

## The Composition and Interpretation of *Tough* Movement

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**Puzzles:** Movement of the subject in the *tough* construction (TC) like (1)a shows various puzzling properties (see e.g., Hartman 2009; Hicks 2009 for evidence for a movement analysis like (1)b). First, the subject moves from one Case position to another in (1)b. Secondly, movement of the subject shows both A- and A'-properties: it does not show a WCO effect, as in (2)a, but it can license a parasitic gap, as in (2)b. Finally, it shows (anti)reconstruction effects, as in (3), which appears to indicate that it sometimes leaves a copy and sometimes a trace. I claim that these puzzles can be resolved if we assume that a movement chain of the subject is formed by using an independently motivated process of late merger proposed by Takahashi and Hulse (T&H) (2009). I also suggest that the availability of this kind of late merger has implications for the issue of how much syntax there is in grammar.

- (1) a. The man is tough to please.  
b. [[the man]<sub>i</sub> is [tough [PRO to please t<sub>i</sub>]]]
- (2) a. [No man]<sub>i</sub> is easy (for me) to imagine his<sub>i</sub> mother liking. (Jacobson 1996)  
b. The book is hard to buy without reading pg. (Chomsky 1982:56)
- (3) a. The argument that his<sub>i</sub> student cheated is difficult for [every professor]<sub>j</sub> to dispute.  
b. The argument that John<sub>i</sub> is incompetent is difficult for him<sub>i</sub> to dispute.  
(cf., \*It is difficult for him<sub>i</sub> to dispute the argument that John<sub>i</sub> is incompetent.)

**Proposal:** T&H argue that the restrictor of a determiner (D) can be late merged with the D (wholesale late merger (WLM)). First, I claim that this idea allows us to capture the facts in (3) under the copy theory. In (3)b, the restrictor of the D is merged with the D in a position above the pronoun, as in (4), and hence Condition C is not violated. In (3)a, the restrictor of the D is merged with the D in some position below the quantifier. Secondly, I argue that WLM makes it possible not to assume that the TC subject moves from one Case position to another. In the derivation postulated for (1)a, I claim that the Case assignment requirement of the  $\nu$  in the infinitival clause is satisfied by the D *the*, which is generated in the complement of V, as in (5)a, and that of the matrix T is satisfied by the noun (N) *man*, which is merged with the D in a position that is structurally higher than the  $\nu$ , but lower than the matrix T (e.g., in the AP-adjoined position), as in (5)b (see T&H 2009 for arguments for the idea that both Ds and Ns need Case). Finally, as shown in (5)c, the lower copy of *the* is converted into an object that receives the same interpretation as an individual variable by Fox's (2002) Trace Conversion in (6).

- (4) [[the [argument that John<sub>i</sub> is incompetent]]<sub>i</sub> [difficult for him<sub>i</sub> to dispute [the]<sub>i</sub>]]
- (5) a. [ $\nu$ <sub>Case</sub> [please [the]]]  
b. [T<sub>Case</sub> [[the [man]]<sub>i</sub> [tough [PRO to [ $\nu$ <sub>Case</sub> [please [the]<sub>i</sub>]]]]]]]  
c. [[the [man]]  $\lambda x$ . is tough to please [the x]]
- (6) Trace Conversion (adapted from Fox 2002:67)  
Variable Insertion: Det (Pred)  $\rightarrow$  Det [(Pred)  $\lambda y(y = x)$ ]  
Determiner Replacement: Det [(Pred)  $\lambda y(y = x)$ ]  $\rightarrow$  the [(Pred)  $\lambda y(y = x)$ ]

**Evidence:** I argued that the Case assignment requirements of two relevant heads can be satisfied by the TC subject because it is composed of two elements, each of which needs Case. This analysis predicts that if the TC subject does not consist of two elements that need Case, the TC is ungrammatical because the Case assignment requirement of the matrix T cannot be satisfied. I suggest that this prediction is borne out by the fact that expletive *there* cannot be a TC subject, as in (7)a. I assume that *there* is a D and it does not involve an NP complement as its restrictor (see Chomsky 1995 for related idea). Thus, it can satisfy the Case assignment requirement of the  $\nu$ , but not that of the matrix T, as shown in (7)b. In contrast to *there*, pronouns and proper names can be TC subjects. I suggest that this is because they are indeed DPs that consist of a D and an N (see Elbourne 2005 for relevant discussion).

- (7) a. \*There is hard to believe to have been a crime committed. (Chomsky 1981:309)  
 b.  $[T_{[Case]} [there_1 [hard\ to\ [v_{[Case]} believe [there_1\ to\ have\ been\ a\ crime\ committed]]]]]$

**A- and A'-Properties:** Let me first discuss the A-property of movement of the TC subject. Employing Ruys' (2000) and Sauerland's (1998, 2004) analyses of WCO, I suggest that a WCO effect does not arise when an application of WLM is legitimate. Ruys and Sauerland propose that *wh*- and quantificational Ds range over choice functions. They argue that the pronoun in (8)a cannot be bound by the quantifier because the pronoun is of an individual type and cannot be of the same type as choice functions, as in (8)c. Under this approach, a WCO effect is expected to arise when an alleged binder DP moves from a position that is structurally lower than a constituent containing a relevant pronoun and leaves behind a copy of the DP, as in (8)b. I argue that a WCO effect does not arise in the TC, as in (2)a, because the restrictor of the relevant D can be merged with the D in a position that is structurally higher than the constituent containing the pronoun, as in (9)a. As discussed above, lower copies of a D without its restrictor are converted into objects that receive the same interpretation as individual variables by Trace Conversion. Thus, the pronoun in (9)a can be bound by the  $\lambda$ -operator, as in (9)b. T&H argue that an application of WLM is not legitimate in cases like (8)a. If WLM is applied, the N *boy* is introduced into a structure outside of the c-command domain of the Case assigner  $v$ , as in (10), and hence it cannot receive Case. Thus, a WCO effect is inevitable in (8)a. In contrast, a WCO effect does not arise in A-movement cases like (11)a. As in (11)b, the N *boy* can merge with the moved D at the VP-adjoined position, which is above the pronoun, but below the Case assigner T, and hence it can receive Case and the pronoun can be bound by the  $\lambda$ -operator in the resulting representation in (11)c.

- (8) a. ??[Which boy]<sub>i</sub> does his<sub>i</sub> mother like?  
 b.  $[[[which\ boy]_1\ does\ [his_1\ mother\ like\ [which\ boy]_1]]]$   
 c.  $*\exists f \in CF: his\ mother\ like\ f(boy)$
- (9) a.  $[[[no\ [man]]_1\ [easy\ to\ imagine\ his_1\ mother\ liking\ [no]_1]]]$   
 b.  $[[[no\ [man]]\ \lambda x. [easy\ to\ imagine\ his_x\ mother\ liking\ [the\ x]]]]]$
- (10)  $[[[which\ [boy]]_1\ does\ [his_1\ mother\ [v\ like\ [which]_1]]]]]$
- (11) a. [Every boy]<sub>i</sub> seems to his<sub>i</sub> parents to be a genius.  
 b.  $[T\ [_{VP}\ [every\ [boy]]_1\ [_{VP}\ seems\ to\ his_1\ parents\ to\ be\ [[every]_1\ a\ genius]]]]]$   
 c.  $[[[every\ [boy]]\ \lambda x. [seems\ to\ his_x\ parents\ to\ be\ [[the\ x]\ a\ genius]]]]]$

As for the parasitic gap licensing, I assume Nissenbaum's (2000) analysis: a parasitic gap can be licensed if an alleged binder of the gap adjoins to a  $vP$ -adjoined position. I suggest that movement of a relevant D within an infinitival clause is driven by the same feature that drives other types of operator movement. Thus, it can manufacture a structure that is necessary for the parasitic gap licensing.

**Conclusion and Implications:** I argued that the formation of a movement chain of the TC subject involves WLM and that this analysis captures otherwise puzzling properties of the TC. WLM creates a syntactic structure that is ungrammatical as it is, but can be converted into an interpretable object at LF. Thus, the possibility of WLM may be taken to suggest that syntax per se does not have a constraint that regulates an application of Merge, such as the Projection Principle (cf., Lebeaux 1988), but the structure that results from applications of Merge must meet a bare output condition imposed by the semantic component. More specifically, the output structure must be compositionally interpretable.

### Selected References

- Fox, Danny. 2002. Antecedent-contained deletion and the copy theory of movement. *LI* 33:63-96.  
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 Sauerland, Uli. 1998. The meaning of chains. Doctoral dissertation, MIT.  
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