive marker, then marking possession is not redundant for definite NPs (the inference 'if definite then possessed' is not strong at all) and co-occurrence of the two linguistic markers may be legitimate. This is precisely the case for the two Hebrew alternative possessive constructions.[21]

All in all, discourse patterns are functionally motivated, as is the association between discourse patterns and grammatical conventions. Nonetheless, grammatical systems are not identical. The point of section 4 is that differences among languages are heavily restricted. Grammatical conventions emerge out of motivated discourse functions, but first, there is no one-to-one association between interactional motivations and discourse patterns. For example, in order to express a polite request (one function) it is equally reasonable to ask the addressee whether he is capable of complying with the request as it is to ask him whether he is ready to comply with it (each creating a distinct discourse pattern). Competing motivations, each functionally justified (e.g. economy versus explicit and consistent marking), also explain why not all grammatical conventions reflect a single motivation. The general picture is that the relationship between salient discourse patterns and grammar is motivated but it is neither necessary nor simple. This is why, for example, although the discourse patterns and processes behind the use of I *think* expressions in Hebrew and English are similar, not all grammatical consequences are identical. Both languages allow for the transportation of the epistemic phrase to various

non-sentence-initial positions, but only Hebrew created a special inflection forms for first person 'I think'.

5. Conclusions

While acknowledging that many discourse principles are inherently different from grammatical conventions, this overview concentrated on the commonalities and the meeting points between discourse and grammar. The first point (section 1) was that some principles apply both in the grammar (within the sentence) and in the discourse (cross-sententially). The other points all concerned feed-back relations between discourse, or rather, salient (recurrent) discourse patterns and grammatical conventions. We reviewed phonetic, phonological, morphological syntactic and semantic phenomena, all manifesting an intimate relationship with motivated and consistent discourse patterns. Our second point was that a very careful selection process mediates between grammar and actual language use (section 2): speakers choose from among grammatical alternatives those that best serve their communicative (and other) purposes in the specific discourse they are currently engaged in. The third point was that another selective process links discourse products and grammatical conventions (section 3): salient discourse patterns associating between specific forms and specific functions serve as raw material for grammar in the making. Grammar evolves out of highly motivated salient discourse patterns, then. Our final point was that although there's an intimate relationship between discourse and grammar, the relation is not absolutely transparent, invariant or simple. Neither is it necessary. It is therefore not uncommon to find that what is merely a discourse pattern in one language is a grammatical convention in another.

NOTES

1. I thank Jack Du Bois for comments and suggestions for this paper.
2. SBC is the Santa Barbara Corpus of Spoken American English (Du Bois and Englebretson, 2004, 2005; Du Bois et al., 2000, 2003a). The transcription conventions applicable to the examples cited are:

Symbol:	Meaning:
New line	A new Intonation Unit
.	Final intonation
,	Continuing intonation
?	Appeal/question intonation
...	Pause (medium or long)
..	Pause (short)
[ ]	Overlapping/simultaneous speech
(H)	Breathe (in)
<VOX>	Voice of another
d-	truncated/cut-off word (en dash)

LSAC is the Longman Corpus of Spoken American English.

3. ~ indicates a constructed example.
4. Thompson (2002) herself argues that the complement in such cases is not syntactically subordinate, but see Boye and Harder (2007) and Newmeyer (2008) for counter-arguments.
5. The data considered comprise the first 200 cases of non-passive *met* (*with*) in LSAC.
6. Note that as such, PAS constraints provide another example for our point in section 1, that discourse principles may apply within the sentence.
7. Note that the constraint is discoursal and not grammatical because it does not apply in 100 percent of the cases. Grammatical rules (e.g. verbal agreement) don't really ever apply in 100 percent of the cases either. Rather, it is because the violation of the principle, as in 7(f), does not create an intuition of ungrammaticality. Grammatical violations, such as agreement errors do.
8. The above findings are based on a Webcorp search (3 May 2008), hence the cautious phrasing.
9. See Du Bois (2008) for why there are relatively many transitive subjects for a verb such as *boo*.
10. The picture is slightly more complicated, because not all processes were affected by all factors, and there is a difference in the rate of reduction for *t* versus *d*. Most intriguingly, unlike phonetic shortening, deletion was less, rather than more, likely when the word token occurred in a semantically related context. But these facts do not alter the general, very strong case that Gregory et al. (1999) present.
11. Bybee (2006), on the other hand, emphasizes the neuromotor routines established for repeated use of frequent words and collocations, which renders execution more efficient, the articulatory gestures reducing and overlapping. Note that the two explanations are perfectly compatible with each other, Bybee focusing on the speaker, Gregory et al. on the addressee.
12. Out of 18 non-truncated initial *can you* utterances in SBC, 11 constituted requests.
13. Of course, the sentence is appropriate under different circumstances, where readiness is at issue.
14. 18(a) provides us with another example of the conventionality of language use, despite the freedom of grammatical combinations. Note that where Hebrew speakers talk about 'forming connection', English speakers refer to the same event as *get in touch*. Just as ~??*Form connection* is ill-formed in English, so is the Hebrew counterpart of *get in touch* ~?? *haseg maga* almost incomprehensible.
15. The other 42 verbs constituted 35 percent of the occurrences.
16. Other persons here exclude *you*.
17. An additional person distinction (first and second versus third) may be evident here too.
18. Note that within the relative clause, the relativized position of the head NP *this girl* is direct object, whereas that of *this psychotherapist* is subject.
19. See Ariel (1999) for the motivation behind the selective use of resumptive pronouns in relative clauses.
20. The inflected *yaldat.i* 'my girl' excludes a definite article (cf. **ha* = *yaldat.i*), whereas the analytic *ha=yalda shel.i* 'the child of me' requires it (cf. **yalda shel.i* 'child of me').
21. The inflected possessive forms are older than the analytic forms.

REFERENCES

Ariel, M. (1990) *Accessing Noun-Phrase Antecedents*. London: Routledge.

Ariel, M. (1998) 'Three Grammaticalization Paths for the Development of Person Verbal Agreement in Hebrew', in J.-P. Koenig (ed.) *Discourse and Cognition: Bridging the Gap*, pp. 93–111. Stanford, CA: CSLI Publications.

Ariel, M. (1999) 'Cognitive Universals and Linguistic Conventions: The Case of Resumptive Pronouns', *Studies in Language* 23: 217–69.

Ariel, M. (2000) 'The Development of Person Agreement Markers: From Pronouns to Higher Accessibility Markers', in M. Barlow and S. Kemmer (eds) *Usage-Based Models of Language*, pp. 197–260. Stanford, CA: CSLI Publications.

Ariel, M. (2008) *Pragmatics and Grammar*. Cambridge: Cambridge University Press.

Ariel, M. (forthcoming) *Defining Pragmatics*. Cambridge: Cambridge University Press.

Benveniste, E. (1971) *Problems in General Linguistics*. Coral Gables, FL: University of Miami Press.

Bod, R. (1998) *Beyond Grammar: An Experience-Based Theory of Language* (CSLI Lecture Notes 88). Stanford, CA: CSLI Publications.

Bod, R. (2005) 'Exemplar-based Syntax', paper presented at the 2005 LSA meeting, Oakland, CA, USA.

Boye, K. and Harder, P. (2007) 'Complement-Taking Predicates: Usage and Linguistic Structure', *Studies in Language* 31: 569–606.

Bybee, J.L. (1999) 'Usage-Based Phonology', in M. Darnell, E.A. Moravcsik, F.J. Newmeyer and K.M. Wheatley (eds) *Functionalism and Formalism in Linguistics Volume I: General Papers*, pp. 211–42. Amsterdam: John Benjamins.

Bybee, J.L. (2000) 'The Phonology of the Lexicon: Evidence from Lexical Diffusion', in M. Barlow and S. Kemmer (eds) *Usage-Based Models of Language*, pp. 65–85. Stanford, CA: CSLI Publications.

Bybee, J.L. (2001) *Phonology and Language Use* (Cambridge Studies in Linguistics 94). Cambridge: Cambridge University Press.

Bybee, J.L. (2002) 'Sequentiality as the Basis of Constituent Structure', in T. Givón and B.F. Malle (eds) *The Evolution of Language Out of Pre-Language*, pp. 109–34. Amsterdam: John Benjamins.

Bybee, J.L. (2006) 'From Usage to Grammar: The Mind's Response to Repetition', *Language* 82: 711–33.

Delong, K.A., Urbach, T.P. and Kutas, M. (2005) 'Probabilistic Word Pre-Activation during Language Comprehension Inferred from Electrical Brain Activity', *Nature Neuroscience* 8: 1117–21.

Du Bois, J.W. (1985) 'Competing Motivations', in J. Haiman (ed.) *Iconicity in Syntax*, pp. 343–65. Amsterdam: John Benjamins.

Du Bois, J.W. (1987) 'The Discourse Basis of Ergativity', *Language* 63: 805–55.

Du Bois, J.W. (2003) 'Discourse and Grammar', in M. Tomasello (ed.) *The New Psychology of Language: Cognitive and Functional Approaches to Language Structure*, vol. 2, pp. 47–87. Mahwah, NJ: Lawrence Erlbaum Associates.

Du Bois, J.W. (2008) 'Cognitive Containment and the Emergence of Complexity: Grammaticizing the Ditransitive Construction', paper presented at New Reflections on Grammaticalization, Leuven, Belgium.

Du Bois, J.W. and Englebretson, R. (2004) *Santa Barbara Corpus of Spoken American English, Part 3*. Philadelphia: Linguistic Data Consortium, University of Pennsylvania.

Du Bois, J.W. and Englebretson, R. (2005) *Santa Barbara Corpus of Spoken American English, Part 4*. Philadelphia: Linguistic Data Consortium, University of Pennsylvania.

Du Bois, J.W., Chafe, W.L., Meyer, C. and Thompson, S.A. (2000) *Santa Barbara Corpus of Spoken American English, Part 1*. Philadelphia: Linguistic Data Consortium, University of Pennsylvania.

Du Bois, J.W., Chafe, W.L., Meyer, C., Thompson, S.A. and Martey, N. (2003a) *Santa Barbara Corpus of Spoken American English, Part 2*. Philadelphia: Linguistic Data Consortium, University of Pennsylvania.

Du Bois, J.W., Kumpf, L.E. and Ashby, W.J. (eds) (2003b) *Preferred Argument Structure: Grammar as Architecture for Function*. Amsterdam: John Benjamins.

Giora, R. (1985) A Text-Based Analysis of Non-Narrative Texts', *Theoretical Linguistics* 12: 115–35.

Giora, R. (2003) *On Our Mind: Salience, Context, and Figurative Language*. New York: Oxford University Press.

Greenberg, J.H. (1966) *Language Universals, with Special Reference to Feature Hierarchies*. The Hague: Mouton.

Gregory, M.L., Raymond, W.D., Bell, A., Fosler-Lussier, E. and Jurafsky, D. (1999) 'The Effects of Collocational Strength and Contextual Predictability in Lexical Production', paper presented at Chicago Linguistics Society, Chicago, IL.

Grice, H.P. (1989) *Studies in the Way of Words*. Cambridge, MA: Harvard University Press.

Haspelmath, M. (1999) 'Explaining Article-Possessor Complementarity: Economic Motivation in Noun Phrase Syntax', *Language* 75: 227–43.

Haspelmath, M. (2006) 'A Review of John W. Du Bois, Lorraine E. Kumpf, and William J. Ashby eds. Preferred Argument Structure: Grammar as Architecture for Function', *Language* 83: 908–12.

Hooper, J.B. (1976) 'Word Frequency in Lexical Diffusion and the Source of Morphophonological Change', in W. Christie (ed.) *Current Progress in Historical Linguistics*, pp. 96–105. Amsterdam: North-Holland.

Keenan, E.L. and Comrie, B. (1977) 'Noun Phrase Accessibility and Universal Grammar', *Linguistic Inquiry* 8: 63–99.

Kuno, S. (1975) 'Three Perspectives in the Functional Approach to Syntax', in R.E. Grossman, L.J. San and T.J. Vance (eds) *Papers from the Parasession on Functionalism*, 1st edn, pp. 276–336. Chicago, IL: Chicago Linguistic Society.

Larsen, T.W. (1981) 'Functional Correlates of Ergativity in Aguacatec', paper presented at Berkeley Linguistics Society, Berkeley, CA.

Levinson, S.C. (2000) *Presumptive Meanings: The Theory of Generalized Conversational Implicature*. Cambridge, MA: MIT Press.

Mann, W.C. and Thompson, S.A. (1988) 'Rhetorical Structure Theory: Toward a Functional Theory of Text Organization', *Text* 8: 243–81.

Newmeyer, F.J. (2008) 'What Conversational English Tells Us about the Nature of Grammar: A Critique of Thompson's Analysis of Object Complements', University of Washington, University of British Columbia, and Simon Fraser University.

Siewierska, A. (2004) *Person*. Cambridge: Cambridge University Press.

Sperber, D. and Wilson, D. (1986/1995) *Relevance*. Oxford: Blackwell.

Thompson, S.A. (2002) '"Object Complements" and Conversation towards a Realistic Account', *Studies in Language* 26: 125–63.

Thompson, S.A. and Mulac, A. (1991a) 'A Quantitative Perspective on the Grammaticization of Epistemic Parentheticals in English', in *Approaches to Grammaticalization*, II, pp. 313–29. Amsterdam: John Benjamins.

Thompson, S.A. and Mulac, A. (1991b) 'The Discourse Conditions for the Use of the Complementizer *That* in Conversational English', *Journal of Pragmatics* 15: 237–51.

Trueswell, J.C., Tanenhaus, M.K. and Garnsey, S.M. (1994) 'Semantic Influences on Parsing: Use of Thematic Role Information in Syntactic Disambiguation', *Journal of Memory and Language* 33: 285–318.

Van Dijk, T.A. (1972) *Some Aspects of Text Grammars* (Janua Linguarum, Series Maior 63). The Hague: Mouton.

Van Dijk, T.A. (1977) *Text and Context: Explorations in the Semantics and Pragmatics of Discourse*. London: Longman.

Zipf, G.K. (1929) 'Relative Frequency as a Determinant of Phonetic Change', *Harvard Studies in Classical Philology* 15: 1–95.

MIRA ARIEL is Professor of Linguistics at Tel Aviv University. Her research focuses on cognitive explanations for language use and grammar (*Accessing Noun Phrase Antecedents*, 1990) and the interface between grammar and pragmatics (*Pragmatics and Grammar*, 2008; *Defining Pragmatics*, forthcoming). ADDRESS: Tel Aviv University, Tel Aviv, 69978, Israel. [email: mariel@post.tau.ac.il]