

more advanced techniques in the statistical analysis. On the other hand it is also possible to skip the more technical sections of part II of the book and turn straight to the interpretation of the results in part III, as the reader is indeed encouraged to do (25).

In an appendix, Biber includes brief accounts of the algorithms used to search for every single one of the 67 linguistic features. This leaves him open to attack because a close scrutiny of these algorithms reveals that some short cuts were necessary in order to obtain more or less reliable results, as pointed out above with the example of the place adverbials. But the openness makes the book all the more valuable because it allows a fair assessment of what his figures actually mean, and it indicates where the need for further work is most pressing. The appendix also includes large lists of mean frequencies for all features in each of the 23 genres, and the Pearson correlation coefficients for all the linguistic features. However, if these lists are to be used for comparative purposes, considerable caution is called for, and it seems advisable to check Biber's recognition algorithm very carefully to ensure that the comparison compares like with like.

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Maria Luisa Zubizarreta, *Levels of representation in the lexicon and in the syntax*. Dordrecht: Foris, 1987. Pp. vi + 198.

Zubizarreta's book is set against the background of Chomsky's Government and Binding theory as outlined in Chomsky (1981), and the author relies heavily on modifications to that theory introduced by Williams and van Riemsdijk (1981). I shall not repeat the basic tenets of the theory here, assuming that the reader is familiar with them. The main purpose of my review is rather to offer a general overview of Zubizarreta's own account and to raise a number of general questions.

As the title of the book indicates, the focus of Zubizarreta's interest is levels of representation, and her major modification concerns the role of the lexicon in determining syntactic structure. Essentially, the idea is that not only are there different levels of representation in the syntax, but this proposal must be extended to the lexicon, where she also posits two levels of representation:

- (I) (i) S-R: the lexico-semantic level
- (ii) L-R: the lexico-syntactic level

S-R encodes ‘selectional properties of a lexical item’ (3) and ‘consists of a set of structured predicate argument relations’ (7). This proposal differs from the standard lexical representations in work in the GB tradition, where lexical information is usually represented in terms of unordered thematic relations. S-R representations apply to the lexical categories verb, adjective, noun and preposition. The distinction between what are usually referred to as external arguments as opposed to internal arguments (see Williams, 1981, for this distinction) is captured by means of ‘scope relations’, which correspond closely to the standard notion of government: the internal argument is within the scope of a predicate, the external argument is outside its scope. Transitive, intransitive and unaccusative or ergative verbs have the following representations at the level of S-R:

(2) (a) Transitive verbs:



(b) Intransitive verbs:



(c) Unaccusative verbs:



P stands for the Predicate, i.e. the verb, and *x* and *y* are argument variables selected by the predicate.

In (2a) and (2b) we see that transitive and intransitive verbs take one external argument (*x*), which is outside the scope of P. Both transitive and unaccusative verbs have an internal argument variable (*y*), as seen in (2a) and (2c). Zubizarreta’s assumption is that ‘substantive notions like *theme*, *patient*, *goal*, *experiencer* have no grammatical importance: rules and principles of grammar are never formulated in terms of these notions’ (12). However, the author further specifies that ‘the claim that thematic roles are not grammatically relevant features does not mean that there are no substantive semantic categories which are operative in the grammar’ (12). I return to this issue below.

The lexical information contained in the S-R representations is not mapped directly onto syntactic representations. The lexico-syntactic level

(L-R) is the intermediate level between S-R and the syntax. It specifies, among other things, the categorial nature of the syntactic category onto which argument variables are mapped. Linking rules ensure that S-R representations are mapped onto L-R representations:

(3) Core Linking rules:

If a predicate P is projected onto a position H in the lexical frame, then

- A. Link the internal arg-variable of P to a position governed by H. (Rule of Projection)
- B. Link the external arg-variable of P to the head of the lexical frame. (Rule of L-predicate Formation.)

Default Linking Rule:

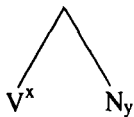
- C. If B does not apply, then copy the index of the argument governed by the head of the lexical frame onto the head of the lexical frame (Default Rule of L-predicate Formation). (15).

Although such rules may at first look dramatically different from the standard rules of Projection in GB, an example will suffice to illustrate that they are to a large extent notational variants, with some differences, though, to which I return. Take, for instance the verb *put*, with the S-R in (4):

(4) *put*: put y, x; Loc P z.

According to Core Linking rule A the internal argument of *put* will be headed by N, hence an NP, and governed by the verb at L-R. The index of the external argument will be linked to the head of the lexical frame:

(5) *put*:



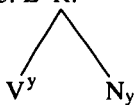
The question then arises how the external argument (*x*) is going to be projected. In order to obtain a full predicate argument structure the argument variable *x* is copied onto the mother node of the argument structure, which will create an open predicate. Such an open predicate P is interpreted via predication: P will have as its sister a category C with its own index and the variable *x* borne by the open predicate will be identified with *i*. In (5) the index *x* of the external argument of *put* will thus be equated with the index of an NP in subject position.

So far, the representations obtained through Zubizarreta's system of projection will not differ very much from standard representations. An important difference arises, though, with respect to unaccusative verbs like *arrive*. In the GB framework the assumption is that such verbs give rise to the

D-structure and S-structure representations in (6a) and (6b) respectively. The S-structure is derived via NP movement of the internal argument of *arrive*:

- (6) (a) [_{IP} e ed [_{VP} arrive John_i]]
 (b) [_{IP} John_i ed [_{VP} arrive t_i]]

In Zubizarreta's theory, unaccusative verbs, which have only an internal argument, are subject to rule (3B) and default linking rule (3C). Given that unaccusative verbs lack an external argument, the index of the internal argument will be projected onto the head of the predicator frame and create an open predicate to be interpreted by predication:

- (7) *arrive*: L-R:


This representation will result in a type of binding relation where an empty position N_y is linked via predication to a position outside the verb projection:

- (8) (Zubizarreta's 1.12):
 [_S [_{NP_j} The man_j] [_{VP_y} arrived] e_y yesterday]
 Y = j by Predication.

This means that NP-movement has become redundant and that the level of syntactic representation as determined by Zubizarreta's L-R is not to be equated with the standard D-structure of GB theory, but rather with that of NP-structure as in van Riemsdijk & Williams (1981). *Wh*-movement then applies to this level of representation to generate S-structure.

An immediate question is how this system deals with NP movement in the case of raising predicates. In such examples NP-movement is non-local: the subject of the lower clause is moved to the subject position of the dominating verb.

- (9) (a) John_i seems [t_i to be ill]
 (b) John_i seems [t_i ill]
 (c) John_i seems [t_i a nice guy]
 (d) John_i seems [t_i out of his mind.]

I refer the reader to a detailed discussion of the analysis of raising predicates in Zubizarreta's own work (17–21). She proposes that in order to capture the non-local nature of the binding relation between *John* and the subject position of the lower predicate it suffices to assume that the internal clausal argument of *seem* is a projection of Infl. The head of the Infl-projection is

coindexed with its subject via agreement, thus the index of the head of the complement of *seem* in (9a) will be that of the subject of the lower clause. By the default linking rule (3C) this index will be copied to the *seem* itself and will be percolated to the VP headed by *seem*, creating an open predicate whose index will have to be identified with the index of the subject NP by the rule of Predication. Zubizarreta argues that the same mechanism can be applied to small clauses headed by Adjectives such as (9b), since there too one can argue that the subject of the predicate *ill* agrees with the adjective. She posits that adjectives are ‘composite categories’ of the type $\langle A \text{ AGR}_y \rangle$, where y stands for the lexical index of the NP with which the adjective agrees’ (20). This seems quite a natural assumption to make and one that can presumably extend to small clauses headed by NP predicates as in (9c). However, it is not immediately clear to me whether the proposal can also extend to small clauses with Prepositional phrases as their predicates as in (9d). It seems far less natural to argue that PPs are also composite categories containing AGR.

Zubizarreta herself says very little about the projection of the non-lexical categories I and C, treating them as is now standard in the *Barriers* framework (Chomsky, 1986) (see her brief discussion on pp. 17–18). She seems to assume that they have no place in the lexical levels of representation. It would be interesting to see how IP and CP projections are determined. For instance one may wonder how to interpret the selectional properties of INFL and COMP, if they are not lexical. Another point that may be raised concerns the status of external argument of verbs. In the recent literature it has been proposed (see for example Sportiche, 1988) that the external argument of a verb is not projected directly onto the subject position, but is base generated in the specifier of VP. (10a) will have the underlying structure (10b):

- (10) (a) $[_{IP} [_{NP}_i \text{ John}] [_I \text{ ed}]] [_{VP} [_{NP} t_i \text{ buy a house}]]$
 (b) $[_{IP} [_{NP} e]] [_I \text{ ed}]] [_{VP} [_{NP} \text{ John}]_i \text{ buy a house}]$

In this view NP movement is generalized to all VP patterns. One way of capturing this proposal in Zubizarreta’s theory would be to say that all arg variables have to be linked to a position governed by the verb (see 3A).

On the basis of the first chapter Zubizarreta then shows how the system she develops applies in different areas of syntax. Chapter 2 (39–81) offers a discussion of the lexical and syntactic representation of NPs. The main tenet of this chapter is that NPs are mapped directly from S-R to the syntax. In other words, there is no intermediate level of mapping of L-R, and hence, she argues, there are no NP-trace effects in NPs. This perhaps controversial statement is backed up by detailed discussion of English and Romance NPs. Chapter 3 (87–131) discusses lexical processes, i.e. processes that operate on S-R representations. These include the formation of adjectival and verbal

passives (94–107) and the formation of causatives and anti-causatives (87–92 and 107–119). It is in this chapter that we return to the substantive notions such as CAUSE and STATE. For instance, anti-causativization consists in the deletion of the CAUSE feature of a predicate. Causative *sink* would have S-R (11a) and anti-causative *sink* (11b):

- (11) (a) S-R < < CAUSE *sink* > y >, x
 (b) S-R < *sink* z >

Zubizarreta says ‘the absence of the causative relation entails the absence of a “causer”’ (88). Intuitively, this proposal makes sense. Note, though, that features such as CAUSE and STATE – which is introduced with respect to adjectival passives – have at the moment not much conceptual content in the theory. While I sympathize entirely with Zubizarreta’s proposal to get rid of the use of substantive notions such as theme and the like in the syntax, it seems rather undesirable to introduce another set of terms which at this point are equally unclear. The term STATE in itself raises the question of its interaction with the aspectual notion of statives. Similarly Tenny’s work (1987) on the interaction of aspect and thematic roles shows the relevance of the notion affectedness for aspectual notions and in unpublished work Rose Morris (1984) has argued for an interaction between the thematic level and the aspectual level. It would be interesting to see how substantive terms such as those advocated by Zubizarreta can be given content. In Chapter 4 Zubizarreta deals with semantic and syntactic verbal operators (133–184) and discusses in detail the case of English middles and Romance *se*.

In each of the empirical domains treated Zubizarreta pays a lot of attention to description of the data and shows how her theory can account for them. It is rather regrettable, though, that she pays relatively little attention to a detailed discussion of the recent treatments of such topics in GB work. To give but one example, Jaeggli’s recent treatment of passives (1986) is dispensed with in a footnote (128). Roberts’ work on passive, which offers proposals similar to Jaeggli’s and extends to the treatment of middles is also highly relevant here but given that the latter was published only in 1987 it is, of course, quite understandable that Zubizarreta does not include it in her discussion. Since Zubizarreta’s rather elaborate system of lexical representations is intended to do the same work as standard GB proposals, which after all do look rather less complex, a more detailed account of the merits of her own proposal would have made the book more attractive to the general reader. In conclusion, it seems to me that this book will mainly be of interest to the specialist in the GB literature, who will find here some interesting modifications in the theory and to those working on the specific empirical problems dealt with. However, I am not entirely sure that readers will find compelling arguments to adopt Zubizarreta’s theory for their own future work.

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Henry Hoenigswald and Linda F. Weiner (eds), *Biological metaphor and cladistic classification: an interdisciplinary approach*. London: Frances Pinter, 1987. Pp. xii + 286.

In recent times neighbouring disciplines have often drawn on linguistics as a model: one has only to think of the various 'structuralisms' in anthropology and literary theory. In the nineteenth and earlier twentieth centuries it was rather the reverse: the younger and less confident linguistics sought to validate its status as a science by seeking common imagery (if not common theory) with the harder sciences. This is evident in the parallels drawn by nineteenth-century comparativists like Bopp between their work and Cuvier's *anatomie comparée*, Schleicher's 'Darwinism', and the like. Regardless of direction of influence, when two disciplines face, or appear to face, similar problems, or to deal with related subjects (e.g. phylogenetic classification, as in evolutionary biology and historical linguistics), mutual discussion of procedures and theory is likely to be enlightening. This is especially the case if one of them is actively involved in foundation studies in some area while the other is not: as in historical biology, which since the 'cladistic revolution' sparked by Hennig (1966) has been deeply involved in the theory of stemmatics, while historical linguistics, except for some pioneering and rather solitary workers like Hoenigswald in his famous *Language change and linguistic reconstruction* (see also Hoenigswald, 1973) and the somewhat problematic tradition exemplified by lexicostatistics (see below), generally has not. Since both subjects are concerned with stemmatics in the widest sense ('real' filiations, the construction of phylogenetic trees), any possible *rapprochement* between their methodologies and theoretical concerns may be