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Processing *let alone* coordination in silent reading

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Abstract

Processing research on coordination indicates that simpler conjuncts are preferred over more complex ones, and that positing ellipsis structure in the second conjunct is taxing to process when a simpler non-ellipsis structure exists. The present study investigates *let alone* coordination, which is argued to require clausal ellipsis in the second conjunct. It is proposed that the processor always projects a clausal structure for the second conjunct for the ellipsis, obviating a general preference for a less complex conjunct. Experiment 1 consists of several sentence-completion questionnaires testing whether a DP or VP conjunct is preferred in *let alone* structures as in *John doesn't like Mary, let alone* (*Sue* | *love her*). The results found a bias towards VP remnants that was weakly affected by syntactic placement of the focus particle *even*, as well as by prior context. Experiment 2 examined the effect of remnant type on eye movements during silent reading, revealing only distinct processing patterns, rather than major processing penalties, for different remnant types, and a general facilitation when *even* was present to signal upcoming scalar contrast.

Keywords: Sentence processing; Ellipsis; Coordination; Eye movements; Focus particles

1. Introduction

There is much evidence that as an utterance unfolds the sentence processor actively seeks to assign an appropriate structural analysis as quickly as possible to meet real-time constraints on computation. In the case of (temporary) ambiguity involving coordination, previous research has shown that less complex structures are typically preferred over more complex ones, at least out of context – although this preference may be encoded within models of the processing system in multiple ways (e.g., as a syntactic economy constraint on structure building, as in Frazier's 1979 garden path model, or as a pressure to minimize discourse topics, as in Hoeks et al., 2002, to take just two possibilities among many).

Further, preferences that guide the processing of ambiguous sentences implicitly reveal which underlying structures are considered possible or likely by the processor at various junctures within the sentence. Such preferences are especially important when the processor must infer covert structure on the basis of overt form as in the case of ellipsis; here, I take *mandatory ellipsis* after focus-sensitive coordination as a novel case study, investigating whether the more complex clause structure required for ellipsis necessarily obviates a preference for simpler alternatives.

Focus-sensitive coordination refers to a unique class of coordinators that include *let alone*, as in (1a), *much less*, and possibly others, such as *never mind*. In line with Hulsey (2008) and Toosarvandani (2010), I will argue that such structures always elide material from the second conjunct, so that (1a) may be roughly spelled out as (1b), a view to be

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defended later. The <> symbols demarcate an elided string, and CAPS indicates linguistic focus, though explicit pitch accent is not manipulated or specified in the experiments that follow.

(1) a. John can't run a MILE, let alone a MARATHON.
b. John can't run a MILE, let alone [a MARATHON]$_1$ <John run t_1 >.

Ellipsis is licensed primarily in coordination environments (Ross, 1967; Sag, 1976; Hardt, 1993), and common coordinators like *and*, *or*, *but*, and so forth have already been well explored. However, it remains open whether all coordination types stand in fundamentally the same relationship with respect to the licensing of ellipsis. For example, certain coordinators, like *but*, might prohibit forms of ellipsis (as suggested for gapping by Sag, 1976). Conversely, coordinators like *let alone* might *require* an elided constituent. It is this possibility that we explore here.

Necessitating ellipsis after coordination might seem to be an unusual requirement for a coordinator; coordination is typically thought to merely permit ellipsis structures like sluicing, stripping, and arguably gapping, without requiring it (e.g., Ross, 1967, 1970).[1] For instance, on the basis of examples like (2) from Siegel (1984), gapping is usually described as an *optional* syntactic process that omits material from the surface syntax which is identical to a correlate in the previous clause. In (2), the gap site includes a verb identical to the matrix clause <*eat*>, leaving the discontinuous constituents *Mary* and *beans* behind.

(2) a. John won't eat CAVIAR and Mary eat beans.
b. John won't eat CAVIAR and MARY <eat> BEANS.

Yet, parallel cases involving coordinate structures with *let alone* (called *let alone coordination* here) show that ellipsis in this case is required:

(3) a. * John won't eat CAVIAR, let alone Mary eat beans.
b. John won't eat CAVIAR, let alone MARY BEANS.

Let alone coordination is unique in several additional respects (Fillmore et al., 1988). First, *let alone* is licensed under negation and other downward entailing environments, much like negative polarity items like *any* or *ever* (Ladusaw, 1979).[2,3]

(4) a. John can't drink TEA, let alone COFFEE.
b. John never drinks TEA, let alone COFFEE.
c. * John drinks TEA, let alone COFFEE.

Second, *let alone* coordination marks the items in comparison with contrastive focus, so that the first item is ranked on a salient scale as more informative than (Fillmore et al., 1988) or contextually entailing (Toosarvandani, 2010) the second. Example (4a), for instance, is understood as presupposing a ranking in which *John's drinking tea* is a less expected or less informative activity than *John's drinking coffee*. This type of scalar reasoning is familiar from scalar implicatures in which a language user draws the (defeasible) inference that a stronger element on a scale cannot be used, given the fact that a weaker one was used instead (Horn, 1972, 1989).

As with scalar implicatures generally, the scalar relations in *let alone* coordination can be extremely variable (Hirschberg, 1985). For example, the scale may be retrieved more or less directly from logical relations holding between the elements in contrast. Examples in (5) illustrate such a scale with numerals (5a) and quantificational expressions (5b). Logically, if John can run ten miles, then he must also be able to run one, and if John drank all of the coffee, then he also drank some of it.

(5) a. John can't run ONE mile, let alone TEN miles.
b. John didn't drink SOME of the coffee, let alone ALL of it.

[1] Many approaches to gapping do not involve ellipsis *per se*, but rather Across-the-board movement with scrambling (Johnson, 1996, among others). However, the precise analysis of gapping will not concern us here, as what matters is ultimately the *size* of the second conjunct, which nearly all approaches treat as larger than what is visible at the surface.

[2] So-called 'positive' instance of *let alone* coordination (3c) are attested in which the *let alone* phrase provides an afterthought, rather than a scalar comparison (Cappelle et al., 2015). Such instances might be limited to specific dialects (Fillmore et al., 1988; Toosarvandani, 2009), and are relatively rare in recorded speech (see Harris and Carlson, in press, for some distributional properties of *let alone* coordination in corpora).

[3] A function F is *downward entailing* iff for all X, Y in the domain of F, such that $X \subseteq Y$: $F(Y) \subseteq F(X)$.