A Syntax of Substance

David Adger

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Series Foreword

We are pleased to present the sixty-fourth in the series *Linguistic Inquiry Monographs*. These monographs present new and original research beyond the scope of the article. We hope they will benefit our field by bringing to it perspectives that will stimulate further research and insight.

Originally published in limited edition, the *Linguistic Inquiry* Monographs are now more widely available. This change is due to the great interest engendered by the series and by the needs of a growing readership. The editors thank the readers for their support and welcome suggestions about future directions for the series.

Samuel Jay Keyser
for the Editorial Board

Preface

This book arose because two shorter papers I was working on separately wouldn't leave each other alone. One was to be an attempt at defending and analyzing a new crosslinguistic generalization (PP Peripherality: PP complements are always more peripheral to their noun heads than adjectives). The other was to be a theoretical solution to a problem of phrase structure theory (how to label specifier–head structures) that had the added consequence of ruling out roll-up and remnant roll-up derivations. However, it became clear to me that the theoretical article needed an in-depth case study of a particular domain to give it bite, whereas the more empirical paper relied heavily on theoretical proposals articulated in the other article. Each needed to be complemented with the other. However, doing that would have led to far too many words for any self-respecting journal editor to accept. I hope, however, that the result makes for a reasonable read in book form.

The book, of course, is longer than I had planned, but it is also far too short in that it leaves many questions open. I have not touched on clausal complements to nouns (but see Moulton 2009 for a proposal that fits well with the system developed here) nor on analyses of complementation that treat it as relativization (Arsenijević 2009; Kayne 2010), and although the discussion of head-initial languages has some depth, there is still much work to do on the realization of nominal relations in head-final (and Ezafe) languages. I have also left aside much of the literature that takes certain nominal relations to be, at heart, a form of predication (den Dikken 2007a; Boneh and Sichel 2010). Furthermore, I only briefly touch on event nominalizations, which have generated a huge literature in the history of generative grammar, choosing to focus instead what Barker and Dowty (1993) call "ultra-nominal" nouns.

The material presented here, has, in various incarnations, been presented at the following venues, and I'd like to thank the participants for helpful and stimulating feedback: the LISSIM Summer School, Kausani, Uttarachand (2009); the 6th Celtic Linguistics Conference, Dublin (2010); the Comparative Germanic

Syntax Workshop, Tromsø (2010); the MIT Colloquium (2011); and Richie Kayne's Advanced Syntax Seminar, New York University (2011), as well as at seminars and colloquia at the University of Tromsø, the University of Cambridge, Boğaziçi University, and of course presentations at Queen Mary's Syntax Semantics Research Group (thanks here, especially, to Hagit Borer, Paul Elbourne, Daniel Harbour, Luisa Martí, and Linnaea Stockall). I would also like to thank the following people for discussions about the ideas, or, indeed, for comments on written drafts: two anonymous referees for the MIT Press, Klaus Abels, Chris Barker, Hagit Borer (again), Dirk Bury, Terje Lohndal, Daniel Harbour (again), Gillian Ramchand, and especially Peter Svenonius for some detailed comments on a last-minute draft.

For linguistic aid, many thanks to: Iseabail NicIlleathainn, Iain MacLeòid, Murchadh MacLeòid, Boyd Robasdan, and Marion NicAoidh (Gaelic) and Mark Wringe and Sìlas Landgraf and the staff and students of Sabhal Mòr Ostaig, Isle of Skye, for data-gathering advice and help; 'Ōiwi Parker Jones (Hawaiian); Peadar Ó Muircheartaigh (Irish); Maria Arché, Luisa Martí, and Álvaro Recio Diego (Spanish); Chiara Ciarlo, Roberta d'Alessandro, and Vieri Samek-Lodovici (Italian); Erez Levon and Itamar Kastner (Hebrew); Issa Razaq and Abdul Gad-alla (Arabic); Øystein Nilsen and Kristine Bentzen (Norwegian); Shiti Malhotra (Hindi); Meltem Kelepır (Turkish); Tanmoy Bhattacharya (Bangla); Mythili Menon and Parvati Nair (Malayalam); Itziar Laka and Marta Uzchanga (Basque); Kaori Takamine (Japanese); Éva Dékány (Hungarian); Deepak Alok Sharma (Angika); and Anson Mackay (English).

Thanks also to Anson for putting up with my linguistics obsessions for 25 years!

For caffeinic assistance (at times, subsistence), thanks to @NudeEspresso on Hanbury Street, Spitalfields, for an endless supply of flat whites.

The core empirical work on Gaelic that is reported here was undertaken during a Leverhulme Major Research Fellowship, for which I am extremely grateful.

Finally, a word on the title. I propose in this book that the apparent relationality of nominals does not inhere in the nominal itself but rather in higher structure. This means that nouns are never relations; they simply denote undifferentiated substance. In terms of Aristotle's *Categories*:

> Moreover, primary substances are most properly called substances in virtue of the fact that they are the entities which underlie everything else, and that everything else is either predicated of them or present in them. (Aristotle, *Categories* 1.5)

It is in this Aristotelian sense that I mean "substance" here, with no claims about issues such as the mass/count distinction, which the book does not touch on.

Chapter 1

Introduction

The aims of this book are to develop a syntactic system that entirely separates structure building from the labeling of structure and to examine the theoretical, and some of the empirical, consequences of this idea.

The primary reason to explore such a system comes from a number of problems that arise in the Bare Phrase Structure approach to syntactic representation (Chomsky 1995b). In Bare Phrase Structure, labeling is a side effect of the structure-building operation Merge: when two elements X and Y are Merged, creating a new syntactic object, one of these elements is chosen to be the label.

However, this raises the question of how to choose the label. There are a number of possible approaches in the literature, but none of these is entirely satisfactory. I argue in chapter 2 that they all have problems in providing a unified labeling algorithm, especially when specifier–head structures are considered.

The alternative solution I propose builds on the idea that there are actually no true functional heads qua lexical items. Rather structure is always built from lexical roots via Self Merge or standard binary Merge, where Self Merge is just the subcase of binary Merge where both inputs to the operation are token identical. The structures so built are directly labeled on the basis of a (set of) universal sequences of functional categories (roughly equivalent to the extended projections of Grimshaw 1991). That is, Self Merged roots are labeled with the start of some extended projection, and then that structure undergoes further structure-building operations. Each new structure is built from the previous one and is labeled on the basis of the labels of its immediate constituents and the relevant extended projection.

For example, take the root of the word *cat*, $\sqrt{}$cat. It has no category but may Self Merge, giving the set {$\sqrt{}$cat}, a syntactic object distinct from the root it contains. Now this object needs a label. That label can be any category that can start an extended projection. We could choose N, in which case each further

structure-building operation will elaborate a nominal extended projection, or
we could choose V, or A, depending in part on the root's categorial flexibility.

   Let's say we take the label of $\{\sqrt{cat}\}$ to be N. Now we can either Self Merge
this, giving $\{\{\sqrt{cat}\}\}$, or we could Merge, say, (the extended projection of)
some quantifier with it, giving $\{\{\sqrt{some}\}\{\sqrt{cat}\}\}$. In either case, the new object
needs a label, and in both cases that label will be a function of the labels of
the constituent(s) that the object contains and the sequence of categories in the
independently given extended projection of N. For example, in the binary case,
the label will be some category in the extended projection of N whose specifier
can be a quantifier (say, Q). In the unary case, it will be a further category in the
semantic development of the nominal (e.g., a category Num, marking number).

   The structures that emerge from a system like this are what Brody (2000a)
calls "telescoped" (see also Starke 2004). There is no independent head for any
category except the root. Thus, rather than (1), we have (2).

(1)

(2)
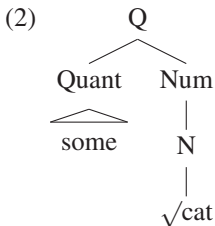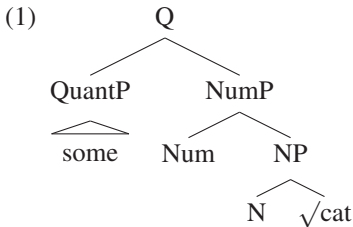
I argue that this way of labeling structure is simpler than the standard Bare
Phrase Structure system. In either system, one needs to state both the order of
categories in an extended projection or functional sequence (see Starke 2001;
Adger 2003; Williams 2003) and to provide categories for roots. Bare Phrase
Structure just adds to that an extra notion of endocentricity that arises because
functional categories are taken to be lexical items. I reject that assumption.
Within this new system, the labeling problems do not arise, and as I argue in
chapter 2, a unified labeling algorithm can be given.

   This then is the basic architecture of the system I propose for separating off
structure building from structure labeling. There are some immediate proper-
ties of this system that need comment.

First, Self Merge (Guimaraes 2000; Kayne 2010) is a fundamental operation. I argue that this operation comes for "free" by removing a stipulation in the standard version of Merge, thus simplifying the definition of Merge.

Second, it is, in this system, impossible to Merge a root with a syntactic object distinct from that root. This is because roots on their own are not in the domain of the labeling algorithm (see section 2.3.1). It follows that arguments cannot be introduced as sisters to lexical roots and that the semantic relation between a root and an argument must be negotiated by functional structure. Of course, this is no surprise, given the huge range of work that has argued for just this conclusion, on mainly empirical grounds, in the last decade (Kratzer 1996; Hale and Keyser 2002, Ramchand 2003; Borer 2005b; Bowers 2010, among many others). However, in the theory I develop here, this conclusion is a consequence of the computational system rather than an empirical claim. This property of the system also highlights the stipulative nature of the notion of a special local domain for the introduction of arguments: there is no theoretically sound reason to take arguments to be local to their apparent root. In fact, the phrase structure system forces a divorce between a root and its arguments.

Third, if there are no functional heads, what are we to make of functional morphemes, both bound and free? I propose that bound morphemes are just pronunciations of functional categories attached to roots via extended projections (in a way that is similar to Brody 2000a or more particularly to the notion of spanning developed in Williams 2003), whereas at least some free functional morphemes are spell-outs of these categories that are not so attached (i.e., they are spell-outs of fragments of extended projections). Other free, apparently functional, morphemes, like auxiliaries, are spell-outs of structures built up from lexical roots, as described above for $\sqrt{}$cat.

Finally, in a binary structure like the uppermost branches in (2), given that the label is dependent on both daughters, there is no way of defining the classical notion of specifier or complement (as, say, second and first Merge, respectively). The structure is, as far as the syntactic operations are concerned, entirely symmetrical. However, asymmetrical interpretations need to be imposed by the semantic interface for identification of function-argument structure and by the articulatory or acoustic interface for identification of linear order. I define new notions of complement and specifier that read these asymmetries off of the extended projection information in the tree. If a mother and daughter are in the same extended projection, and the daughter is lower in that projection, then the daughter is a complement of the mother; otherwise, the daughter is a specifier of the mother. So in (2), because Num and Q are in the same extended projection, and Num is lower than Q, Num is the complement of Q. Because Quant and Q are not in the same extended projection, Quant is a specifier of Q.

These relations are then treated asymmetrically by both the semantics (where complements are composed before specifiers) and by the linearization systems (where complements are linearized after specifiers).
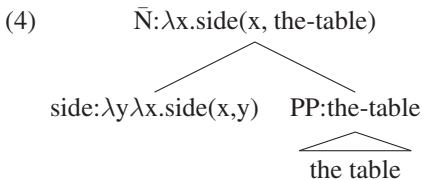
This last point has an important consequence, probably the most important of the entire system. It makes roll-up (and hence remnant roll-up) derivations impossible. To see why, consider a structure like (3). In this structure, suppose that all nodes labeled X are in the same extended projection, and that the sub-scripted numbers indicate the height of the label in that extended projection. In (3), where X_2 has moved from inside X_4, both daughters of X_5 are in the same extended projection, and both are lower in that extended projection than their mother. In such a configuration, it is impossible to determine which is the complement, no asymmetry can be imposed by the interfaces, and the structure is uninterpretable.

(3) X_5

    X_2 X_4

            $\langle X_2 \rangle$
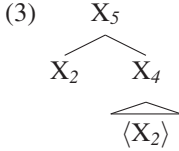
This system then rules out roll-up derivations as a matter of the computational system and therefore provides a more restrictive theory of syntax than that currently supposed. I argue for a different way of capturing apparent roll-up effects in chapter 3 that replaces them with base-generated structures (see also Brody and Szabolcsi 2003; Adger, Harbour, and Watkins 2009).

I explore these various consequences of the theory in chapters 4 to 6, concentrating on the syntax of relational nominals, which provides a strong argument for the nonexistence of a notion of a locality domain for the satisfaction of argument structure. I also show that there is surprising evidence for a base-generation approach over a roll-up movement approach to the ordering and hierarchy of the constituents of the noun phrase. I provide a brief summary here.

The standard view of relational nominals emerges from a combination of the syntactic analysis proposed in Chomsky 1970 combined with the idea that relational nominals are semantically parallel to transitive verbs in being two-place predicates:

(4) $\bar{N}:\lambda x.side(x, the\text{-}table)$

    $side:\lambda y \lambda x.side(x,y)$ PP:the-table

                        the table

However, a major problem with this approach is that, across languages, the presence of the internal argument of the relational nominal is systematically optional, whereas for verbs it is (at least descriptively speaking) lexically determined.

I argue that the evidence for true argument structure in relational nominals is lacking (see Higginbotham 1983; Zubizarreta 1987; Grimshaw 1990). Furthermore, connected to this lexicosemantic claim, the theoretical system developed in this book makes (4) an impossible representation because the PP cannot be a complement of a lexical head. Instead, the closest representation is (5), where Ñ and G are categories in the extended projection of the nominal:

(5)

```
                G
           /         \
         PP            Ñ
      ⌒⌒⌒           ⌒⌒
   of the table      side
```
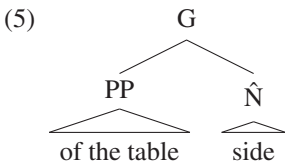
This representation itself raises two problems: one of the ordering of the constituents, and one of the etiology of the relational semant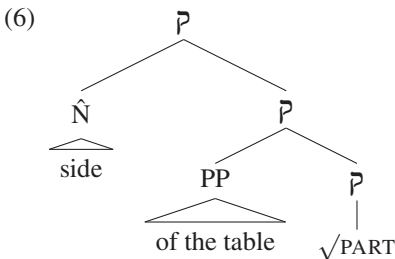ics. Given that the PP is a specifier of G, why is the order not *of the table side* and how is the semantics of *side* appropriately projected through its extended projection to the point where it can take *of the table* as an argument?

I show, however, that the representation in (5) should be replaced by (6), where *side* is not relational (i.e., it just means $\lambda x.\text{side}(x)$), and where the type of the relation (in this case, it is a *part* type of relation) is introduced by a light root. The structure built from Self Merge of this root is labeled with a category I dub כ, which is responsible for the function-argument structure that encodes relationality and for the introduction of the prepositional case-marking morphology.[1]

(6)

```
                    כ
            /              \
          Ñ                 כ
         ⌒⌒           /          \
         side       PP             כ
                  ⌒⌒⌒            |
               of the table     √PART
```

The semantics of כ is a relation whose type is identified by the root, in this case $\lambda y\lambda x.\text{part}(x,y)$. This directly combines with its specifier *the table* to give a meaning of $\lambda x.\text{part}(x,\text{the-table})$. Morphosyntactically, כ values the case feature

on *the table*, and this valued case feature is realized as *of*. Once ꟼ and *of the table* have Merged, the new constituent is then of the correct semantic type to combine with *side* as a predicate modifier, giving:

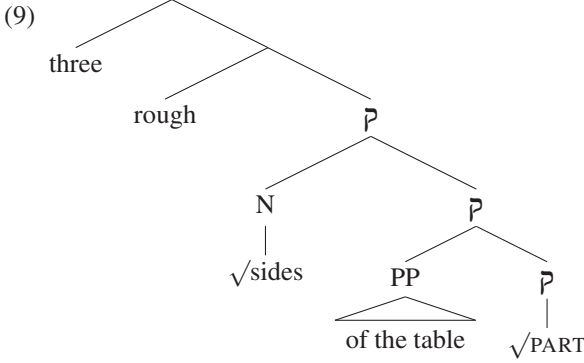(7) λx.side(x) $\wedge$ part(x,the-table)

This approach provides a solution for the ordering problem in that the projection of the relational nominal (understanding this phrase as now being purely descriptive) is in a specifier of ꟼ. The category ꟼ combines first with its argument PP, which is a specifier and which linearizes to the left of the projection line, assuming a standard view that takes specifiers to linearize to the left of their complement (Kayne 1994; Brody 2000a). The N̂ containing *side* is then also specifier of the ꟼ category that has a complement that contains the PP. If we continue to assume the standard view of linearization, the N̂ containing *side* will, perforce, appear to the left of the PP. The etiology of the relationality is in a functional category ꟼ, whose relation is named by the root it contains (in this case, $\sqrt{}$PART) and whose semantics projects through the structure as is standard.

This approach immediately captures the optionality of the "argument" of a relational nominal. There is a perfectly well formed syntactic derivation for *side* that does not involve relational ꟼ, in much the same way that there is a perfectly well formed syntactic derivation for *side* that does not involve a numeral, or an adjective, giving the "optionality" of numerals and adjectives. Assuming that D is Merged higher than ꟼ, and that there is a syntactic dependency between the structure projected by the root *side* and D, we rule out a structure with no "lexical" root, containing only ꟼ (so **the of the table*).

The next question that arises is the identity of N̂. If N̂ is actually just N, then the resulting structure closely mimics the traditional view, with the PP being structurally separated from the N by a minimal layer of functional structures. However, unlike the standard approach, the perspective adopted here takes N̂ to be a specifier, so it is possible that N̂ is actually rather larger than just the root plus the lexical category N. We therefore, unlike the classical approach, allow constituent structures where the PP is external to a constituent containing a fair amount of nominal material:

(8)
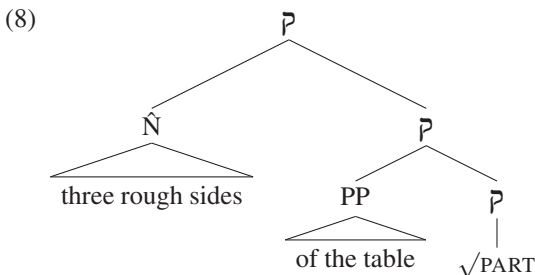
This contrasts with a structure that would be more similar to the classical view proposed and defended in Chomsky 1970:

(9)

```
              three
                    rough
                            p̄
                    N              p̄
                    |
                 √sides    PP          p̄
                        of the table   |
                                     √PART
```

It is then an empirical question as to which is superior.

I show in chapter 5 that the correct view is the one allowed by the new system: the relational nominal projects sufficient structure to allow Merge of intersective APs, numerals, and cardinal quantifiers, and some markers of definiteness before it is Merged with p̄. The primary evidence for this is the interaction of the syntax of APs, PPs, and N, which I show is best captured by this new approach. The conclusions of this investigation also allow us an understanding of a new typological generalization that I call PP Peripherality:

(10) *PP Peripherality*
    When (intersective) AP modifiers and PP "complements" both occur to one side of N inside a noun phrase, the PP is separated from the N by the AP.

What (10) captures is the fact that, across languages, the PP complement appears further away from the head noun than most AP modifiers. This is entirely unexplained on the standard account but is expected on the picture drawn here.

Chapter 5 also takes up the issue of the relations within the DP in more detail. It proposes that articles are actually the spell-out of a definiteness projection "lower" than p̄, when that projection has moved to the specifier of D. Combined with a view of genitive possessors that takes them to be derived via movement from a p̄-like projection to the specifier of D for case reasons, this predicts the complementarity between articles and genitive possessors seen in many unrelated languages.

However, the empirical evidence presented in chapter 5 for the order and constituency of AP and PP constituents of the noun phrase is actually also compatible with a movement account. That is, the structure in (9) can be mimicked

by taking the PP to be generated in the standard position as a complement of
N and then to raise to a higher specifier position, followed by movement of the
remnant, as in Kayne 2004, Cinque 2006, and elsewhere:

(11)

$$\hat{N}$$

rough [sides ⟨of the table⟩]   of the table   PP   ⟨N̂⟩
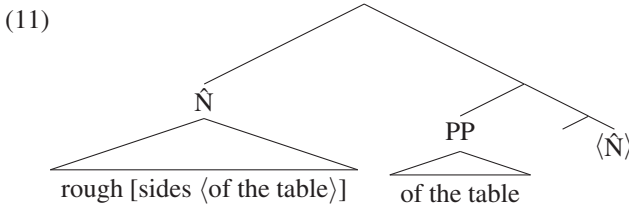
Here the PP is Merged with the noun *side*, this constituent is then modified
by an AP (*rough*), the PP is then moved leftward, and the remnant raised yet
further leftward. The theory laid out in chapters 2 and 3 rules out such a deriva-
tion, creating a sharp contrast with a looser remnant movement approach.

   This issue is taken up in chapter 6, where I show that the system developed
here makes superior predictions to those of a remnant roll-up analysis in the
domain of the interaction of binding and linear order (Pesetsky 1995; Cinque
2006). I argue that a simple surface binding algorithm is available in the repre-
sentations predicted by the theory developed here, whereas the remnant move-
ment analysis must appeal to selective reconstruction in a way that simply
recapitulates the empirical observations.

   Overall, on an empirical level, chapters 4 to 6 of the book argue that re-
lational nominals are not relational, that relationality is negotiated at some
structural distance from its apparent source, and that its true source is a light
root that names a relation that is semantically negotiated via functional struc-
ture. This leads to an explanation for the new (putative) universal mentioned
before: PP "complements" are more peripheral with respect to their apparent
selector than intersective modifiers.

   On a theoretical level, the book makes a case for separating off the algo-
rithm for labeling from the structure-building operations (Hornstein 2009) and
for telescoped syntactic representations (Brody 2000a) whose labels are de-
termined by universally given sequences of categories. The resulting symme-
try of structure requires that the interfaces impose asymmetries for semantic
and phonological interpretation, and I propose that the sequences of categories
(extended projections) are responsible for this assignment. This theoretical
configuration leads to two constraints on syntactic representations: first, lex-
ical roots cannot Merge with phrases, forcing complete severance of argument
introduction from the root; and second, roll-up and remnant roll-up derivations
are impossible, and so cannot be used as a means for capturing apparent mirror
effects in syntactic hierarchy and linear order.[2]

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