

# Economy and Gradable Grammaticality\*

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## 0. Introduction

An old observation: Some ungrammatical sentences are worse than others.

- (1) a.  $\blacktriangle$  This is the book which I don't know when I read.  
b.  $\star\blacktriangle$  This is the author who I don't know what wrote.

(Notation alert: A half star ( $\blacktriangle$ ) indicates a minor infraction; a full star ( $\star$ ) indicates a major infraction; an asterisk (\*) indicates unquantified ungrammaticality.)

In GB, the difference between (1a) and (1b) has been explained by the Subjacency condition, which assigns the  $\blacktriangle$  to both sentences in (1), and the Empty Category Principle (ECP), the source of the  $\star$  assigned to (1b).

*How should a Minimalist theory of syntax deal with this difference?*

A number of options are conceivable, as there are a number of ways for the Minimalist grammar (as formulated by Chomsky (1995)) to reject a sentence:

- The grammar never attempts to generate it.
- The derivation is cancelled.
- The derivation crashes at an interface.
- The derivation converges, but it is uneconomical.

Of these possibilities, economy seems the most likely tool for producing graduated grammaticality judgments. A derivation cannot crash to a greater or lesser degree; it can, however, be more or less uneconomical. In this paper, I explore the possibility of using the economy condition Shortest Move to account for the range of grammaticality judgments previously described by Subjacency and the ECP.

## 1. Variability of Judgments

The trouble with grammaticality judgments is that they vary widely both between and within speakers. See Schütze (1996) for a harrowing but very entertaining review of the literature on things that can affect judgments.

Variation between speakers, where it cannot be attributed to external phenomena (such as whether the speakers have close relatives who are left-handed [Coward 1989]), is something the syntax should be able to explain structurally. We will see how this can be done for *that*-trace effects.

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Variation within speakers, as well as the general susceptibility of grammaticality judgments to external influences, may mean that economy is the right sort of device to deal with marginal sentences. Critics of global economy, such as Collins (1997), object to its computational complexity (it involves counting, and is therefore unimplementable in a finite-state device). However, if we say that evaluations of marginal sentences are based on a computationally complex part of grammatical competence, then we correctly predict that grammatical *performance* of these evaluations will be erratic.

Still, the variability is troubling. Sobin (1987) asked 42 linguistically naïve subjects to evaluate sentences such as the following:

- (2) a.  $\star\blacktriangle$  Who did you say that kissed Harriet?  
b.  $\star\blacktriangle$  Who did you ask whether loves Mary?

While the ECP predicts that these sentences are equally—and seriously—ungrammatical, only 17.5% of Sobin's subjects rejected sentences like (2a), with *that*, while 97.6% rejected sentences like (2b), with *whether*.

The predictions made by Subjacency and the ECP may not be perfect. However, my purpose here is only to replicate them in a Minimalist framework; we can refine them later. In addition, I will show how the economy-based approach can account for one particular way in which speakers' judgments differ.

## 2. Constructions with two WH-words

- (3)  $\blacktriangle$  This is the book [which<sub>i</sub> I don't know [why<sub>j</sub> I read t<sub>i</sub> t<sub>j</sub>]].  
(4)  $\star\blacktriangle$  This is the library [where<sub>i</sub> I don't know [what<sub>j</sub> I read t<sub>i</sub> t<sub>j</sub>]].  
(5)  $\star\blacktriangle$  This is the author [who<sub>i</sub> I don't know [what<sub>j</sub> t<sub>i</sub> wrote t<sub>j</sub>]].

In GB, each of these sentences violates the Subjacency condition, because each contains a WH-word separated from its trace by two bounding nodes. In addition, (4) and (5) violate the ECP, because the traces of the higher WH-words are not properly governed (under Lasnik and Saito's (1984) definition).

The economy approach:

- WH-words are attracted to COMP by a strong feature (about which more later)
- Shortest Move is a separate principle (similar to Collins's (1997) Minimality), not incorporated into Attract:

(6) **Shortest Move:** Mark as ungrammatical any derivation in which a feature  $F$  of  $\alpha$  is attracted to a target  $K$  when there is a  $\beta$  such that  $\beta$  is closer to  $K$  than  $\alpha$  is and the attracted feature  $F$  is also present on  $\beta$ .

Each of (3)-(5) contains a violation of Shortest Move in that a WH-word is attracted to the higher COMP even though the WH-word that has already moved to the lower COMP is closer. These violations correspond to the Subjacency violations in the GB account.

Why are these violations minor? They are *motivated*. Raising the already-raised WH-words would lead to a crash at LF:

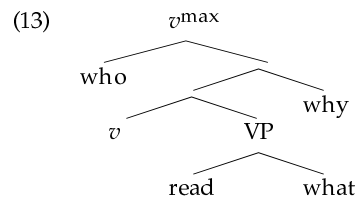
- (7) \*This is the book [why<sub>i</sub> I don't know [t<sub>i</sub> I read which t<sub>i</sub>]].  
 (8) \*This is the library [what<sub>i</sub> I don't know [t<sub>i</sub> I read t<sub>i</sub> where]].  
 (9) \*This is the author [what<sub>i</sub> I don't know [t<sub>i</sub> who wrote t<sub>i</sub>]].

Unlike motivated violations of Procrastinate, violations of Shortest Move committed in order to avoid a crash are ungrammatical, but they are only mildly so.

Sentences (4) and (5) differ from (3) in that they also contain *unmotivated* violations of Shortest Move. Sentences (10)-(12) are analogous to the lower two clauses of (3)-(5):

- (10) I don't know [why<sub>i</sub> I read what t<sub>i</sub>].  
 (11) \*I don't know [what<sub>i</sub> I read t<sub>i</sub> where].  
 (12) \*I don't know [what<sub>i</sub> who wrote t<sub>i</sub>].

If the relative placements of subject, object, and adjunct are as in (13), then Shortest Move accounts for the ungrammaticality of (11) and (12).



The exact structure of the verb phrase is not critical here; the important fact is that subject WH-words are higher than adverbial wh-words, which are in turn higher than object WH-words.

In (11) and (12), and thus in (4) and (5), Shortest Move is violated when the object WH-word is moved instead of the higher (adjunct or subject) WH-word. These violations are unmotivated, because raising the higher WH-word does not cause the derivation to crash:

- (14) I don't know where I read what.  
 (15) I don't know who wrote what.

Unmotivated violations of Shortest Move result in severe ungrammaticality, like ECP violations; motivated violations of Shortest Move result in mild ungrammaticality, like Subjacency violations.

Aside: To my ear, (5) sounds even worse than (4). Two possible psychological reasons for this are:

- In (5), the trace of *who* falls in the middle of the sentence rather than at the end. It is possible to misinterpret *what* as the subject of the lower clause.
- There is a grammatical (though peculiar) sentence that is linearly identical to (4):

- (16) This is the library [where<sub>i</sub> I don't know [what<sub>i</sub> I read t<sub>i</sub>] t<sub>i</sub>].  
 ≈ "Whenever I am in this library, I don't know what I have read."

### 3. Other ECP/Subjacency phenomena

So far, so good, but what about all the other things Subjacency and the ECP were doing for us?

The bounding effects of DPs are still a problem; there may be a way of explaining them by percolation of the attracted feature, and limits on how deeply the grammar can look into a constituent with the wrong specification for that feature.

In the case of *that*-trace effects, economy can account for inter-speaker variation:

- (17) [Which book]<sub>i</sub> did you say [(that) you wanted to read t<sub>i</sub>]?  
 (18) Where<sub>i</sub> did you say [(%that) you found the book t<sub>i</sub>]?  
 (19) Who<sub>i</sub> did you say [(\*that) t<sub>i</sub> wrote the book]?

For Lasnik and Saito (1992), *that* in (19) is ruled out by the ECP. How can we do this in Minimalism, and why is (18) grammatical for some people but not for others?

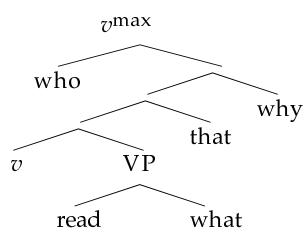
The variable is *that*, so one possibility is that the attracting feature in COMP is not quite sure what it wants to attract.

But in (17)-(19), the moved WH-words are all lower than *that*, and, worse yet, the lower the WH-word, the better the sentence: (17), in which the object moves, is grammatical for everyone; (18), in which an adjunct moves, is grammatical for some people; and (19), in which the subject moves, is ungrammatical for everyone. Is Shortest Move working backwards?

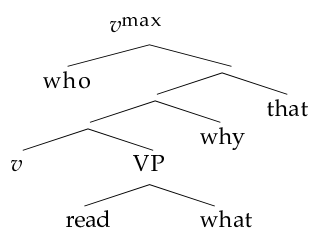
OR: What if *that* doesn't merge as a complementizer, but is attracted to COMP by the same strong feature that attracts WH-words?

(20)

a. Speakers who find (18) ungrammatical with *that*:



b. Speakers who find (18) grammatical with *that*:



The ungrammaticality of the versions of (18) and (19) with *that* arises not from moving the WH-word over *that* into the higher COMP, but from moving *that* over the WH-word into the lower COMP. Speakers who merge *that* below WH-adjuncts find (18) ungrammatical with *that*; speakers who merge *that* above WH-adjuncts find *that* acceptable in (18).

Raising a WH-word across an already-raised *that*—or across any number of already-raised *that*s—is allowed, as in (17) and (21):

(21) This is the book [which<sub>i</sub> I said [that<sub>j</sub> [I thought [that<sub>k</sub> you said [that<sub>l</sub> you had been thinking [that<sub>m</sub> you wanted [to read t<sub>i</sub>] t<sub>m</sub>] t<sub>l</sub>] t<sub>k</sub>] t<sub>j</sub>]].

In order to allow this, we need the attracted feature to be uninterpretable on *that*, so that when a *that* is raised to check the attracting feature in COMP, the attracted feature is also checked, and the *that* is not available for further movement.

How bad is the ungrammaticality caused by inserting *that* in (19) (and [18])? It is not as severe as the ungrammaticality of (4) and (5), because only one violation of Shortest Move is incurred. But is this violation motivated or unmotivated?

Leaving *that* in situ would lead to a crash because of the uninterpretable feature on *that*. However, this is purely a sin of omission, unlike the violations in (8) and (9). For Shortest Move to decide that moving *that* is motivated, it would need to look ahead to see that there will be no other opportunity to check the feature on *that*.

#### 4. Conclusions

The economy approach doesn't account for all ECP/Subjacency phenomena yet, but that's hardly surprising, as there isn't even a consensus on the data.

For the phenomena economy does deal with:

- It implicitly predicts that grammaticality judgments on marginal sentences will be especially susceptible to extra-syntactic influences.
- It accounts for the parametric variation between speakers in sentences like (18).
- It explains different levels of grammaticality in related sentences in terms of motivated and unmotivated violations of a single constraint, rather than giving two constraints and saying that violating one is inherently worse than violating the other.

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