

***do* Late Insertion: More Economical than Economy**

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Some general questions:

- How are grammatical formatives blocked when they are superfluous to a derivation?
- How does the child learn the particular contexts which use grammatical formatives without over generalizing?

The phenomenon: When grammatical formatives are superfluous, the sentence is judged to be ungrammatical. [Grammatical formatives are blocked when unnecessary:]

- (1) a. John writes books.
b. * John does write books.
- (2) a. John is too fond of Mary.
b. * John is too much fond of Mary.

[The answer posed to these questions by the Minimalist Program has relied on economy conditions (Chomsky 1991, Corver 1997). While these economy analyses often have an intuitive elegance about them, problems in their formulation and consequences of their implementation have lead some to consider alternative analyses.]

[In addition, there has been a problematic link between learnability and economy (Arnold 1995). A problem discussed later with Last Resort conditions is their inability to explain learnability facts.]

Overview:

- Briefly review Chomsky's (1991) analysis of *do*-support
- Discuss issues of learnability and economy raised by Arnold (1995)
- Review an alternative approach to *do*-support in Distributive Morphology

- Propose a modification which extends the analysis to another grammatical formative, *much*, and discuss consequences

1. An Economy Account

One important area in syntax research deals with the blocking of superfluous elements—elements whose inclusion appear to not be blocked by syntactic mechanisms and yet are judged ungrammatical without the presence of other elements. In particular, the primary data for *do*-support has this flavor. *do*-insertion is obligatory under certain conditions, but cannot be present under others.

- (3)
- John writes books.
 - * John does write books.
 - * John not writes books.
 - John does not write books.

Chomsky (1991) provides the following analysis:

- (4)
- The contrast between (1c) and (1d) follows from an ECP violation. In (1c), I lowers to V forming an improper chain (t_i , I), and then V covertly raises to I, eliminating the improper chain and forming (V, t_V). However, the presence of Neg in (1d) results in an ECP violation from covert raising of V to I.
 - The contrast between (1a) and (1b) follows from economy. Insertion of *do* in (1b) is a language-specific operation, which is argued to be more costly than use of a universal operation as in (1a).
- (5) *Economy of Universal Operations*: Prefer the use of a universal operation over a language specific operation whenever possible.

2. Noted Learnability Problems and a New Economy Proposal

Use of a Last Resort economy condition like that in (5) poses a problem for historical linguistics. As noted by Arnold (1995), last resort economy conditions should not be learnable by a speaker because all last resort operations will have an alternative, and more preferred, derivation.

Under Chomsky (1991), *do*-support should always be dispreferred during language acquisition because a more economic route is available, namely V-I raising. Consider the gloss of Middle English data in (6) which would be heard by a child during acquisition.

- (6)
- John writes books.
 - John writes not books.
 - John does not write books. [Middle English Gloss]

Given the presence of (6b) in the child's data set and the economy condition constraining language specific operations, the child should prefer V-I raising, and not acquire the structure for (6c).

[To address this problem, Arnold (1995) proposed two requirements for *do*-support: 1) *do*-insertion requires support of its own (negation, emphasis, features driving I-C movement), and 2) *do*-support avoids a more complex operation [V-I raising, followed by reconstruction of V out of the complex head].]

Under this analysis, *do*-support is first resort; it blocks a more complex operation such as reconstruction out of a complex head. This captures the contrast between (1c) and (1d) while still allowing for learnability.

- (7) a. The contrast between (1c) and (1d) follows from economy. Given the presence of Neg, *do*-support as first resort is more economic than V-I movement with reconstruction of V. Thus in (1d) V stays in-situ and *do*-insertion is supported by the presence of Neg.
- b. The contrast between (1a) and (1b) follows also from economy. (1b) should be permissible by the grammar, but is argued to be ruled out by economy of lexical insertion by the existence of (1a). In (1a), V raises to I and then reconstructs.

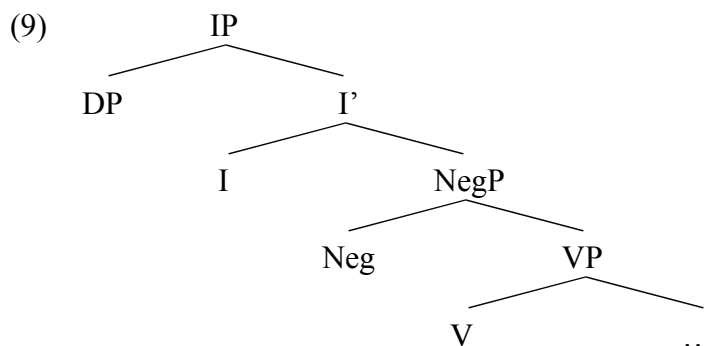
To capture (1a) and (1b), Arnold proposes the economy condition in (4).

- (8) *Economy of Lexical Insertion*: Prefer the derivation with the fewest grammatical formatives inserted at Spell-Out.

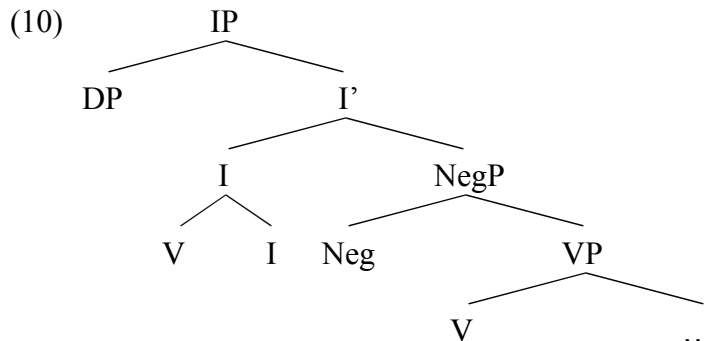
This approach maintains grammatical formative insertion as a function of narrow syntax.

3. A Distributed Morphology Alternative

An alternative approach to economy conditions for *do*-support comes from distributed morphology. Under this framework, *do*-support is handled post-narrow syntax at MS by insertion of an empty V which is realized as *do* during lexical insertion.



Halle & Marantz (1993) state that I (I = [Tns Agr]) requires V to be structurally adjacent “as a morphological property”. In exactly those cases where I is not structurally adjacent to V, a dummy V is inserted at Morphological Structure that is realized as *do* at spell-out.



The Vocabulary items for I are given in (11).

(11) [+ participle, + past]	↔	/-n/ / X + ___
[+ past]	↔	∅ / Y + ___
[+ past]	↔	/-t/ / Z + ___
[+ past]	↔	/-d/
[+ participle]	↔	/-ing/
[3sg]	↔	/-z/
[]	↔	∅

This listing allows for the correct realization of the *do* and I complex formed at Morphological Structure.

4. Late Insertion of Grammatical Formatives

Descriptively, *do*-support is required in those conditions where I is simplex at Spell-Out/Lexical Insertion.

One question with the DM treatment revolves around why a dummy V need be inserted at all. If during language acquisition, the child hypothesizes the proper forms of *do* as the Vocabulary items for simplex I, insertion of a dummy V would be unmotivated.

, the syntactic structures of those cases which involve *do*-support have a simplex I.

Suppose that the child learns a Vocabulary item for simplex I; that is, *do* is a realization of simplex I. This proposes a modification: Allow grammatical formatives to be inserted for simplex functional heads as part of the Vocabulary. [I will sidestep the issues related to the insertion of an Agr head at MS.]

The lexical entry for simplex I would be as follows:

(12) [+ past] _I	↔	<i>did</i>
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[+ participle] _I	↔	<i>doing</i>
[3sg] _I	↔	<i>does</i>
[] _I	↔	<i>do</i>

Under this view, several pieces fall out:

- No economy conditions are necessary. *do*-support is the result of a simplex I arriving at Lexical Insertion, with its own Vocabulary item. Problems with comparison of derivations involving *do* do not arise.
- *do*-support is learned as part of standard lexical learning. The (narrow) syntactic output (Agr morpheme insertion aside) is matched up with possible Vocabulary items, *do* and its various realizations being among those.
- *do*-support does not happen when I becomes complex, i.e. when I and V are structurally adjacent.

[This appears to be the case also when I is not part of the clause: John made them not work.]

Prediction: Other grammatical formatives should follow the same pattern.

5. *much*-support

Another grammatical formative discussed in the literature is *much*-support.

much-support was first discussed by Bresnan (1973), which proposed a split degree system. Some degree words functioned as having an underlying quantifier phrase. Some examples of these are given in (13).

- (13) a. as intelligent (as Bill)
 b. how intelligent
 c. that intelligent
 d. too intelligent
 e. so intelligent

Bresnan argued that the underlying quantifier *much* headed the QP of these degree words, with an obligatory deletion of *much* in the presence of these adjectives. However, when the AP was replaced by *so*-pronomalization, deletion of *much* would not occur. These two analyses are presented in (14).

- (14) a. [_{AP} [_{QP} [_{DegP} as/how/that/too/so] [_{Q'} much]]] [_{A'} intelligent]]
 b. [_{DegP} as/how/that/too/so [_{QP} *(much) [_{AP} so]]]]

Corver (1997) reanalyzed *much*-support in a minimalist framework, arguing for a strong connection between *do*-support and *much*-support. This analysis assumed A-Q raising as shown in (15). The motivation for this movement is a locality condition on θ -binding of a gradient variable in the adjective with the degree operator.

- (15) a. [DegP as/how/that/too/so [QP e [AP intelligent<G>]]]
 b. [DegP as/how/that/too/so_j [QP intelligent<G>_i [AP t_i]]]

However, in cases of *so*-pronomalization, A-Q movement is blocked. As a result, the grammatical formative *much* is inserted to provide locality between the degree operator and the gradient variable via a copy or transmutation of the θ -role. This analysis is given in (16).

- (16) a. [DegP as/how/that/too/so [QP e [AP so<G>]]]
 b. [DegP as/how/that/too/so_j [QP much<G> [AP so<G>]]]

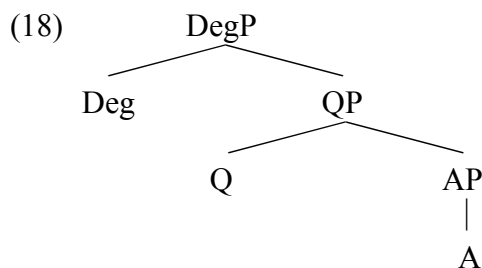
The primary data for *much*-support

- (17) a. John is fond of Mary. Maybe he is too fond of her.
 b. * John is fond of Mary. Maybe he is too much fond of her.
 c. * John is fond of Mary. Maybe he is too so.
 d. John is fond of Mary. Maybe he is too much so.

Issues of economy relate to the contrast between (17a) and (17b). Corver argues for an economy condition equivalent to Chomsky (1991) as stated in (5) to block (17b) because of the presence of (17a).

6. *much*-support as Late Insertion

Consider the case of *much*-support as one of Late Lexical Insertion. In instances where A-Q movement is blocked, Q is simplex at the point of Lexical Insertion.



If we consider *much* to be the Vocabulary item of simplex Q, we can avoid economy considerations.

Just as in the analysis of *do*-support, no dummy head need be inserted at MS. The lexical entry for simplex Q would be as follows in (19):

- (19) []_Q ⇔ *much*

Again, several pieces fall out:

- No economy conditions are necessary. *much*-support is the result of a simplex Q arriving at the point of Lexical Insertion, with its own Vocabulary item. Problems with comparison of derivations involving *much* do not arise.
- *much*-support is learned as part of standard lexical learning. The (narrow) syntactic output is matched up with possible Vocabulary items, *much* being among those.
- *much*-support does not happen when Q becomes complex, i.e. when A and Q are structurally adjacent.

7. Conclusions

Under this framework, grammatical formatives become part of standard lexical insertion.

- Simplex functional heads trigger grammatical formative insertion
- Complex functional heads do not trigger grammatical formative insertion

Grammatical formatives are predicted to be easily learned as they are part of learning the language's Vocabulary.

A strong prediction: A child will never assume that a simplex head can be null.

Further work: This account may generalize to other formatives (for instance, expletives and resumptive pronouns).