The ordering of operations in the morphological component: two case studies
Erik Schoorlemmer, Massachusetts Institute of Technology

1. Introduction: The core tenet of Distributed Morphology (Halle & Marantz 1993 among others) is that the morphological component is postsyntactic. This talk argues for a highly articulated derivational approach to this component. The present proposal distinguishes itself from previous ones (e.g. Embick & Noyer 2001) in two respects. First, it proposes a more articulated view of the ordering of operations in the PF-component. Second, it makes a crucial distinction between *inherently* ordered operations and *non-inherently* ordered ones. Inherently ordered operations can only occur in a specific order since the kind of structure needed by the second operation is created by the first operation. The order between two inherently ordered operations is therefore universal. Non-inherently ordered operations operate, however, on the same kind of structure. Therefore, they could in principle apply in either order. I claim that each language makes a choice with respect to the order in which it applies non-inherently ordered operations. This gives rise to crosslinguistic variation.

2. The order of operations: I will assume that the following operations take place in the postsyntactic morphological component: 1. <u>Vocabulary Insertion</u> (Halle & Marantz 1993): matching morphosyntactic feature bundles with actual Vocabulary Items (VIs) 2. <u>Linearization</u> (Embick & Noyer 2001; Nunes 2004): the conversion of syntactic hierarchical structure into a linear string of VIs, 3. <u>Chain Reduction</u> (Nunes 2004): the deletion of lower chain links, 4. <u>Local Dislocation</u> (Embick & Noyer 2001): an operation that inverses a VI with the VI to its right and reanalyzes it as being part of that VI, 5. <u>Head Movement </u>(Chomsky 1995 *et seq.,* among others).

I claim that Vocabulary Insertion, Head Movement and Linearization are inherently ordered with respect to each other. I adopt the view that Head Movement is triggered in order to provide a suffixal head with a host (Lasnik 1981; Harley 2004 among others). Whether a head is a suffix or a free morpheme is information that is provided by the VI inserted in that head. This means that Head Movement must follow Vocabulary Insertion, otherwise its trigger is not yet available. Head Movement is sensitive to syntactic structure, since it can cross specifiers. It therefore takes place before the syntactic structure has been lost as a result of Linearization. Head Movement thus takes place after Vocabulary Insertion, but before Linearization.

Linearization, however, must precede Local Dislocation. As pointed out by Embick & Noyer (2001), Local Dislocation operates only on linearly adjacent elements and therefore has to take place after the syntactic structure has been converted into a linear string.

According to Nunes (2004), Chain Reduction takes place in order to get rid of contradictory linearization statements. A chain consists of copies of the same VI in different positions. Linearization would therefore result in a statement that the same VI both follows and precedes itself, which is conflicting information for phonology. In order to avoid this, Nunes proposes that Chain Reduction takes place. Chain Reduction deletes all the copies of the chain except one, resolving the contradictory statement. In Nunes (2004), Chain Reduction happens before Linearization. This, however, entails an unwanted look-ahead. Chain Reduction takes place before Linearization in order to avoid a problem that only arises at Linearization. I therefore propose that Chain Reduction takes place after Linearization, repairing contradictory linearization statements before they are actually pronounced.

Although they both take place after Linearization, Chain Reduction and Local Dislocation are not inherently ordered with respect to each other. Both operations have a linear string of VIs as their input. There is no principled reason to assume that one of them has to apply first.

Combining these conclusions, the order of operations is thus as in (1), in which '>' indicates inherent ordering, while '↔' indicates non-inherent ordering.

(1)   VOCABULARY INSERTION>HEAD MOVEMENT>LINEARIZATION>CHAIN REDUCTION↔LOCAL DISLOCATION

The ordering of operations in (1) straightforwardly accounts for a wide range of phenomena. In order to support the proposal, I will discuss two different case studies that illustrate inherent and non-inherent orderings of operations.

3. Danish vs. Swedish definiteness marking: In unmodified DPs, Swedish and Danish both mark definiteness on the noun through means of a suffixal article, (2a-b). In DPs containing an adjective, Swedish definiteness marking, however, differs from its Danish counterpart. In Swedish, the definiteness suffix is doubled by a freestanding determiner, (2c). In Danish, there is no article doubling. Definiteness is only expressed by a freestanding definite article, (2d).

(2) a. *hus-et*　　　　　　　[Swedish]　　b. *hest-en*　　　　　　　[Danish]
　　　　　house-DEF　　　　　　　　　　　　　horse-DEF
　　　c. **det** *stora* *hus-et*　[Swedish]　　d. **den** *røde hest*　　[Danish]
　　　　　DEF big　house-DEF　　　　　　　　　the red horse

I claim that this crosslinguistic variation is caused by a difference in ordering between Chain Reduction and Local Dislocation. As argued above, these operations are not inherently ordered. They can therefore vary from one language to another.

Following Roehrs (2009), I adopt a syntactic analysis for the definite DPs in (2c-d) in which the definite article moves over the adjective from a low position to a high D-position, (3).

(3)　　[DP [D def. article] [[adjective] [artP [art def. article] [NP noun]]]]

In Swedish, both the higher copy and the lower copy are spelled out, resulting in article doubling. In Danish, only the higher one is pronounced. The question is why this should be so. I argue that the suffixal article in both languages is combined with the noun through Local Dislocation. In Swedish, Local Dislocation precedes Chain Reduction. The lower copy of the definite article will first undergo Local Dislocation. As a result, the lower copy will become part of the noun. Given that morphological reanalysis bleeds Chain Reduction (cf. Nunes 2004), the lower copy is then invisible for Chain Reduction, leading to a double spell-out. In Danish, Chain Reduction, however, precedes Local Dislocation. The lower copy of the definite article will therefore be deleted before Local Dislocation applies. This results in the absence of article doubling.

4. The identity requirement on Head Movement out of an ellipsis site: Head Movement out of an ellipsis site is a subject to a strict lexical identity requirement: the verb that moved out of the ellipsis site needs to be identical to its antecedent (Doron 1990; McCloskey 2007; Goldberg 2005; Gribanova 2009). Above, I argued that Head Movement is inherently ordered after Vocabulary Insertion. On the assumption that ellipsis is non-insertion of VIs (Wilder 1997; Bartos 2000), this ordering straightforwardly accounts for this identity. It is well known that the ellipsis site needs to be interpreted in some sense identical to its antecedent (cf. Merchant 2001 among others). Given that ellipsis is associated with Vocabulary Insertion, it precedes Head Movement. A head that undergoes Head Movement out of the ellipsis site is therefore subject to the same identity requirement imposed on elements in the ellipsis site.

5. Conclusion: As demonstrated by the two case studies, an articulated view of the operations in the morphological component offers interesting new insight into phenomena that previously were thought to be syntactic. If time permits, I will show that it sometimes also worthwhile to take the inverse perspective, i.e. reanalyzing what is thought of to be morphological as a syntactic phenomenon, by providing an account for the distinction between Germanic strong and weak adjectival inflection. In this way, the present paper is an argument for a better integration of morphological and syntactic research.

References: Bartos H. (2000). 'VP-ellipsis and verbal inflection in Hungarian.' In: *Acta Linguistica Hungarica* 47. 3-23. **Chomsky N. (1995).** *The Minimalist Program.* MIT Press. **Doron, E. (1990)**. 'V-movement and VP-ellipsis.' Ms., The Hebrew University of Jerusalem. **Embick, D. & R. Noyer** (2001). 'Movement operations after syntax.' *LI* 32.555-595. **Goldberg, L. (2005).** *Verb-stranding VP Ellipsis: A cross-linguistic study.* PhD-thesis, McGill. **Gribanova, V.** (2009). 'Ellipsis and the syntax of verbs in Russian.' Talk, NYU Linguistics Department Colloquium. Feb. 3rd, 2009. **Halle, M. & A. Marantz (1993).** 'Distributed morphology and the pieces of inflection.' K.Hale & S.J. Keyser (eds.), *The view from building 20*. MIT Press. 111-176. **Harley, H. (2004).** 'Merge, conflation and head movement: The first sister principle revisited.' *Proceedings of NELS 34.* **Lasnik, H. (1981).** 'Restricting the theory of transformations: a case study.' N. Hornstein & D. Lightfoot (eds.), *Explanations in linguistics.* Longman. 152-173. **McCloskey, J. (2007).** 'A language at the edge: Irish and the theory of grammar.' Talk, University of North Carolina, Chapel Hill. **Nunes, J.** (2001). 'Sideward movement.' *LI* 32. 303-344. **Roehrs, D. (2009).** *Demonstratives and definite articles as nominal auxiliaries.* John Benjamins.