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Edward A. F. Gibson, *Syntax: A cognitive approach*. Cambridge, MA: MIT Press, 2025. Pp. vii + 366.

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The word 'cognitive' has been used quite widely in connection with mainstream syntax over the decades, but it has not always meant very much. In the present book, it is meaningful. The author is a cognitive scientist, and he brings the goals and methods of cognitive science to the subject. The result is a book that is rather different from traditional introductions to syntax such as Radford (2009). But future introductions could well resemble it in important ways.

The book consists of an introduction, nine core chapters, and a brief conclusion. The introduction explains the idea that sentences have structure and in particular that they involve dependencies. It also says something about large language models, which would not have figured in an introduction to syntax a few years ago, but will probably need to be the subject of some discussion from now on.

Chapter 2 focuses on grammaticality and acceptability, especially the many different sources of unacceptability, and the ways in which they can be investigated and disentangled. It is much more concerned with these matters than traditional introductions to syntax, and it seems likely that they will loom larger in syntactic research in the future, as linguistics and psychology draw a little closer together. Psychologists can learn things from linguists, but the reverse is also clearly true.

In Chapter 3, Gibson introduces the dependency grammar framework, which he draws on in the following chapters. Whereas a constituency framework sees phrases with certain immediate constituents as central to syntax, a dependency framework sees syntax as a matter of words having other words depending on them, and a phrase is just a word and all the words depending directly or indirectly on it. Gibson looks at a variety of areas of syntax and argues, among other things, that auxiliaries and complementizers are heads taking a verbal dependent while determiners are dependents of a nominal head. He also discusses coordination and unbounded dependencies. I will say something about the former below.

Chapters 4 and 5 consider the role of dependency locality in connection with both linguistic performance and the content of grammars. In Chapter 4, Gibson explores many different ways in which a preference for shorter dependencies manifests itself

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in performance. For example, where some sentence types allow two different orders, the one that gives shorter dependencies is preferred. Thus, (1a) is more likely to occur than (1b):

(1) (a) Mary threw away the important documents that she brought home yesterday.
(b) Mary threw the important documents that she brought home yesterday away.

An important point that Gibson makes here is that dependency length is not just a matter of the number of words between head and dependent. The precise nature of the words can also be important.

In Chapter 5, Gibson looks at the way grammars have properties which minimise dependency length. For example, languages commonly display harmonic word orders with different heads and dependents ordered in the same way. This is a straightforward consequence of pressure to minimise dependency length.

In Chapter 6, Gibson looks at legal language, which shows far more tolerance of lengthy dependencies than other genres, something which he suggests is 'somewhat of a mystery'.

Chapter 7 considers a number of alternative approaches to syntax, including Construction Grammar and Combinatory Categorial Grammar. Then, Chapter 8 focuses on mainstream Chomskyan ideas about syntax. This is one of the most important parts of the book. It identifies as a key weakness of mainstream syntax the largely unquestioned idea that the superficial structure of sentences is the end product of long and complex derivations. This made accounting for the acquisition of grammars more challenging than it needed to be and led to the idea that there must be a language faculty of some complexity. Without complex derivations, acquisition is much less of a challenge, and hence the case for a complex linguistic faculty is much weaker. Gibson looks especially at polar interrogatives, which have figured prominently in discussions of these matters. If they are the result of movement, there seems to be a problem about how speakers know that the interrogative counterpart of (2a) is (2b) and not (2c):

(2) (a) The boy who is walking away is kicking a ball
(b) Is the boy who is walking away kicking a ball?
(c) *Is the boy who walking away is kicking a ball?

But if there is no movement, the situation is fairly simple. In declaratives, auxiliaries, like other verbs, are preceded by their subject and followed by their complement, but in interrogatives, they are followed by both subject and complement. There is no obvious mystery about how this could be learned. Gibson also argues in this chapter against syntactic accounts of island phenomena, adding to the substantial literature on this subject.

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Chapter 9 is concerned with language and thought. Gibson shows that there is evidence for the locus of the language network in the brain and argues that a lot of thinking does not involve the language network. He concludes that '[t]hought is independent of language…. our complex thoughts are not equal to language: Language is just the vehicle for communicating them to others. We think the thoughts without language' (254). He also shows that there is evidence for a weak Whorfian view of relation between language and thought.

Chapter 10 introduces the noisy channel view of communication. It highlights the fact that hearers may not hear what was said correctly and the fact that speakers may not say what they meant to say or what they would have said if their grasp of the language had been better. All this means that utterance interpretation involves complex processes of inference above and beyond those that have been the focus of research in pragmatics. Gibson links this matter to the relation between SOV and SVO orders, suggesting that SOV is, in a sense, the most natural order, but that SVO is favoured by noisy channel considerations. If either subject or object is missing in an SOV language, what the remaining nominal is may only be made clear by case-marking. In an SVO language, if either is missing, the position of the remaining NP with respect to the verb shows whether it is a subject or an object, and there is less motivation for some form of case-marking.

There are many issues raised in this book which could be discussed at length. I will comment on just two. Most theories of syntax assume a constituency approach. Thus, an important question is: How satisfactory is the dependency approach favoured by Gibson? Any constituency framework in which an expression can select a sister has a notion of dependency. Thus, the findings about dependency locality that are Gibson's main focus do not necessarily provide an argument for a dependency approach. But simplicity might provide an argument. Other things being equal, an approach having just a dependency relation is simpler than one having both constituency and dependency relations. But probably most syntacticians would think a dependency approach is too simple.

The idea that there is no need for a notion of phrase that is more than just a word and its dependents is most plausible with phrases which have all the properties of their heads apart from the fact that the head takes a complement or complements. Thus, a typical prepositional phrase such as *on the table* is unproblematic for a dependency framework.

There are, however, prepositional phrases which seem to share some properties not with their head but with a non-head daughter, e.g. the bracketed phrase in the following:

(3) someone [on whom] you can rely

This is the sort of phrase that can introduce a relative clause because it contains the relative pronoun *whom*, but *whom* is not the head of the phrase. On the face of it, then, phrases can have properties reflecting a non-head daughter, and this might suggest that they are more than just a word and its dependents. However, there is a

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simple solution, stemming from Ginzburg & Sag (2000: 188–203). One can simply assume that a head can inherit certain features from a dependent. This will allow *on* in *on whom* to have a different feature makeup from *on* in *on the table*, and the different distribution of the two expressions is unproblematic.

A different issue arises from the fact that there are phrases which seem not to have a head (so-called exocentric phrases). If this is the case, not all phrases can be just a head and its direct and indirect dependents. Coordinate structures have commonly been viewed as having no head. Within Minimalism, it has often been proposed that the conjunction is the head and hence that they are conjunction phrases. However, as shown in Borsley (2005), this view faces a variety of problems. One is that the distribution of coordinate structures depends on the identity of the conjuncts: A coordination of nominal conjuncts appears in nominal positions, a coordination of adjectival conjuncts appears in an adjectival position, and so on. Gibson discusses coordinate structures quite briefly. He appears to suggest that they are headed by a conjunction and that conjunctions are heads that derive properties from their dependents. So they are nominal if the dependents are nominal, adjectival if the dependents are adjectival, and so on. This will probably handle the distribution of coordinate structures, but it makes conjunctions quite unusual heads. They are also unusual in another way. Coordinate structures can contain an unlimited number of conjuncts. Thus, a coordinate structure with a single conjunction will be a head with an unlimited number of dependents, all but one of which precede it. This is quite unlike typical heads. There are also coordinate structures where all except the first conjunct is preceded by a conjunction. One might propose that each conjunction in these is the head of the conjunct it introduces. But this would leave the coordinate structure without any obvious head. Thus, it looks like there is a real problem here.

Interestingly, the possibility that coordination may be problematic for dependency grammar was noted not long ago in a paper by Gibson and his colleagues. Futrell, Levy & Gibson (2020) comment that,

> some constructions forming constituents are exocentric, having no head. For example, it is notoriously difficult to assign a head to a coordinated phrase such as *Bob and Mary* …, with different dependency formalisms choosing different means …, and some introducing elements of phrase structure formalisms especially for this purpose … (373)

They also say this:

> [W]hile we use a dependency formalism, we do not wish to claim that dependency grammar is the only correct description of syntax, nor that a dependency tree encapsulates all of the syntactic information that there is to know about a sentence. We only wish to claim that dependency trees represent an important and large subset of that information. (373)

These remarks strike me as sound. Dependency locality is undoubtedly important in connection with both linguistic performance and the content of grammars,

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but it doesn't follow that dependency grammar is the right approach to take. Any approach that has a well-developed notion of dependency ought to be able to accommodate the facts that Gibson is concerned with, and this would seem to include the main current constituency-based frameworks. Dependencies have a somewhat different character in such frameworks. Dependents are generally phrases not words, and their heads only depend indirectly on the higher head. Moreover, heads may be not words but phrases. For example, it is generally assumed that subjects in typical English clauses depend on a following verbal phrase. However, it is not obvious that this needs to be a problem.

Another, very different issue that arises here is the potential relevance of the book to syntax courses in Linguistics departments. For many linguists, the fact that it has no exercises would exclude it as a candidate for the main text in such a course. However, it could be a very useful additional text. Even if dependency grammar is problematic, dependencies are important, and the observations set out here could be a part of any introduction to syntax. The critique of mainstream syntax also deserves a hearing in any introduction. Some of the concerns of psychology that loom large here are also very relevant. They are likely to become increasingly influential in linguistics. As noted by D'Alessandro (2019), mainstream syntactic theory has tended to ignore work in neighbouring fields like psychology, and these fields have reciprocated by taking little notice of mainstream syntax. But this seems to be changing. One recent book, Chaves & Putnam (2020), is concerned with a careful investigation of the sources of acceptability judgments and with the development of analyses that fit with what is known about linguistic performance. Thus, Gibson's book, which has these matters at its heart, looks very timely. Prediction in an academic discipline is a risky business, but it seems a fairly safe bet that future introductions to syntax will look rather more like this book and less like traditional books such as Radford (2009).

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