



EXPLAINING SYNTAX

Representations, Structures, and Computation

PETER W. CULICOVER

OXFORD
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Explaining Syntax

Previous books

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Syntactic Nuts: Hard Cases in Syntax

Foundations of Syntax, I

Oxford University Press 1999

Parasitic Gaps

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with Ray Jackendoff

Simpler Syntax

Oxford University Press 2005

with Elizabeth Hume

Basics of Language for Language Learners

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and Computation

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Preface

The articles collected here are all concerned in one way or another with a question that has engaged me ever since I began my study of natural language syntax: why does syntax have the properties that it has? In order to even attempt to imbue this question with empirical content, it is essential to determine what “syntax” is, and what its properties are. When I began the study of syntax as a graduate student in the 1960s, I thought I understood this, more or less, but as time has progressed, what seemed obvious or at least not to be disputed has become much less clear to me, and much more unstable. Some of the results of my attempts to reconstruct what “syntax” is, and what its properties are, at least for myself (and with my collaborators), are represented in this book.

This book considers various aspects of what the proper domain of syntax is (“Representations”), how to properly characterize the syntax of a language (“Structures”), and reasons why some syntactic possibilities might be more likely to be encountered than others (“Computation”). Hence the title—*Explaining Syntax: Representations, Structures and Computation*.

Collecting a representative set of articles such as this allows for some unique opportunities. One can look back and see how far one has come in some respects, one can look back and see how little one has changed in other respects, and one can correct errors, omissions, and various infelicities. And, not insignificantly, one can renew one’s acquaintance with one’s earlier avatars, a process occasionally accompanied by recognition, amazement, or shock. It is very gratifying to be able to do all these things here.

In looking back, I find the seeds of my most recent work, *Syntactic Nuts*, *Simpler Syntax* (with Ray Jackendoff) and *Grammar and Complexity* (forthcoming), in some of the pieces that I worked on as much as forty years ago. For example, in “OM-sentences: on the derivation of sentences with systematically unspecifiable interpretations” (reprinted here as Chapter 2), I was concerned with the fact that distributional patterns found in certain constructions that COULD be attributed to invisible syntactic structure NEED NOT be attributed to such structure if we take into account the fact that these constructions have interpretations that can be held responsible for the patterns. By taking this position I was swimming against the mainstream of the time, which for the most part has accepted without question the rule of thumb that if two sentences show the same distributional pattern, they have the same syntactic structure (visible or not). After forty years, I find that I am

still swimming against the mainstream (in this regard, at least—see the treatment of ellipsis in *Simpler Syntax* and more recently in Culicover and Jackendoff, 2012), although perhaps with more company than forty years ago.

On the other hand, much has changed. Perhaps the most important change concerns the status of linguistic unacceptability. Ray Jackendoff and I suggested in “A reconsideration of Dative Movements” (reprinted here as Chapter 11) that certain instances of unacceptability might be due to the way in which interpretations of sentences are computed, and not to the grammar *per se*. We wrote “The distinction between the rules of the grammar and how the rules are used by the speaker or hearer to create or interpret sentences is still scrupulously maintained. All that is changed is that it is no longer so obvious what sentences are to be generated by the rules: we cannot rely entirely on intuition to determine whether an unacceptable sentence is grammatical or not (using ‘grammatical’ in the technical sense ‘generated by the grammar’).” This is a perspective that I take up and elaborate on at some length in *Grammar and Complexity*.

Another theme that has occupied me for much of the past forty years has been the proper treatment of ‘constructions’ in grammar. I explored this issue in “On the coherence of syntactic descriptions”, where I tried to capture the naturalness of a grammar containing a set of distinct constructions that make use of similar or identical structures. When this paper was published in 1973, it was still commonplace to think of grammars as consisting of constructions. Formal syntacticians were just beginning to contemplate the idea that constructions are epiphenomenal reflexes of more abstract parameter settings. This latter view had its roots in the analysis of the passive construction in Chomsky’s “Remarks on nominalization” (Chomsky, 1972) and came to occupy a central position in mainstream work over the next twenty years or so. But as many of the papers included here show, I have always taken seriously the idea that constructions are properly part of grammars, not epiphenomenal. In *Grammar and Complexity* I come back to the role of constructions in defining the formal complexity of a grammar and in accounting for language change.

In order to provide a more general overview of these various themes and to link the pieces reproduced here to more recent developments in the field, I include a brief article entitled “The Simpler Syntax Hypothesis”, by Ray Jackendoff and myself as Chapter 1. For those chapters that originally lacked abstracts I have written brief summaries that highlight their main goals, results, and shortcomings, and link them to later work. I have taken the opportunity in editing the articles to correct a few youthful indiscretions and overstatements, to fix errors in trees and references, adding those that should have been cited but were not, to omit some discussion that is particularly irrelevant to contemporary concerns, and to interject a few comments

where it seems to me that some additional clarification or cross-referencing is necessary or an observation is pertinent. These comments for the most part take the form of lettered footnotes, which I have tried to keep to a minimum in order to maintain the flow of the narrative; there are a few minor comments in square brackets where a footnote would be overkill. I have introduced or revised section headings and numbers, and made a number of other minor alterations in order to achieve a more uniform format for the chapters.

Yet another welcome opportunity afforded by putting together this collection is that I am able to fully acknowledge my gratitude to my collaborators Jirka Hana, Ray Jackendoff, Bob Levine, Andrzej Nowak, Michael Rochemont and Wendy Wilkins. I have been blessed by being in a position to work with a number of wonderful scholars, and to accomplish with them results that I could never have imagined achieving on my own. I am so pleased that they have given me permission to reproduce our joint work here. While in science it is certainly true that the destination is of critical importance, the journey has been most extraordinary.

Each article contains an acknowledgment of the original publisher. I am also grateful to two reviewers of this collection for Oxford University Press for their useful feedback and suggestions, many of which I have followed up on.

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Prologue

The Simpler Syntax Hypothesis

(2006)*

Peter W. Culicover and Ray Jackendoff

What roles do syntax and semantics have in the grammar of a language? What are the consequences of these roles for syntactic structure, and why does it matter? We sketch the Simpler Syntax Hypothesis, which holds that much of the explanatory role attributed to syntax in contemporary linguistics is properly the responsibility of semantics. This rebalancing permits broader coverage of empirical linguistic phenomena and promises a tighter integration of linguistic theory into the cognitive scientific enterprise. We suggest that the general perspective of the Simpler Syntax Hypothesis is well suited to approaching language processing and language evolution, and to computational applications that draw upon linguistic insights.

1.1 Introduction

What roles do syntax and semantics have in the grammar of a language, and what are the consequences of these roles for syntactic structure? These questions have been central to the theory of grammar for close to 50 years. We believe that inquiry has been dominated by one particular answer to these questions, and that the implications have been less than salutary both for linguistics and for the relation between linguistics and the rest of cognitive science. We sketch here an alternative approach, Simpler Syntax (SS), which offers improvements on both fronts and contrast it with the approach of mainstream generative grammar (Chomsky 1965; 1981a; 1995). Our approach, developed in three much more extensive works (Culicover 1999; Jackendoff 2002; Culicover and Jackendoff 2005), draws on insights from various

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alternative theories of generative syntax (Perlmutter 1983; Pollard and Sag 1994; Van Valin and LaPolla 1997; Bresnan 2001; Goldberg 2006).

1.2 Two views on the relation between syntax and semantics

A central idealization behind mainstream generative grammar, shared by much of formal logic and other approaches to language, is classical Fregean compositionality (FC):

FC: “The meaning of a compound expression is a function of the meaning of its parts and of the syntactic rules by which they are combined.” (Partee et al. 1990)

Although many linguistic phenomena are known to be problematic for this view, it is fair to say that a strong form of FC is generally taken to be a desideratum of syntactic theory construction.

FC appears to be violated, for example, in circumstances where certain aspects of sentence meaning do not seem to be represented in the words or syntactic structure of the sentence. In sentence (1), one understands Ozzie to be not only the ‘tryer’ but also the ‘drinker’, even though the noun phrase *Ozzie* is not overtly an argument of the verb *drink*.

(1) Ozzie tried not to drink.

The masterstroke behind mainstream generative grammar was to propose that the missing piece of meaning is supplied by an element in a covert level of syntactic structure (‘deep structure’ in early work, later ‘Logical Form’). Sentence (1) has the covert form (2), in which the verb *drink* actually does have a subject—PRO, an unpronounced pronoun whose antecedent is *Ozzie*.

(2) Ozzie tried [PRO not to drink].

Such an approach is effective—and appealing—for relatively straightforward situations such as (1). However, we show that carrying this strategy through systematically leads to unwelcome consequences.

Alternatives to FC are:

Autonomous Semantics/AS: Phrase and sentence meanings are composed from the meanings of the words plus independent principles for constructing meanings, only some of which correlate with syntactic structure.

Simpler Syntax Hypothesis/SSH: Syntactic structure is only as complex as it needs to be to establish interpretation.

Under SSH, sentence (1) needs no hidden syntactic structure. The fact that *Ozzie* is understood as the ‘drinker’ results from a principle of semantic

interpretation that assigns *Ozzie* this extra role. Thus, semantics can have more elaborate structure than the syntax that expresses it.

Let us make more precise our notion of syntactic complexity. For Simpler Syntax, the complexity of syntactic structure involves the extent to which constituents contain subconstituents, and the extent to which there is invisible structure. Thus, the structure of *A* in (3a) is simpler than in (3b) or (3c), where β is an invisible element. SS will choose (3b) or (3c) only if there is empirical motivation for the more complex structure.

- (3) a. [_A B C D]
 b. [_A B [_a C D]]
 c. [_A B [_a β C D]]

SSH allows the possibility of abstract elements in language when there is empirical motivation for their syntactic (and psychological) reality. In particular, it acknowledges the considerable linguistic and psycholinguistic evidence for ‘traces’—the gaps that occur in languages such as English when constituents appear in non-canonical position (Featherston 2001):

- (4) What do you think you’re looking at ____ ?
 Theories like that, I have a really hard time believing in ____.

Despite the considerable reduction of complexity under Simpler Syntax, syntactic structure does not disappear altogether (hence the term ‘simpler syntax’ rather than ‘simple’ or ‘no syntax’). It is not a matter of semantics that English verbs go after the subject but Japanese verbs go at the end of the clause—nor that English and French tensed clauses require an overt subject but Spanish and Italian tensed clauses do not; that English has double object constructions (*give Bill the ball*) but Italian, French, and Spanish do not; that English has *do*-support (*DID you see that?*) but Italian, French, German, and Russian do not; that Italian, French, and Spanish have object clitics (French: *Je t’aime*) before the verb but English does not. It is not a matter of semantics that some languages use case morphology or verbal agreement, or both, to individuate arguments. That is, there remains a substantial body of phenomena that require an account in terms of syntactic structure.

1.3 Mainstream syntactic structures compared with Simpler Syntax

The choice between the two approaches to (1) does not seem especially consequential. However, following FC to its logical end turns out to have radical consequences for the syntactic analysis of even the simplest sentences. For example, Figure 1.1(a) shows the structure of the sentence *Joe has put those raw potatoes in the pot*, based on the treatment in a contemporary mainstream

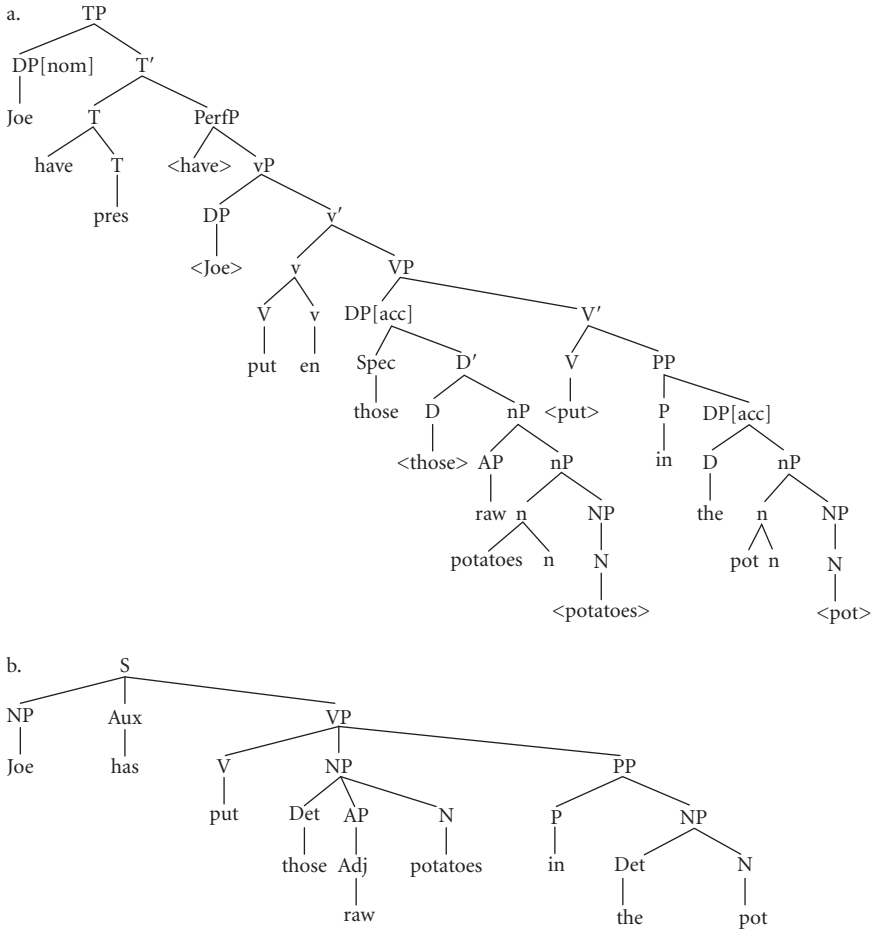


FIGURE 1.1. (a) A mainstream analysis of *Joe has put those raw potatoes in the pot*. Elements in brackets are unpronounced copies of elements elsewhere in the tree. (b) Simpler Syntax analysis of *Joe has put those raw potatoes in the pot*.

textbook for beginning graduate students (Adger 2003). The literature offers many other variants of comparable complexity.

Figure 1.1(a) is representative of the most recent version of mainstream theory, the Minimalist Program (Chomsky 1995; Lasnik 2002). Such a structure typically incorporates many elements that do not correspond to perceived form (e.g. *v*, *n*, and multiple copies of *Joe*, *have*, *put*, and *potatoes*), as well as many constituents that are motivated largely on theoretical grounds. Classical constituency tests, such as the ability to displace as a unit, provide motivation only for major constituent divisions such as TP, DP, and PP.

By contrast, in SS this sentence has the structure in Figure 1.1(b), which contains only the classical constituent divisions and which has no hidden elements or inaudible copies.

1.4 Application to Bare Argument Ellipsis

Differences between mainstream theory and SS emerge also in many other cases. One compelling phenomenon is Bare Argument Ellipsis (BAE), illustrated in B's reply to A in example (5). (We sketch here only the highlights of the detailed argument in Culicover and Jackendoff 2005.)

- (5) A: Ozzie says that Harriet's been drinking.
B: Yeah, scotch.

B's reply conveys the same meaning as sentence (6), thus going beyond the meanings of *Yeah* and *scotch*.

- (6) B: Yeah, Harriet's been drinking scotch.

If all aspects of understanding must be explicit in syntactic structure, it is necessary to posit (i) a complete syntactic structure for B's reply along the lines of (6), and (ii) a syntactic or phonological process that deletes everything but the words *yeah* and *scotch*. This deletion has to be based on syntactic identity with the *antecedent* of the ellipsis—that is, the relevant portions of A's preceding statement.

In SS, such full syntactic structure and deletions are unnecessary. The syntactic structure of B's reply is just the string of two words, and its interpretation is determined by grafting the meanings of the two words onto an appropriate place in the *meaning* of A's statement, without any necessary syntactic support (Jacobson 1992; Lappin 1996; Stainton 1998; Kehler 2000).

At this point, the FC and SS accounts diverge. The relation between the elliptical utterance and its antecedent depends not on syntactic identity, but rather on delicate factors in the semantics of the antecedent. For instance, there is no *syntactic* difference among A's utterances in (5) and (7), but the interpretation of the antecedent is clearly different.

- (7) a. A: Ozzie fantasizes that Harriet's been drinking.
B: Yeah, scotch. ['Ozzie fantasizes that Harriet's been drinking scotch', *not* 'Harriet's been drinking scotch']
b. A: Ozzie doubts that Harriet's been drinking.
B: Yeah, scotch. [no plausible interpretation]

An approach to ellipsis that depends only on syntactic structure cannot capture these differences.

Moreover, in many examples of ellipsis, the putative hidden syntactic forms either are ungrammatical (8i and 9i) or diverge wildly from the form of the antecedent (8ii and 9ii).

- (8) A: John met a guy who speaks a very unusual language.
 B: Which language?
 i. *Which language did John meet a guy who speaks?
 ii. Which language does the guy who John met speak? (Ross 1969b; Lasnik 2001; Merchant 2001)
- (9) A: Would you like a drink?
 B: Yeah, how about scotch.
 i. *Yeah, how about would you like scotch.
 ii. Yeah, how about you giving me scotch.

The antecedent can even extend over more than one sentence, so the ellipsis cannot possibly be derived from a hidden syntactic clause.

- (10) It seems we stood and talked like this before. We looked at each other in the same way then. But I can't remember where or when. (Rodgers and Hart 1937)

This is not to say that ellipsis is a purely semantic phenomenon. It is also constrained by the syntax and lexicon of the language, as seen in (11) and (12).

- (11) A: Ozzie is flirting again.
 B: With who(m)?
 B': *Who(m)?
- (12) A: What are you looking for?
 B: Those. [pointing to a pair of scissors]

The ellipsis in (11) must include *with* because *flirt*, in the antecedent, requires it; this is often taken to be evidence for deletion of a syntactic copy of the antecedent (Merchant 2001). However, the ellipsis in (12) must be plural, not because of something in the antecedent but because the unmentioned word *scissors* is plural. SSH proposes a mechanism that accounts for these cases together (Culicover and Jackendoff 2005).

Examples (8)–(10) and (12) show that *in general* BAE cannot be accounted for by deletion of syntactic structure that is identical to the antecedent. Thus, there appears to be no reason to invoke such an account for cases such as (5) and (11) either. Although the meanings of the words certainly contribute to the interpretation of the sentence, they are combined by semantic principles that go

beyond a simple mapping determined by syntactic structure—a richer compositionality than FC.

1.5 Some other cases where Fregean compositionality does not hold

BAE is by no means unique. We illustrate several other cases, drawn from Culicover and Jackendoff (2005). In the following cases, as in BAE, substantive aspects of the meaning of a phrase or sentence cannot be identified with the meaning of any individual word or constituent.

1.5.1 Metonymy

An individual can be identified by reference to an associated characteristic, as when a waitperson says to a colleague,

- (13) The ham sandwich over there wants more coffee.

The intended meaning is ‘*the person who ordered/is eating* a ham sandwich’. FC requires the syntax to contain the italicized material at some hidden syntactic level. Another example is (14), in which the interpretation of *Chomsky* is clearly ‘*a/the book by Chomsky*’.

- (14) Chomsky is next to Plato up there on the top shelf.

Simpler Syntax says that the italicized parts of the interpretation are supplied by semantic/pragmatic principles, and the syntax has no role.

1.5.2 Sound + motion construction

- (15) The trolley rattled around the corner.

The meaning of (15) is roughly ‘The trolley went around the corner, rattling’. *Rattle* is a verb of sound emission, not a verb that expresses motion. Hence, no word in the sentence can serve as source for the understood sense of the trolley’s motion. FC requires a hidden verb *go* in the syntax; SS says this sense is supplied by a conventionalized principle of interpretation in English that is specific to the combination of sound emission verbs with path expressions such as *around the corner* (Levin and Rappaport Hovav 1995; Goldberg and Jackendoff 2004).

1.5.3 Beneficiary dative construction

In a double object construction such as *build Mary a house* (paraphrasing *build a house for Mary*), the indirect object (*Mary*) is understood as coming

into possession of the direct object (*a house*). The possession component of meaning does not reside in the meaning of *build*, *Mary*, or *house*, but in the construction itself. FC requires an explicit but hidden representation of possession in syntactic structure; SS supplies this sense as a piece of meaning associated with the double object construction as a whole (Goldberg 1995).

These cases are a small sample of the many well-studied phenomena in which FC requires hidden elements in syntactic structure, motivated only by the need for syntax to express full meaning explicitly.

We thus face a choice between two approaches: one in which semantics and syntax are closely matched but syntactic structure is elaborate and abstract, and one in which syntactic structure is relatively simple and concrete but there is considerable mismatch between semantics and syntax. How does one decide between the two?

1.6 Choosing between the two approaches

We have seen that SSH offers a more general account of empirical linguistic phenomena such as BAE. Therefore, it should be preferred on grounds internal to linguistics. However, there are also two reasons why Simpler Syntax is preferable within the broader cognitive scientific enterprise.

The first reason is that SS enables closer ties between linguistic theory and experimental research on language processing. Virtually all research on language perception and production from the earliest days (Fodor et al. 1974) to contemporary work (Brown and Hagoort 1999) presumes syntactic structures along the lines of Figure 1.1(b). We know of no psycholinguistic research that strongly supports the invisible copies, the empty heads, and the elaborated branching structure of structures such as Figure 1.1(a) (but see Bever and McElree 1988; Bever and Townsend 2001; Friedmann and Shapiro 2003; Grodzinsky 2000 for experimental evidence for invisible copies in certain constructions). Tests of processing or memory load involving reaction time, eye movements, and event-related potentials appear to be sensitive to relative complexity in structures of the SS sort. We know of no convincing predictions based on structures such as Figure 1.1(a) that bear on processing complexity.

Mainstream generative grammar has tended to distance itself from processing considerations by appealing to the theoretical distinction between competence—the ‘knowledge of language’—and performance—how knowledge is put to use in processing. According to this stance, psycholinguistics need not bear directly on the adequacy of syntactic analyses. In SS, by contrast, rules of grammar are taken to be pieces of structure stored in memory, which can be assembled online into larger structures. In the next section we sketch some of the motivation behind this construal of

grammatical rules. Thus, Simpler Syntax suggests a transparent relation between knowledge of language and use of this knowledge, one that has begun to have a role in experimental studies of online processing and of aphasia (Piñango 1999; 2000).

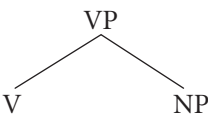
1.7 Rules of grammar are stored pieces of structure

Like every other theory of language, Simpler Syntax treats words as stored associations of pieces of phonological, syntactic, and semantic structure. However, unlike approaches that assume FC, where only individual words contribute to the construction of a meaning, SS enables storage of more complex structures with associated meanings. For instance, an idiom such as *kick the bucket* can be stored as an entire verb phrase, associated in memory with its idiosyncratic meaning, ‘die’. All languages contain thousands of such complex stored units. Among the idioms are some with idiosyncratic syntactic structure as well as idiosyncratic meaning, for example (16) (Culicover 1999):

- (16) *Far be it from NP to VP.* Far be it from me to disagree with you.
PP with NP! Off with his head! Into the house with you!
How about X? How about a scotch? How about we talk?
NP and S. One more beer and I’m leaving. [Culicover 1970]
The more S. The more I read, the less I understand. [Culicover and Jackendoff 2005; den Dikken 2005]

These reside in the lexicon as associations of meanings with non-canonical syntactic structure. Other idioms, including the sound + motion construction (§1.5.2) and the beneficiary dative (§1.5.3), attach idiosyncratic meaning to a standard syntactic structure, but do not involve particular words.

Once pieces of syntactic structure can be stored in the lexicon associated with meanings, it is a simple step to store pieces of syntactic structure that have no inherent meaning beyond Fregean composition, such as (17).

- (17)
- 
- ```

graph TD
 VP[VP] --- V[V]
 VP --- NP[NP]

```

This piece of structure is equivalent to a traditional phrase structure rule  $VP \rightarrow V NP$ . Thus, it is possible to think of the lexicon as containing all the rules that permit syntactic combinatoriality. These are put to use directly in processing, as pieces available for constructing trees.



Simpler Syntax shares this continuity between idiosyncratic words and general rules with several related frameworks, most notably Head-Driven Phrase Structure Grammar (Pollard and Sag 1994) and Construction Grammar (Goldberg 2006).

Along related lines, a major objective of computational linguistics is to assign meanings to strings of words on the basis of some syntactic analysis; many approaches (e.g. Klavans and Resnik 1996; Manning and Schütze 1999) combine symbolic and statistical methods to identify the syntactic structure associated with a string. The syntactic theory most widely used in computational linguistics is Head-Driven Phrase Structure Grammar (Pollard and Sag 1994), one of the frameworks that adopt some version of SSH. Again, we think that the reason for this choice is that SSH is sufficient for establishing interpretation, and more elaborate structure is unnecessary.

There is a second, deeper reason why SSH should be of interest to cognitive science as a whole. Recall that mainstream generative grammar is based on the assumption of Fregean compositionality. FC implies that sentence meaning has no combinatorial structure that is not derived from the syntactic structure that expresses it.

Now, intuitively, the meaning of a sentence is the thought that the sentence expresses. Thus, Fregean compositionality suggests that *without language there is no COMBINATORIAL thought*—a position reminiscent of Descartes. Such a conclusion flies in the face of overwhelming evidence from comparative ethology that the behavior of many animals must be governed by combinatorial computation. Such computation is arguably involved, for instance, in comprehending complex visual fields, planning of action, and understanding social environments, capacities present in primates as well as many other species (Gallistel 1990; Hauser 2000). Given its focus on syntax, mainstream generative grammar has not taken the apparent conflict between these two conclusions as a central concern.

Simpler Syntax, by contrast, regards linguistic meaning as largely coextensive with thought; it is the product of an autonomous combinatorial capacity, independent of and richer than syntax. This allows the possibility that thought is highly structured in our non-linguistic relatives—they just cannot express it. Combinatorial thought could well have served as a crucial pre-adaptation for the evolution of combinatorial expression, i.e. human language (Jackendoff 2002; Newmeyer 1998; Wilkins 2005).

Some components of meaning, particularly argument structure, are encoded fairly systematically in syntax. Others, such as modality, aspect, quantifier scope, and discourse status, receive relatively inconsistent syntactic encoding within and across languages. On this view, language is an imperfect but still powerful means of communicating thought.

## 1.8 Conclusion

The choice between mainstream syntax and Simpler Syntax is important at three levels.

- First, Simpler Syntax affords broader empirical coverage of grammatical phenomena.
- Second, Simpler Syntax enables a stronger link between linguistic theory and experimental and computational accounts of language processing. Changing the balance between syntax and semantics along the lines proposed by Simpler Syntax might contribute to resolving longstanding disputes about their relative roles in language processing (Brown and Hagoort 1999).
- Third, Simpler Syntax claims that the foundation of natural language semantics is combinatorial thought, a capacity shared with other primates. It thus offers a vision of the place of language in human cognition that we, at least, find attractive.

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## **PART I**

# **Representations**

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## OM-sentences

*On the derivation of sentences with systematically unspecifiable interpretations*

(1972)\*

### Remarks on Chapter 2

This chapter explores the form and interpretation of ‘OM-sentences’ such as *One more can of beer and I’m leaving*. I originally observed in a short squib (Culicover 1970) that, strikingly, the connectivity between the ‘one more’ phrase and the conjoined clause is the same as that found in full sentences. Following the standard mode of argumentation in syntax launched in the 1960s (and still actively employed to this day), we might then conclude that we get the same patterns in both cases because the ‘one more’ phrase is the elliptical form of a full sentence. I argue that this conclusion is wrong; rather, OM-sentences are instances of a particular construction whose interpretation is constrained by the form, but not fully specified by the form. It follows that the connectivity must be mediated by the semantics and pragmatics. Essentially the same arguments are made in my later work with Jackendoff on related phenomena, e.g. pseudo-imperatives such as *Don’t move or I’ll shoot* and Bare Argument Ellipsis (see Culicover and Jackendoff 2005, and Chapter 1).

The force of this argument goes directly to the question of whether there is invisible syntactic structure in elliptical constructions. The standard view in mainstream generative grammar, represented most prominently in current work by Merchant (2001), is that there is. But the evidence brought forth in this article and elsewhere (see Chapter 1 and references there) is that the invisible-structure position can be maintained only if we admit only the most manageable subset of data in our inquiry. The full range of phenomena suggests that the interpretation of elliptical constructions cannot in general

\* [This chapter appeared originally in *Foundations of Language* 8: 199–236 (1972). It is reprinted here by permission of the copyright holder, John Benjamins. I dedicate this chapter to the memory of Mike Harnish.]

simply be read off of invisible structure under conditions of syntactic identity with an antecedent. Rather, it is computed by rules of interpretation and inference, operating over the interpretation of fragments in relation to antecedent syntactic structure and discourse structure.

## 2.1 Introduction

This paper deals with the treatment in a transformational<sup>a</sup> grammar of sentences like the following:

- (1) One more can of beer and I'm leaving.

It will be shown in subsequent discussion that such sentences admit of three 'interpretations', which are very closely related to more commonly encountered constructions, including conditionals, but that nevertheless there are aspects of the interpretation of such sentences which are systematically un-specifiable. I will argue that these sentences should not be derived from more complex underlying structures, but that they are in fact underlain by structures characterizable by phrase structure rule (2).

- (2)  $S \rightarrow NP \text{ CONJ } S$

To complete the analysis, I will show how rules of semantic interpretation may be devised which capture the similarities between sentences like (1) and other constructions in a very natural way.

## 2.2 On OM-sentences

I will refer to sentences like (1) as 'OM-sentences'. One of the more noticeable properties of (1) is that it has an unusual surface structure, which is given schematically in (3).

- (3) NP and S

In general an OM-sentence is a sentence of the form in (3), with possible variation in the nature of the conjunction. I will also distinguish between different OM-sentences by the conjunction that they contain, e.g. '*and*-OM-sentence', '*or*-OM-sentence', etc. The NP and the S in (3) will be referred to by their category labels.

<sup>a</sup> Contemporary MGG terminology has dispensed with the classical term 'transformational' in favor of the more generic 'derivational'.

### 2.2.1 The readings of OM-sentences

An OM-sentence, such as (1), may have three different kinds of interpretation.

- (4) a. If you drink one more can of beer I'm leaving.  
 b. After I drink one more can of beer I'm leaving.  
 c. In spite of the fact that there is one more can of beer here, I'm leaving.

Let us refer to the reading in (4a) as the 'consequential' reading, the reading in (4b) as the 'sequential' reading, and the reading expressed by (4c) as the 'incongruence' reading. The significance of the first two terms should be clear; the third is so called because of the sense in which the sentence describes an unusual or unexpected event or state of affairs.<sup>1</sup>

It turns about that one's ability to 'get' a particular reading for a given sentence depends to a considerable extent on the contents of the NP and of the S. In general, the sequential reading is easiest to get, since it is comparatively simple to construct a context in which the event described by the S can chronologically follow an event involving the NP. It is somewhat more difficult to construct a context if the further requirement is placed on the activity described by the S that it somehow follow from the event involving the NP.

Consider, for example, the following.

- (5) The  $\left\{ \begin{array}{l} \text{*can of beer} \\ \text{Queen of England} \\ \text{best movie of the year} \\ \text{*day before yesterday} \end{array} \right\}$  and I'm leaving.

The best possible reading for the acceptable cases in (5) is the incongruence reading. A considerably less acceptable reading is the sequential reading, which is nevertheless possible if a sufficiently plausible context can be created, as in (6) and (7).

- (6) OK, we will discuss the Queen of England, and then I'm leaving.  
 (7) OK, I'll watch (what you call) the best movie of the year, and then I'm leaving.

It will be noted that the readings for an *or*-OM-sentence are not the same as those for an *and*-OM-sentence such as the ones just discussed. In fact, it would appear to be the case that there is only one possible reading for an *or*-OM-sentence, which in the case of (8) is represented by (9).

<sup>1</sup> In §2.4 I discuss ways in which this phenomenon may be further delimited. A solution to this problem is not crucial, however, to the present discussion.



- (8) A thousand cans of beer or I'm leaving.  
 (9) If you don't give me a thousand cans of beer I'm leaving.

### 2.2.2 A possible source for *and-OM-sentences*

It should come as no surprise that judgments concerning *and-OM-sentences* with the consequential interpretation correspond precisely to judgments about *if-then* sentences with the same range of auxiliaries. For example,

- (10) { a. One more can of beer and  
       b. If you drink one more can of beer } I leave.  
 (11) { a. One more can of beer and  
       b. If you drank one more can of beer } I would have left.

but

- (12) { a. \*One more can of beer and  
       b. \*If you had drunk one more can of beer } I had left.  
 (13) { a. \*One more can of beer and  
       b. \*If you had drunk one more can of beer } I will have been leaving.

The acceptable pairs of sentences correspond not only in their acceptability judgments, but also in their interpretation. For example, (11a) is interpretable only as a counterfactual: we know that whatever the event is which involves the NP *one more can of beer*, it did not take place. (10a), like (10b), is ambiguous. The latter can be paraphrased by either of the following two sentences.

- (14) a. Whenever you drink one more can of beer I leave.  
       b. If you drink one more can of beer (than you have already) I will leave.

The same information can be deduced from (10a): whatever the event involving the NP is, either (a) I always leave when it happens, or (b) I'm going to leave if it happens now.

While these observations might seem to be more than abundantly obvious, it is quite important, I think, to establish clearly how strict the correlation between conditionals and consequentials is. While it appears to be unavoidable that *and-OM-sentences* and *if-then* conditionals should be derived from the same source, considering evidence such as the preceding, nevertheless I do not believe that the precise nature of the relationship between them is as clear as it might seem on the surface. I will show in the course of this paper that it is inappropriate to analyze this relationship in transformational terms.

### 2.2.3 The conjunction

The evidence of the preceding sections indicated that the conjunction *and* may be associated with at least three interpretations, while the conjunction *or* may be associated with only one. We might go so far as to suggest that the interpretation of these sentences is centered around the conjunction, either through interpretive rules or transformations which map certain structures into *and* and *or*. The reason for this is that if the conjunction *and* were not involved in determining the possible readings of *and*-OM-sentences, it would be surprising that sentences with *or* did not also display the same range of variation in their interpretation, since both are coordinating. If the conjunction did not determine the meaning, or if the underlying structure did not determine the conjunction, then it would not make any difference what the conjunction was, assuming that the deep structures were otherwise the same.<sup>2</sup>

Furthermore, it can be shown on the independent grounds that *and* may occur with this range of readings, while *or* may not. I think that a quite plausible argument can be made for considering *and* itself to be the source of the three readings, and not some deeper structure, although no doubt an analysis which postulates a deeper structure than the one I propose can be made to work reasonably well, as far as a mere description of the data goes.<sup>b</sup>

What I would like to show now is that at the level of sentential coordination the conjunction *and* may participate in the assignment of one of at least three readings. I will call these readings ‘consequential’, ‘sequential’, and ‘juxtapositional’, to express a partial similarity with previously discussed interpretations with respect to OM-sentences.

(15) John came in and Bill jumped out the window.

The consequential reading of (15) may be given as a paraphrase in (16).

(16) Bill jumped out of the window because John came in.

The sequential reading is illustrated in (17).

(17) John came in and then Bill jumped out the window.

The juxtapositional reading may be paraphrased by (18).

<sup>2</sup> It might be argued that the deep structures of sentences with *or* are significantly different from those with *and*. If this were true then it would not be possible to appeal to similarity of structure up to the nature of the conjunction. I see no evidence to suggest, however, that sentences with *and* and with *or* are not all derived from deep structures displaying coordinate structure.

<sup>b</sup> I make much the same argument for not deriving idiosyncratic constructions (‘syntactic nuts’) from abstract syntactic structures in Culicover (1999) and Culicover (2013).

- (18) Two things happened which were not necessarily related: John came in and Bill jumped out of the window.

Perhaps a better example of the juxtapositional reading, where there is no likely confusion between it and the other two, is the following.

- (19) Last year it rained one foot and it snowed three feet.

The three readings of (15) may be summarized by (20).

- (20) John came in and  $\left\{ \begin{array}{l} \text{therefore} \\ \text{then} \\ \text{also} \end{array} \right\}$  Bill jumped out the window.

I expect that there will be no doubt that (15) may have these readings. What is more interesting is that two of these three readings correspond to readings which we established for the *and*-OM-sentences, while the third is closely related to one of them. Compare (4) and (20), for example.

Another case for which the same three readings which are illustrated in (20) are possible is the following.

- (21) Sit down in that chair and I'll bake you a dumpling.

The consequential reading of this sentence is paraphrased by (22).

- (22) If you sit down in that chair I'll bake you a dumpling.

The sequential reading does not involve any causal relationship between the request and the activity.

- (23) Sit down in that chair, and (then (while you are sitting)) I'll bake you a dumpling.

The juxtapositional reading is difficult to get for this sentence: it is most closely given by reversing the order of the conjuncts in (21).

- (24) I'll bake you a dumpling, and sit down in that chair.

In general it sounds strange to conjoin an imperative with a declarative, particularly if there is no particular connection between the two, aside from their being uttered in the same sentence. However, examples are of varying acceptability depending on the context in which they are or may be used. E.g.,

- (25) Albert is coming for dinner, and don't forget to send out the laundry.

Therefore it is possible to say that the conjunction *and* in principle has three readings.<sup>3</sup>

<sup>3</sup> It may also be possible to find cases of constituent conjunction which have the three readings referred to. For example,

The readings which we have been discussing seem to be due to a systematic ambiguity of the conjunction *and*. Furthermore, the consequential reading appears to be a special case of the sequential reading, occurring when a causal relationship between the two events is possible. In the absence of evidence to the contrary it is always possible to interpret the second event as following the first event in time; given the appropriate context it may also be concluded that the second follows from the first. Which readings are possible in given cases depends, of course, on the context established by the clauses themselves.

On the basis of these general observations concerning the interpretations of *and* when it conjoins sentences describing events, we can account for two of the three readings of the *and*-OM-sentences. Assuming that the NP represents some event involving it, then if the S involves an event explicitly, the entire sentence may have either the sequential reading or the consequential reading. The relationship between the juxtapositional reading of the full conjoined sentences and the incongruence reading of the OM-sentence is not quite as clear, however.

Note that the incongruence reading is possible with the full conjoined sentences also. In order for this to be the case the right-hand conjunct must have an exaggerated stress contour.

(26) John has two cases of beer, and *I'm going home*.

From this we could conclude that there is a fourth reading for the conjunction *and*. However, we must observe that it is through the presence of the emphatic stress contour that the second clause is linked with the first in (26). Otherwise there is no necessary connection between the two at all, and the juxtapositional reading is possible. So we may conclude that the juxtapositional reading has two variants: (a) pure juxtaposition, where there is no connection between the two clauses aside from their being uttered in the same sentence, and (b) linked juxtaposition, or incongruence, where abnormal stress is present, and as a consequence some notion of exceptionality is associated with the fact of juxtaposition itself.

From all this we may say that there are at least three constraints on the interpretation of the *and*-OM-sentences: (a) the NP represents an event involving the NP, (b) the S describes an event, and (c) there is some link

(i) John burned the match and the building.

Under one reading the burning of the building is a consequence of the burning of the match. Under another reading the burning of the building follows the burning of the match, but is not directly related to it. Under the third reading both events have taken place, but no claim is made as to their relative occurrence in time.

It is an open question whether (i) should be considered to be derived by conjunction reduction from sentential coordination, or whether these readings can be directly associated with constituent coordination.

between the two events. The word ‘link’ here is used in a rather abstract way, meaning a temporal relationship, a cause–effect relationship, or the relationship expressed by the incongruence reading, which we might refer to as a ‘mental’ relationship.

#### 2.2.4 Or-OM-sentences

We remarked in §2.1.1 that *or*-OM-sentences could have only one reading. If we consider *or* at the level at which we have been considering *and*, this fact becomes surprising, since there are a number of logically possible interpretations for sentences with *or*. The question is whether the set of meanings of a sentence of the form *S or S* is coextensive with the set of logical equivalences of the sentence. Consider the following example.

(27) John will close the window or Bill will freeze.

The point which I would like to make here<sup>4</sup> is that the meaning of the sentence is more than the logical structure of the sentence. A simple demonstration of this is the result of reversing the order of the clauses in (27). The truth values remain the same, but the meanings change decidedly.

(28) Bill will freeze or John will close the window.

Another logical equivalent is (29)—

(29) If John closes the window Bill won’t freeze and if John doesn’t close the window, Bill will freeze.

—and so is (30),

(30) If Bill freezes then John won’t close the window and if Bill doesn’t freeze then John will close the window.

What is going on, evidently, is that the logical properties of implication are not the same as the properties of conditionals as they are used conventionally. It is correct to say, I think, that the meaning of *or* is more than its truth table would suggest: there is some sense of relatedness between the events described by the clauses. Furthermore, this relationship is such that the meaning of the sentence changes when the order of clauses is reversed.

With this in mind it is easy to see why sentences like (31) and (32) mean what they do.

(31) Stay home or Bill will leave.

<sup>4</sup> This is certainly not the first time that this point has been made.

- (32) One more can of beer or I'm going home.

Since these sentences also have the interpretation that the clause to the right is somehow dependent on the clause or NP to the left, it is natural to attribute this to the fact that in general this is a property of clauses conjoined by *or*. The alternative, that these sentences are derived from an underlying *if-then*, is difficult to justify, owing to the fact that an *if-then* fails to represent the imperative nature of what is found to the left of the *or*. While logically the clauses are reversible, this characteristic of the left conjunct results in a different interpretation. If we paraphrase the above sentences by an *if-then* construction we get something like the following.<sup>5</sup>

- (33) If you don't stay home Bill will leave.

- (34) If you don't give me one more beer I'm going home.

It will be recalled that the essential problem with OM-sentences is that while the *and*-OM-sentences had certain characteristics of conditionals, the *or*-OM-sentences did not. This was found to be surprising in view of the fact that the conditional interpretation, of which (34) is a sample, appearing to provide a reasonable paraphrase for both types of sentence.

Now, however, if we reinterpret (34) as being not a paraphrase, but a logical inference from an *or*-OM-sentence, then we will have a reasonable means of accounting for this data.

Let us now make the following assumption: the analysis of *and*-OM-sentences is such that at some level of their representation the rules which permit the occurrence of *any* in conditionals will also permit the occurrence of *any* in *and*-OM-sentences.<sup>6</sup> That is, the acceptability of (35) below is directly related to the acceptability of (36), just as the interpretation of (35) is related to the interpretation of (36),

- (35) Any more beer and I'm leaving.

- (36) If you drink any more beer I'm leaving.

<sup>5</sup> Notice that it is not clear how one would go about determining which *if-then* should be chosen to underlie these sentences, since certainly a number of logical relationships may be said to apply between the clauses. From (i) we may infer (ii) or (iii), for example.

(i) Give me a beer or I'll call a cop.

(ii) If you give me a beer I won't call a cop.

(iii) If you don't give me a beer I'll call a cop.

<sup>6</sup> I have stated this assumption in the most general way possible, in order not to prejudice the discussion by creating particular analyses at this point.

A similar relationship can be seen to hold between (37) and (36) at some level of representation.

(37) Drink any more beer and I'm leaving.

It is immaterial for this discussion at present whether or not (35) and (37) are derived from the same deep structure as (36). Whatever the level is at which we wish to account for the presence of *any*, we are assuming that these three sentences are identical at the level with respect to the rule in question.

If we consider now (31) and (33) we see that (33) cannot be a representation for (31) at any level, since if it were we would expect to find the same behavior as we do in the case of (35)–(37). We would expect that *any* would be acceptable in an *or*-OM-sentence if (33) was a representation of (31), because at the level of (33) there is no formal difference between it, and, say, (36). In particular, we would expect to relate (38) and (39).

(38) If you don't drink any more beer I'm leaving.

(39) \*Any more beer or I'm leaving.

On the basis of this we must conclude that (39) does not contain *if* or any element which corresponds to it at the level at which the acceptability of *any* is determined.

It would seem to be the case, in fact, that at this level the *or*-OM-sentence shares more of the characteristics of imperatives, and not conditionals. For example, we can insert *please* into an *or*-OM-sentence or a sentence like (37), but not into an *and*-OM-sentence, or an *if-then* conditional.

(40) One more beer, please,  $\left\{ \begin{smallmatrix} \text{or} \\ * \text{and} \end{smallmatrix} \right\}$  I'm leaving.

(41) Give me one more beer, please,  $\left\{ \begin{smallmatrix} \text{or} \\ * \text{and} \end{smallmatrix} \right\}$  I'm leaving.<sup>7</sup>

(42) \*If you (don't) give me one more beer, please, then I'm leaving.

Another interesting point is that while a conditional and an *and*-OM-sentence may have truth value, an *or*-OM-sentence cannot. Hence it seems

<sup>7</sup> Further evidence that sentences like (41) with *or* are underlying imperatives is that they can take tags, while the sentences with *and* cannot.

(i) Give me some more beer, will you,  $\left\{ \begin{smallmatrix} \text{or} \\ * \text{and} \end{smallmatrix} \right\}$  I'm leaving.

Sentence (i) with *and* is acceptable if it is assigned the juxtapositional reading, but not the consequential. Of interest in this regard is whether (ii) is acceptable.

(ii) Some more beer, will you, or I'm leaving.

I myself find (ii) to be understandable, but marginal in grammaticality. It is quite sobering to contemplate what the consequences for the grammar of English would be if (ii) were to be judged grammatical; however, this factor has played no role in my judgment.

unlikely that a conditional could even be an adequate paraphrase for an *or*-OM-sentence, let alone underlie it.

Let us summarize what we have determined to this point. We have demonstrated that the tripartite interpretation of *and*-OM-sentences can be correlated with a more general tripartite interpretation of conjoined structures linked by *and*; hence we have concluded that the conjunction *and* may be interpreted in one of three ways when it conjoins sentences expressing events. We also demonstrated that one of these readings, the consequential reading, possesses some of the properties of conditional *if-then* sentences.

Upon examining *or*-OM-sentences we discovered that there was only one interpretation of sentences linked by *or*, and that these sentences bore several properties of imperatives. Again it was shown that the properties of *or* could be found in sentences which were more elaborate in structure than the OM-sentence. In a nutshell, it is no accident that the OM-sentences have the interpretations they do. What may be more surprising is that they have any interpretations at all, as we shall see.

### 2.3 What can a consequential OM-sentence mean?

Let us consider now in a preliminary fashion what the range of paraphrases of a consequential OM-sentence is. Concerning this question in Culicover (1970), I said "Given any situation . . . , this situation can be used as a potential condition under which the proposition [represented by the S] will be true." As an example I gave sentence (1), and a number of possible paraphrases.

(1) One more can of beer and I'm leaving.

(43) 
$$\left. \begin{array}{l} \text{If } \left\{ \begin{array}{l} \text{you give me} \\ \text{I get hit by} \\ \text{I see} \\ \text{I hear about} \\ \text{you buy} \\ \text{John crushes} \\ \text{anybody drinks} \\ \dots \end{array} \right\} \end{array} \right\} \text{one more can of beer, I'm leaving.}$$

(44) 
$$\begin{array}{l} \text{If one more can of beer} \end{array} \left\{ \begin{array}{l} \text{hits me} \\ \text{explodes} \\ \text{rolls in front of me} \\ \text{hits you} \\ \text{hits anyone} \\ \text{comes out of the darkness} \\ \dots \end{array} \right\} \text{I'm leaving.}$$