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Merge and Information Management

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Abstract
Syntactic theory has yet to achieve systematic consistency in distinguishing structure and function, especially as far as the grammar of English is concerned, before the two could be integrated in a unified model. That inconsistency has prevented progress at fundamental levels, such as an accurate description of parts of speech. A successful treatment of “stylistic reordering” is another such fundamental problem area. This paper argues that such non-canonic word orders as extraposition for focus, fronting for topicalization, middle-field topicalization, locative inversion, and passivization can be accounted for if we assume an argument structure level that is subject to information management. Reorderings at this level are then presented to syntax at the interface level of Merge, which will select lexically stored syntactic templates to accommodate the arrangement of arguments. In this arrangement is the potential for a universal base that underlies movement languages (English) and non-movement languages (Chinese) alike. Without a principled account of functions arrayed in lexical arguments prior to merge, the selection of any such templates would appear arbitrary.

Keywords: Information Management, Merge, Stylistic Reordering, Middle Field, Locative Inversion
1 - Introduction: The Need for Defining Lexical and Syntactic Functions

It is perplexing to observe to what degree grammar books and syntactic theories are still falling short of integrating structure and function. The problem appears to be that our models and notations are insufficiently set up to separate the two before they can be integrated. Form and function are so interrelated, especially in English, that they blend. To choose an obvious example, some grammar books will classify a word such as in in the construction The boss is in as an adverb. Others will say it is a preposition. Rarely will a book attempt to keep a clean distinction between syntactic function and structure and get it right: The word is a detransitized preposition heading a prepositional phrase that has adverbial function.

Since the English language relies on expressing function through structure, the two receive a blended treatment in grammar books also, which is haunting syntactic theory, where the two must be cleanly distinguished. But that distinction is more easily demanded than delivered. Chomskyan syntax, for example, makes a distinction between lexical heads and functional heads and represents them in a single tree diagram (X-bar Theory). For instance, a determiner phrase (functional) may take as its complement a noun phrase (lexical). Note now that the functional phrase is named after its function while the lexical phrase is not; it is named after a part of speech. Logically, then, we have to admit that when we write a word such as the into the terminal node of a determiner phrase, we have left unlabeled what part of speech it is, i.e. an article. It's not the same thing: “article” is a part of speech, “determiner” is a function. But it is more convenient to blur the distinction than to tackle it explicitly. Now imagine that instead of the we enter their. What part of speech would that be? Most books will classify their as a pronoun, but “pronoun” is yet a different function (noun phrase suppletion). Some books will classify the word as a “possessive determiner,” others, just to show how much confusion exists in labeling basic parts of speech, will label the word as a “possessive adjective.” To classify determiners with accuracy, one would have to classify them by (a) part of speech, (b) lexical function, and (c) syntactic function, along the lines of Table 1.

<table>
<thead>
<tr>
<th>lemma</th>
<th>part of speech</th>
<th>lexical function type(s)</th>
<th>value(s)</th>
<th>syntactic function type(s)</th>
<th>value(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>the</td>
<td>definite article</td>
<td>particularizer</td>
<td>&lt; -hypernym&gt; , 3 PL</td>
<td>determiner of reference</td>
<td>&lt; + specific&gt; , see antecedent</td>
</tr>
<tr>
<td>a</td>
<td>indef. article</td>
<td>particularizer</td>
<td>&lt; -hypernym&gt; , 3 PL</td>
<td>determiner of reference</td>
<td>&lt; + specific&gt; , see antecedent</td>
</tr>
<tr>
<td>their</td>
<td>persona l article</td>
<td>particularizer</td>
<td>&lt; -hypernym&gt; , 3 PL</td>
<td>determiner of reference, anaphor</td>
<td>&lt; + specific&gt; , see antecedent</td>
</tr>
</tbody>
</table>
Table 1 is incomplete; its purpose is to illustrate what kind of classification it would take to describe functional parts of speech adequately. In the case of their, we would say that it is a personal article (a term borrowed from German grammar) functioning as determiner. By definition, articles serve lexically to indicate that the noun will refer to a subset and not to an entire class, and all determiners have scope over the entire NP, in this case to indicate a personal association with an antecedent that binds the personal proform.

While the existence of those two levels (lexical functions and syntactic functions) is well attested, of course, we are yet to see theories, and grammar books based on them, that consistently separate and integrate those two levels in a coherent treatment. One way in which we would profit would be to have a descriptively adequate and taxonomically clean inventory of parts of speech in English.

The other benefit, I propose here, would be to have a principled account of stylistic variation.

2 - Information Management:
Argument Relations as the Functional Base of MERGE

As early as 1965, Chomsky concluded that “the rules of stylistic reordering” are “not statable in terms of the theory of transformations” (127). However, the term reordering means that syntactic principles apply first, then stylistic variation is introduced as needed. This appears to be unprincipled. I will show below that hallmark constructions of stylistic ordering in English indeed cannot be described in terms of syntactic processes, and indeed run counter to them, e.g. by violating subjacency. In addition, they involve the introduction of lexical elements (such as what, the expletives there and it, or subject-demotion marker by) that are inextricably associated with structure. To accomplish this, one would have to allow syntax to be structure building and to help itself to inserted lexical items at the highest levels of derivation—an offense against fundamental assumptions in syntactic theory.

Indications are, instead, that stylistic variations are pre-ordered, i.e. presented to syntax, and that syntax must respond to the non-canonic word orders it is dealt. The ordering of constituents (I will concentrate on arguments) may occur at a level—let us refer to it as “argument structure”—that is MERGED to syntax / Logical Form (LF). It is in the “pre-”syntactic ordering of arguments that communicative intent is expressed: Arguments are topicalized, demoted/promoted, or focused, sometimes with altruistic intent (to benefit other arguments) prior to LF, where they are then processed syntactically.

In the following passages, I shall present some typical reordering constructions in English. For each construction, I shall rule out a syntactic derivation (or point to existing literature to that effect), then show how argument structures are generated for which syntax must select a lexically stored template.

2 - 1- Passivization
Chomsky (1982: ch. 2.7) discussed a potential morphological trigger for the “passive transformation.” He speculated that the passive morpheme absorbs
Case that is ordinarily assigned to the direct object position. Specifically, he proposed that a transitive verb, which usually has the features [+V,-N], gets its Case-assigning feature [-N] stripped by the passive morpheme. The object, now without Object Case, is forced to move into the clause’s subject position to satisfy Subject Case. This account is suspect because one can find examples in which the indirect object becomes the passive subject, as in He is owed a debt of gratitude. The direct object is, in those cases, allowed to remain in place, indicating that the passive morpheme does not absorb Object Case.

Without a morphological trigger, the rationale for a movement analysis of passivization appears ad hoc. Chomsky himself recognized early on that the morphology itself is not associated with movement (104, 147n103) and ventured that the core function of passive is subject suppression (126). He did not, however, offer a syntactic rule for argument suppression.

For an argument to be suppressed without violation of the theta criterion (which exacts a syntactic position for each argument), we need to look to the level of argument structure for answers where argument status is determined. A lexical account for passivization appears intuitively correct for a number of reasons, all more or less well known:

- Passivization can indeed change meaning: Compare No member of the home team was injured (by someone) vs. !Someone injured no member of the home team.
- Passivization impacts binding: Compare The molecules were affected by each other vs. *Each other affected the molecules.
- Passivization is limited to transitive verbs, and the verb must imply volition: Compare *1500 pounds were weighed by the moose vs. The moose was weighed by the game wardens.
- A passive by-phrase may contain a suppressed subject argument preferably if it is not identical with the speaker or the listener as an agent of action ongoing in the current speech situation: Compare Is this song being downloaded by (!me / !you / a lot of people)? vs. That song was downloaded by (me / you / a lot of people).
- Passivization goes best with verbs that support a resultative reading, which may explain the perfective-aspect morphology of passive voice (Haspelmath 1990).

Passivization, then, demotes the subject argument into non-argument status (= suppression) and externalizes an object argument to take the place of the subject. Operation merge responds by selecting the appropriate template for passive from the lexicon, optionally with a prepositional phrase to accommodate the demoted subject. The prepositional phrase functions as a manner adverbial (Chomsky 1965: 103-04).
2 - 2 - Topicalization

2 - 2 - 1 - Topicalization by Clause-final Projection

Topicalization allows arguments (cf. Davidson 1982: 7) to appear before the clausal subject position (e.g. Mosquitoes I can tolerate, but beestings are bad for me). Tanya Reinhart recognized that ‘topics of new sentences should be referentially linked to expressions in previous sentences’ (1981: 76), hence should be presupposed information. Topicalization is, in other words, typically a cohesion device (Halliday & Hassan 1976). With contrastive stress, it can also establish focus at the left clause periphery.

Rochemont (1989) has shown that movement cannot be responsible for topicalization-specifically, that Chomsky’s analysis of wh-movement to COMP (1982: 115) does not apply. Instead, the topic position is populated by direct projection to adjunct position (cf. Contreras 1991: sec. 3).

Corroboration that syntactic movement does not form part of the definition of topicalization comes from its existence in a language without syntactic movement, Chinese. Positioning an argument to the left of the subject for topicalization is quite common in Chinese, as for example in sentence (1):

(1) péngyou wò jiāo-guó hěn duō
    friend I join-ASP very many
    ‘Friends, I make many.’ (Tiee 1995: 263)

If, as Chomsky once speculated, Chinese had the same Case system as English or Latin, just with a different phonetic realization (2000: 11), then the direct object would have had to move out of a Case-marked position, into a non-Case-marked one. But besides there being no evidence of either Case or syntactic movement in Chinese (Thiede 1993, 2006: 17-18), there is also no overt evidence that Chinese syntax even has a complementizer phrase CP into whose specifier position friend could potentially move at any rate.

No syntactic challenge arises if we assume that topicalization is a rearrangement of the argument structure and that Chinese (and English) syntax can accommodate such a reordering by directly projecting the topicalized phrase into an adjunct position. This would present a consistent account of topicalization in both English and Chinese. It would also explain why we find topicalizations with resumptive pronouns (e.g. These bagels, I could not bring myself to eat them), which would be impossible to generate if topicalization involved movement because a trace of movement would prevent the canonic position to be filled again.

2 - 2 - 2 - Topicalization by Projection to the Middle Field

Some languages provide a topic position in the middle field in addition to clause-initial topic. A presupposed argument in German, for example, can be projected into the middle field:
Again, for essentially the same reasons as ruling out a syntactic-movement analysis for clause-initial topic, a German "scrambling" analysis poses more problems than it solves, and a non-movement analysis is needed to analyze such a construction (Frey 2004).

Similarly, Chinese can front a direct object into middle field, either straight up or by using a BA-construction (Tiee 1995: 331, 286):

(3) a. Wŏ niàn-wán-le zhèi-ben shū.
    I read-finish-le this-CL book
    ‘I have finished reading this book.’ (canonic word order)

b. Wŏ zhèi-ben shū niàn-wán-le.
    I this-CL book read-finish-le
    ‘What I did to this book is finish it.’ ¹ (middle field topicalization)

c. Wŏ bá zhèi-benshū niàn-wán-le.
    I BA this-CL book read-finish-le
    ‘What I did to this book is finish it.’ (BA-construction)

An object raising analysis of middle field topicalization violates basic principles of grammar, especially in the BA-construction, where we would need to assume movement out of a theta-marked (and, if you believe in it, Case-marked) position and into a complement position (Thiede 2006: 11). Middle-field topicalization on the whole is best explained by direct projection. This is especially apparent for the BA-construction, which is subject to informational constraints: The fronted constituent must be presupposed, and the verb that ends up in clause-final position must be informationally salient, e.g. must have an aspect, must be compounded or doubled, or must be modified by an adverbial.

The motivation for projecting an argument into middle field is thus ALTRUISM: Doing so allows another constituent (the verb) to appear in a position closer to the right periphery and thereby gain FOCUS. This assumption, of course, is in direct contrast to syntactic triggers of movement, which are motivated by GREED (the compulsion to raise and check morphological features in a position where that is possible).

2 - 3 - Extraposition for Focus
2 - 3 - 1 - Extraposition by Projection to Clause-final Position
Focusing postpones informationally salient constituents for emphasis or contrast, e.g. He invited into his house people of all walks of life. This is often

1 - Tiee sees a subject-topicalization effect and translates: ‘As for me, I finished reading this book.’
done when the constituent is “heavy,” a term that is usually taken to mean ‘syntactically complex’ but may just as well turn out to mean ‘functionally salient.’ Culicover and Rochemont (1990) have shown that a movement analysis of focusing would result in a subjacency violation and concluded that focusing occurs instead by direct projection. Again, this constitutes theoretical evidence that stylistic reordering is not a process in overt syntax (LF)-unless we are prepared to admit ‘rules of construal’ into LF that are not subject to subjacency (so Chomsky 1982: 81, 1986: 41).

2 · 3 · 2 · Extrapolation by Passivization

An interesting special case of extrapolation for focus is passivization for focus, used to make a logical subject appear in clause-final position with emphatic stress (e.g. Tampering with the smoke detectors in the lavatories is forbidden by Federal Law). It seems natural, then, to assume that an original argument structure forbid – tampering – federal law is presented to syntax, with the intent of extrapolating the subject. However, the sequence *Forbids tampering with the smoke detectors Federal Law is ungrammatical in English because nothing is in the subject position to satisfy the Case associated with it. To avoid unassigned subject Case, MERGE instead responds by selecting the passive template to achieve the distributional objective.

2 · 3 · 3 · Extrapolation by Projection to Middle Field

We could also imagine a different choice, !There forbids tampering with the smoke detector Federal Law, but there-constructions in English are unidiomatic if the verb is transitive/active. This is, apparently, a lexical idiosyncrasy, not a syntactic constraint, a point that becomes clearer when we look at Icelandic and Dutch, where there-type sentences are indeed allowed with transitive/active verbs (Alexiadou & Anagnostopoulou 1999: 97, 103):

(4) Það hefur sennilega einhver alveg lokið verkefninu.
Someone has probably completely finished the assignment
‘Someone has probably completely finished the assignment.’ (Icelandic)

(5) Er heeft iemand een huis gebouwd.
Someone has a house built
‘Someone has build a house.” (Dutch)

The grammaticality of (4) and (5) indicates that the constraints on English there-sentences are lexical in nature, not syntactic. Alexiadou and Anagnostopoulou point out, for instance, that (5) becomes unacceptable when a proper name appears instead of the indefinite pronoun iemand. In other

2 - Note that no such restriction applies in Case-less Chinese, where we can find sentences such as Zhān-dà-le, zhēi-ge háizi (‘grow-big-PERF this-CL child’; Tiee 1995: 335).
words, there-type sentences are also generated by selection of a template from the lexicon, not by syntactic derivation.

2 - 4 - Locative Inversion

It is tempting to ask at this point whether inversions, which are commonly described syntactically as l-to-C raising and wh-raising to [SPEC,CP], could have a lexically motivated component to them. A couple of odd observations are relevant in this context. English syntax appears to be a mixed system, accommodating remnants from the time when Indo-European languages had a verb-second word order, as can be seen with current locative inversions (even though they appear to be on the demise nowadays). The following example, presented by Jung-Bok Kim (2003: 2), was culled from the British Component of the International Corpus of English (ICE-GB):

(6) In the top drawer of her desk lay her letter of resignation from Jupiter Services. (ICE-GB:W2F-008)

Kim points out characteristics of such inversions that should not surprise us at this point: The fronted prepositional phrase must qualify as a topic, and the apparently extraposed subject has focus. I agree with Kim that a syntactic derivation is unlikely, and I would like to add the following two observations to argue that it should be by direct merge to syntax:

- The construction is highly constrained and resists negation (*In the top drawer of her desk not lay / did not lie her letter of resignation).
- It has the same verbal constraint as the there-construction, i.e. no transitive/active verbs are eligible (*In the top drawer of her desk put she her letter of resignation).

Apparently, this type of inversion is not syntactically productive but an isolate from an earlier grammar of English, which is no longer a verb-second language. Along that line of argument, I would like to propose that for the purposes of this construction, English allows V-raising to I as if the verb were strongly inflected. In other words, the subject is not extraposed at all but remains in situ as the specifier of VP while the head of VP has risen above it to become the head of IP. That assumption would readily explain a couple of quirks of locative inversion:

- If we apply do-support to the head of IP, the resulting word order shows no extraposition of the subject: In the top drawer of her desk did her letter of resignation from Jupiter Services lie.

3 - Compare, in this context, Chomsky’s discussion of “active” and “inert” AGR (1992: 13 - 14, 44).
• If English negation relies on a negation phrase between IP and VP, and if the main verb is now in I, then the correct negation of (6) is In the top drawer of her desk lay not her letter of resignation, which is not exactly ungrammatical so much as unmotivated (the sentence improves if one adds something like ...but a draft of a suicide note).

• Kim’s observation that no adverbial may immediately follow the verb (as in *In the top drawer of her desk lay secretly her letter of resignation) follows directly. Adverbials are either IP-internal (here: preceding the verb, now head of IP: ...secretly lay) or VP-internal (here: following the subject, which stays in situ: ...lay her letter of resignation secretly).

For English to treat a verb (other than to be and, in some constructions, to have) as a strong verb is probably not as uncommon as one may think, because it appears that command forms also appear to involve raising the main verb into I, thus licensing a phonetically empty subject pro in the same way as pro is licensed in a strongly inflected language such as Italian [recall Andrew Radford’s famous review (1990: ch. 8) of Nina Hyams’ null subject analysis (1986) in this context]. The historical changes to English syntax have been brutal, but not complete, and as a result its lexicon is riddled with heavily constrained remnants from older systems (strong verbs and nouns, strongly inflected be, expressions such as the sooner, the better, etc.). Since strong < + AGR > is still available for the verb to be and can on some occasions be active for the verb to have, it may also be available to be turned on for overt syntactic movement if the word order requires it.

Locative inversions exhibit ALTRUISM: In English the verbal head of VP rises to I, beckoned by strong < + AGR > , to allow the subject to appear in clause-final position. What is even more intriguing is that we can find a corresponding construction also in Chinese:

(7) Shān shān shì lāohū
mountain-on be tiger
‘On the mountain is a tiger’ (Tiee 1993: 281),
corresponding to: Lāohū shì shānshān.

Again, though Chinese does not appear to have syntactic movement, argument structures are rearranged and presented to syntax, where they are matched with templates and realized structurally.

4 - It would appear that the apparent article in this template is originally an article inflected for instrumental case and used as demonstrative pronoun, more properly rendered as ‘by this [much] sooner, by this [much] better’ (Pyles & Algeo 1993: 114, 157; cf. Latham 1860: 81).

5 - If so, I-to-C raising would produce the question Lay in the top drawer of her desk her letter if resignation from Jupiter Services? Such a construction would be avoided today, but was possible some time ago. Compare walked we not in the same spirit? walked we not in the same steps? with strong < + AGR > from the King James Bible (2 Corinthians 12: 18).
## 2.5 - Permutations in Argument Structure

By way of summary, Table 2 presents an informal synopsis of how syntax responds to different permutations of arguments by merging them to syntax according to lexically stored templates. The basic idea is that basic argument structures based on thematic grids of the kind \texttt{AGENT} \textbar{} \texttt{verb} \textbar{} \texttt{THEME} are arranged to express intent in the presentation of information. The exact mechanisms (promoting, demoting, augmenting, etc.) await a formal description, but they produce structures that are visible to syntax and can be matched with idiomatic templates to project syntactic structure.

### Table 2: Illustration of Argument Relations Matched with Templates for \texttt{MERGE}

<table>
<thead>
<tr>
<th>ARGUMENT RELATIONS</th>
<th>SELECTION OF TEMPLATES</th>
</tr>
</thead>
<tbody>
<tr>
<td>people download songs \texttt{AGENT} \textbar{} \texttt{verb} \textbar{} \texttt{THEME}</td>
<td>\texttt{(THEME)SUBJ} BE-EN V (by \texttt{AGENT})ADV Songs are downloaded by people.</td>
</tr>
<tr>
<td>I tolerate mosquitoes \texttt{EXPERIENCER} \textbar{} \texttt{verb} \textbar{} \texttt{THEME}</td>
<td>\texttt{(THEME)ADJUNCT (EXPERIENCER)SUBJ} \texttt{verb} Mosquitoes I tolerate.</td>
</tr>
<tr>
<td>He invited people of all walks of life into his house. \texttt{AGENT} \textbar{} \texttt{verb} \textbar{} \texttt{THEME} \textbar{} \texttt{LOCATION}</td>
<td>\texttt{(AGENT)SUBJ} \texttt{verb (LOCATION)ADV (THEME)ADJUNCT} He invited into his house people of all walks of life.</td>
</tr>
<tr>
<td>Her letter lay in the top drawer. \texttt{THEME} \textbar{} \texttt{verb} \textbar{} \texttt{LOCATION}</td>
<td>\texttt{(LOCATION)ADJUNCT verb (THEME)SUBJ} In the top drawer lay her letter. (via V-to-I raising) OR: In the top drawer there lay her letter. (V-to-I raising plus there)</td>
</tr>
</tbody>
</table>
At times, there may be more than one choice to accommodate a particular distribution of arguments; for example, locative inversions may also be realized as there-constructions.

It is important to notice that no changes are being implied to the way syntax operates once the templates have been selected. All processes of feature checking and move apply as discussed in the current literature. Locative inversion, for example, demands overt V-to-I raising once agreement is set to strong $< + AGR >$.

3 - Conclusion

Let us assume that Merge can match idiomatic syntactic templates stored in the lexicon to argument structures that are arranged for information management. The templates would clearly belong into the periphery, not into the core grammar, and it is significant to point out that templates, including “long passives” (with by-phrases), are acquired comparatively late, during the school years.

If lexically stored syntactic templates belong into the periphery of grammar, then no core grammar mechanisms should be affected. Attempts of linguists to derive them syntactically therefore amount to overreaching. Core syntactic theory is not meant to account for idiomatic aspects of information management. We should therefore concentrate on how argument structures merge to core syntactic mechanisms such as we know them.

However, what does belong into an account of core principles of syntax is an account of information management. A comparison between English and Chinese shows that the same distributions can be achieved in each language. Since the two languages differ in their morphology of Case and inflection, eliminating move for Chinese, they must rely on fundamentally identical mechanisms to achieve those syntactic distributions. Those mechanisms, I propose, will ultimately need to find a unified description in terms of informational functions, and they are likely candidates for a Universal Base to syntax.

A comprehensive description of what happens at the level of argument arrays should not affect syntax per se, except for freeing it from the responsibility of deriving idiosyncratic, language-specific templates. Thus, such a lexical-functional grammar should be conceived as an extension of current syntactic theory. However, it may turn out that some mechanisms that can be described in terms of syntax ultimately belong into the realm of argument arrays. I am thinking of Case assignment, for example. If a topicalized object can carry structurally assigned object Case (e.g. Him, I don’t like t), and if resumptive pronouns can carry the same Case as their antecedent (e.g. My mother, she does not like him at all), then it would appear that the assignment of Case to positions is triggered at the argument-structure. In other words, the old distinction of “inherent” vs. “structural” Case may need to be unified.

I am of course aware of the unpleasant memory of a stage in linguistic debate that Frederick Newmeyer later referred to as the “Linguistic Wars” over generative semantics vs. generative syntax (1986: ch. 5), but the implication of
my proposal is not that generative syntax has it wrong. Instead, I believe it is entirely within the thrust of the Minimalist Program to keep core syntax economically enough to explain learnability yet adaptable enough to accommodate idiomatic structures.

References


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