Recursive layering and sentential embedding: A minimalist metric for complexity of grammar and performance

In mainstream generative grammar, comprehending and producing complex sentences is accounted for by recursive application of a generative operation that yields such sentential complexity. Recently, it has been claimed that complex syntax is not a universal property of all living languages (Everett 2005). In subsequent debates, complex syntax is always associated with sentential embedding in general and, in the recent psychological literature, with self-embedded structures in particular (Sauerland & Author 2011). This paper questions the correlation between sentential embedding and complexity by understanding recursion in terms of derivational layering (Zwart 2011). After demonstrating that center-embedded configurations in English and German ((1)-(5)) differ in terms of derivational layers, I will argue, based on recent data, that derivational layering can serve as a metric for predicting cross-linguistic differences in complexity both on the level of grammar and on the level of performance.

In the first part of my paper, I will adopt the operation Split-merge (Zwart 2009), which measures derivational complexity by the amount of derivational layers a configuration requires. I will show that this operation is in principle compatible with other minimalist approaches assuming multiple points of Spell-Out and ‘freezing’ left branches of assembled tree structures (Uriagereka 1999). Concerning center-embedded configurations, I will refute Zwart's (2011) claim that (1) is more complex than both (2) and (3). In particular, only (2) involves less derivational layers than (1) (Author & Lahne to appear).Arguing, in contrast to Kayne (1994), that languages like German show head-final linear order in relative clauses without any movement, I will demonstrate that the operation Split-merge predicts that center-embedded configurations containing self-embedding in a language with head-final order in relative clauses imply the same derivational complexity as center-embedded configurations containing no self-embedding at all.

In the second part of my paper, I will argue that the operation Split-merge gives significance to the non-local dependency between antecedent and relative pronoun and thereby corresponds to the psycholinguistic insight that this relation plays a significant role in affecting relative clause extraposition in languages like German (Shannon 1992; Uszkoreit et al. 1998). Based on recent work (Author et al. to appear), I will show how Split-merge converges with performance preferences we found for self-embedding and for extraposing relative clauses in German. In particular, we found that it is less significant whether the lower relative clause is self-embedded within the higher relative clause, as in (4), or extraposed behind the higher relative clause, as in (5).

Since the paper demonstrates that basic mechanisms proposed within minimalism – the multiple application of Spell-Out and the recursive role of subderivations – are compatible with evidence on the level of performance, I will amend the widespread view that “the MP is highly unappealing from the point of view of human sentence processing” (Ferreira 2005). In particular, I will argue that the derivational role of ‘recursive layering’ can serve as a useful metric by which relative complexity both on the level of grammar and on the level of performance can be computed in a cross-linguistic perspective.
(1) The dog the cat the man kicked bit barked. (contains self-embedding)

(2) The dog that bit the man that kicked the cat barked. (does not contain self-embedding)

(3) The dog that the cat bit that the man kicked barked. (does not contain self-embedding)

(4) Fido, der Hans, der Eva liebt, beißt, bellt. (contains self-embedding)
Fido who Hans who Eva loves bites barks.
‘Fido, who bites Hans, who loves Eva, barks.’

(5) Fido, der Hans beißt, der Eva liebt, bellt. (does not contain self-embedding)
Fido who Hans bites who Eva loves barks
‘Fido, who bites Hans, who loves Eva, barks.’

References


