Trends in Cognitive Sciences

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Letter Response

Evidence supports constituency-based syntax, movement, and unpronounced elements

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Reassessing Gibson's case against constituency-based accounts

Gibson advocates dependency grammar [1], contrasting it with constituency-based accounts that posit movement and phonologically null (unpronounced) syntactic elements [2,3]. Dependency grammar represents sentence structure through word-to-word relations, whereas constituency-based accounts represent sentence structure by grouping words into larger hierarchical constituents. Movement accounts for cases in which a constituent appears in one position but is interpreted in another. For example, in '*Who did you call?*', '*Who*' appears sentence-initially but is interpreted as the object of '*call*'; this is analysed as movement from the object position to the sentence-initial position.

Gibson claims that the available evidence favours dependency grammar and that the evidence for constituency-based accounts positing movement and unpronounced elements is weak. These claims are unwarranted. Gibson overlooks a substantial body of research supporting these constituency-based accounts. Some of this research directly challenges the arguments he presents in favour of dependency grammar; other work identifies phenomena that are more naturally captured by constituency-based accounts. In the following sections, I clarify these points and offer a more balanced assessment of the evidential landscape relevant to the debate that Gibson raises.

Relative clauses with fronted and stranded prepositions

One piece of evidence that Gibson takes to favour dependency grammar concerns a processing contrast between relative clauses with fronted and stranded prepositions. Relative clauses are easier to process when prepositions are fronted, as in 'This is the saucer on which Mary put the cup into which she poured the milk', than when prepositions are stranded, as in 'This is the saucer which Mary put the cup which she poured the milk into on' [4]. Gibson argues that accounts positing unpronounced elements incorrectly predict comparable difficulty for the two sentence types.

This claim is unwarranted. Previous work has shown that accounts positing unpronounced elements can capture the contrast once the incremental, real-time nature of language comprehension is taken into account [5].

Subject island effects

Another argument Gibson advances concerns subject island effects—the unacceptability of subextraction from subjects—as illustrated by the attempted extraction of '*Which man*' in '*Which man did Mary say a friend of __ invited her?*'. Gibson appeals to a recent finding [6] suggesting that subject island effects are absent in relative clauses. Gibson uses this finding to motivate a discourse-based account of subject island effects [6] and to argue against movement-based syntactic explanations.

However, methodological concerns have been raised about the findings in [6], with subsequent work demonstrating that, once relevant confounds are controlled for, subject island effects reliably emerge across a range of constructions, including relative clauses [7]. This weakens Gibson's conclusion: the available evidence instead supports movement-based syntactic explanations and poses a challenge for the discourse-based account.

Scope ambiguity

Beyond the specific pieces of evidence Gibson presents, several phenomena are more straightforwardly captured by constituency-based accounts than by dependency-based accounts. One such phenomenon is scope ambiguity [8,9]. For instance, the sentence '*I did not leave because it rained*' permits two interpretations: either '*I stayed because it rained*' or '*I left for a reason other than the rain*'. However, when the *because*-phrase is sentence-initial, as in '*Because it rained, I did not leave*', this ambiguity is markedly reduced. This contrast can be naturally accounted for by assuming that interpretation is sensitive to the hierarchical relation between the *because*-phrase and the negator (see the top panel of Figure 1).

Psycholinguistic evidence for unpronounced elements and movement

Psycholinguistic research supports syntactic representations involving unpronounced elements and movement. For instance, evidence from spoken production shows that, when speakers produce a sentence such as '*I hope everyone is happy*', they mentally represent an unpronounced complementiser introducing the embedded clause [10]. Evidence from reading comprehension also shows that the movement of a wh-phrase is reflected in unpronounced syntactic structure, as in '*I do not know who ~~Mary said ___ that...~~, but Mary said that...*', where the struck-through material represents unpronounced structure and the underline marks the position associated with '*who*' [11]. Such findings are consistent with accounts positing unpronounced elements and movement but are not straightforwardly accommodated by dependency-based accounts (see the bottom panel of Figure 1).

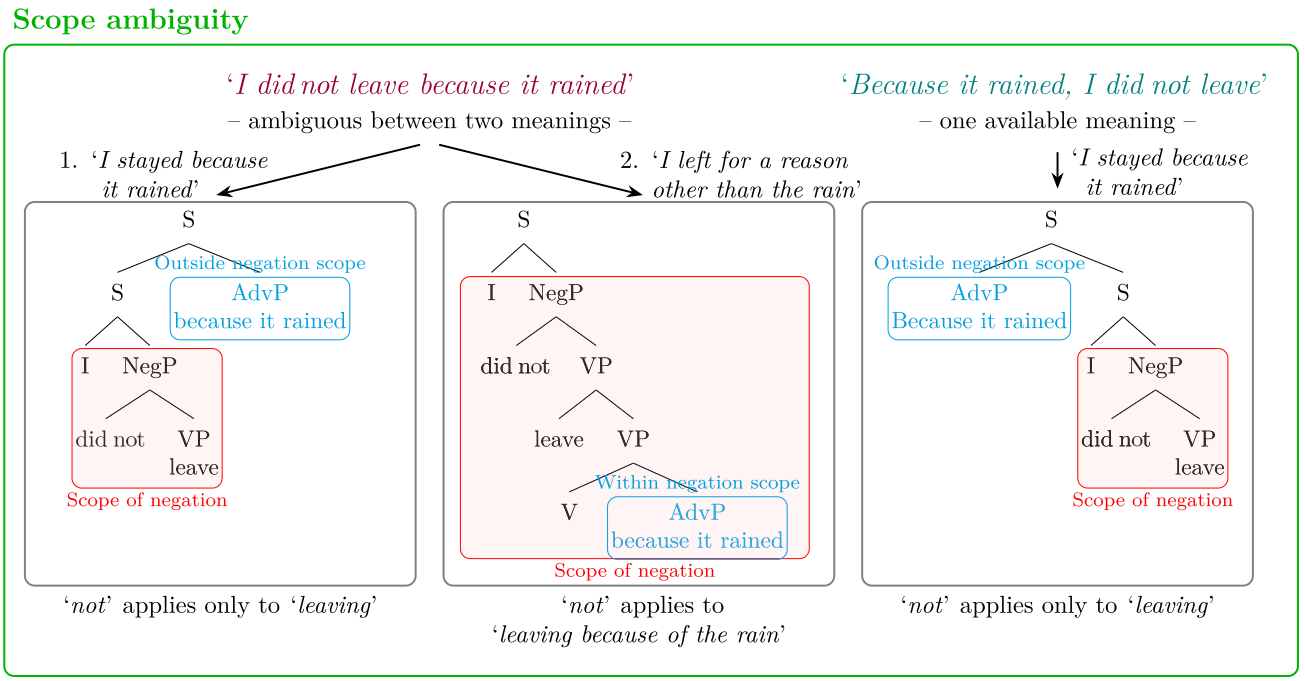


Figure 1. Schematic illustration of scope ambiguity and psycholinguistic evidence for unpronounced elements and movement. The top panel illustrates how the hierarchical position of the *because*-phrase relative to negation corresponds to the available interpretations. The bottom panel illustrates evidence from spoken production for the encoding of an unpronounced complementiser and from reading comprehension for the construction of unpronounced syntactic structure and wh-movement. The symbol ∅ denotes an unpronounced complementiser. The red arrow represents movement of the wh-phrase '*who*', and the dark-cyan-shaded material following '*who*' represents unpronounced syntactic structure. AdvP: adverbial phrase; NegP: negation phrase; S: sentence or clause; V: verb; VP: verb phrase.

Concluding remarks

Research on grammar has drawn on a pluralistic evidential base, including introspective experimentation based on researchers' own linguistic judgements, observational and comparative analyses of recurrent patterns across constructions and languages, and formally controlled participant-based experiments. All these sources have contributed to the development of grammatical theory, and none has a privileged status in principle. The phenomena discussed in this article form only part of this broader evidential landscape, from which syntactic properties such as hierarchical constituent structure, movement, and unpronounced elements have received converging support [12]. Gibson's claim that accounts positing these syntactic properties have weak empirical support is therefore untenable, whether these accounts are considered on their own or in comparison with dependency grammar.

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