The copy theory of movement and the binding-theoretic status of A-traces: You can't get there from here

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Abstract

Minimalism, in contrast to Government-Binding Theory, does not analyze traces as being categories that are devoid of content at the moment of creation; rather, movement is viewed as being decomposed into copying plus deletion. Applying this to A-movements leads to binding-theoretic problems. The answer that I propose is that traces are deleted before the binding theory applies; in this way, the behavior of A-traces with respect to a number of reconstruction phenomena is shown to follow—traces are simply not there. Also, a principled explanation is given for Lasnik's conjecture that A-traces don't exist, and his conjecture is strengthened.

1 Introduction

Since the early 1970's, within what can broadly be called Chomskyan syntax, it has become commonplace to posit a trace in the original position every time an element moves. The trace was originally most commonly viewed as an empty category, co-indexed with the element that moves, as in (1):

(1) a. I wonder who$_i$ John saw t$_i$.

b. John$_i$ was arrested t$_i$.

The moved element is said to bind its trace, with binding defined as in (2):

(2) Binding $=_{\text{def.}}$ A *binds* B if and only if A c-commands B and A and B are co-indexed.

Particularly within the Government-Binding Theory (Chomsky 1981, 1982), the status of the referential content of these traces was a topic of some interest. The Binding Theory is assumed to partition referential nominals into three classes: anaphors, pronominals, and R-expressions; this third class is presumed to constitute the referentially independent expressions. Assuming that binding is restricted to argument positions (called A-positions), the Binding Theory is given in (3):

(3) Binding Theory

Principle A: An anaphor must be A-bound in its local domain.

Principle B: A pronoun must be A-free (i.e., not bound) in its local domain.

Principle C: An R-expression must be A-free.

The trace of wh-movement is called an A-bar bound trace, in that the moved element is in what is called an A-bar (i.e. a non-argument) position, and hence the wh-trace was taken to be an R-expression, since its binder is not in an A-position.[1]

[1] I will henceforth ignore the issues surrounding the binding theoretic status of A-bar traces.

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My concern will be for a problem for the binding-theoretic/copy-theoretic account of A-traces, as in (4):

(4) John$_i$ was murdered t$_i$.

If the trace of *John* is literally taken to be a copy for the purposes of the binding theory, the trace will cause a violation of Principle C. After all, the moved element, its binder, is in an A-position, causing the moved element to A-bind the trace.

For this reason, the A-trace has been taken to be an anaphor, from the beginning of Government-Binding Theory (Chomsky 1981) to the present day. From one perspective, this seems reasonable. If the A-trace is anything, it must be an anaphor, in order to escape the clutches of the Binding Theory. Nevertheless, I will argue, from a variety of considerations, that there is no workable way to achieve the anaphoric status of the A-trace, and that will be the bulk of this paper. Because the A-trace could not be an anaphor, it cannot be anything, and so this paper will show that what Lasnik (1999) contemplated as a possibility, i.e. that null A-traces do not exist, is a reality, and provides a principled reason why that is the case.

The proposal to do away with A-traces, however, immediately faces objections about "reconstruction" of the moved element in the position of the trace (Bobaljik 2002, Boeckx 2001, Hornstein 1995, and others). I take the tack that there is less to these objections than meets the eye. Reconstruction seems to be used simultaneously as the name of a phenomenon and the theoretical account of that phenomenon. Reconstruction as the name of a phenomenon simply means interpreting a displaced element as though it were in its original position. As Lasnik notes, in the above paper, one could equally well treat the account in derivational terms, doing interpretation before movement, as in terms of traces.

The paper will develop as follows. In Section 2, I will discuss apparent cases of R-expressions converting to pronouns, and develop an account of such conversions in terms of a theory of pronouns that is advocated in Baltin & Van Craenenbroeck (in preparation). Section 3 shows that the account of conversion to a pronoun that is advocated there will not allow for conversion to an anaphor, a consequence that is supported by facts about object ellipsis in Korean. One of the areas that I will apply the Baltin-Van Craenenbroeck approach to is the phenomenon of copy-raising (Ura 1994, Moore 1998), and in Section 4, I will show that previous arguments for A-traces fail to establish their existence. Section 5 shows that A-traces must appear originally but must delete by the time that the Binding Theory applies, and discusses Lasnik's analysis and conclusion. Section 6 discusses semantic accounts of copy-conversion to a trace, and Section 7 concludes.

2 Pronoun-Conversion

In this section, I will document acceptable cases of changing the referential status of a nominal, in order to contrast these cases later with impermissible changes. Specifically, it is possible to change an R-expression, or a referentially independent expression, to a pronoun, and I will now propose why this is possible, but not extendible to a change to a reflexive.

2.1 A. Cases of Pronoun-Conversion

Chomsky (1995) proposes a constraint on the inclusion of new syntactic material in the course of a derivation, such as indices or bar levels. Phrase-markers are argued to be entirely constituted of features, which are arranged into bundles, and these bundles (i.e. lexical items) merge with other bundles to create phrases, which are then calculated to bear the label of one of the daughters. No other elements can appear in phrase-markers, other than what is present at the outset. This constraint, called 'inclusiveness', essentially makes phrase-markers extremely sparse, and rules out feature-changing on nodes in the course of derivations.

One such operation proves particularly challenging for Inclusiveness—the operation dubbed 'Vehicle Change' by Vanden Wyngaerd & Zwart (1990). This operation has been thought to convert an R-expression to a pronoun in an ellipsis context, so as to avoid a Condition C violation. Vehicle change is at work in the following situation, assuming that the binding theory applies to the resolved ellipsis case:

(5) We thought that John$_i$ would be arrested, but he$_i$ didn't _____ (i.e. think that he$_i$ would be arrested).

If vehicle change converts *John* to a pronoun in the elided VP, the structure does not violate the binding theory, since a name c-commands a pronoun in a distinct local domain after the conversion.

A case that is similar, from a certain point of view, is the process known in many languages as copy-raising—see Joseph (1976) for a discussion of this case in Classical Greek, Ura (1994) for Igbo, and Moore (1998) for Turkish. English has it as well (dubbed Richard by Rogers 1974), and it can be seen at work in (6):

(6) a. The shit$_i$ looks like it$_i$'s gonna hit the fan.
b. There$_i$ looks like there$_i$'s gonna be a riot.

(6a) shows an idiom chunk in the matrix subject position; of interest is the realization of the original, in the embedded subject position, as a pronoun, rather than an overt copy. (6b), in which an expletive is realized in both the matrix and the embedded subject position, is also significant.

These facts can be explained by the Binding Theory, in which we note that leaving the originals as literal copies in (6a) would violate the binding theory, so that (7), for example, would violate Principle C:

(7) * The shit$_i$ looks like the shit$_i$'s gonna hit the fan.

Binding is standardly defined as in (8):

(8) α binds β $=_{\text{def.}}$ α c-commands β and α and β are co-indexed.

I will assume the standard definition of c-command, in which α c-commands β iff α does not dominate β and the first node that dominates α dominates β as well. Interestingly, attributing

the form of the original in copy-raising to the demands of the binding theory receives cross-linguistic support. Lasnik (1991) shows that Thai, Vietnamese, and Korean, while differing in certain respects among themselves, all apparently lack Condition C. The examples below, drawn from Lasnik's paper, are from Thai and Vietnamese, respectively:

(9) Cɔɔn khít wa͡a Cɔɔn chàla͡at.
John thinks that John is smart
'John thinks that he is smart.' Thai (Lasnik 1991:12, ex. 20)

(10) John tin John sẽ thǎńg.
John thinks John will win.
'John thinks that he will win.' Vietnamese (Lasnik 1991:12, ex. 21)

To these languages could be added Laotian, and the Laotian copy-raising construction allows the original to remain as an overt copy (i.e. not a pronoun):[2]

(11) John khuu waa John bɔɔ mii panjaa.
John appears that John NEG have knowledge
'John is an idiot.' Laotian (Vincent Chanethom p.c.)

If the original must convert to a pronoun in English in order to obey the binding theory, languages that have different binding requirements would be expected to show different forms for the original, and Laotian illustrates that this expectation is fulfilled.

My concern is the second part of the definition of binding, which requires co-indexing. In line with much recent minimalist work on the grammatical nature of indices (Reuland 2001, Kratzer 2009), I will take identity of indices to depend on identity of φ-features (i.e. person, number, and gender features), and, following Chomsky (1995), take the expletive *there* to be defective, containing at most a person feature. The realization of the forms, then, seem to be dictated by the binding theory.

3 The Absence of Reflexive-Conversion Processes

However, why does copy-raising seem to be so limited in the realizations of the originals, restricting the forms to pronouns and expletives? There seem to be no instances of copy-raising in which the original appears as a reflexive, as can be seen in Ura's survey of the languages in which this phenomenon appears, or the virtual absence of originals being realized as reflexives in the published literature.

Moreover, absence of conversion to reflexives is, I would claim, the same phenomenon as the absence of reflexive interpretations for null objects, noted by Kim (1999),[3] in his dis-

[2]Thanks to Vincent Chanethom for this judgement.

[3]An anonymous reviewer suggests that null objects in these languages might simply be null topics, as originally proposed by Huang (1987), in which case the lack of a reflexive reading might simply be due to the inability of reflexives to serve as topics. First, I would dispute an absolute prohibition against reflexives serving as topics; (i) sounds fine to me.

cussion of argument ellipsis in Japanese, Korean, and Mandarin, unless the elided argument is anteceded by another reflexive, as in (12):[4]

(12) Zhangsan bu xihuan [guanyü ziji-de yaoyan]; Mali ye bu xihuan [NP e].
Zhangsan not like [about self-Gen rumor] Mary also not like [NP e]
'Zhangsan doesn't like rumors about himself, and Mary doesn't, either.'
a. Mary does not like rumors about herself, either.
b. Mary does not like rumors about Zhangsan, either.
Mandarin (Kim 1999:255, ex. 2)

Crucially, Kim shows that elided objects cannot be interpreted as reflexives (citing Huang 1987 for the generalization):

(13) a. Zhangsan da le [NP e]
Zhangsan hit PERF [NP e]
i. * 'Zhangsan hit himself.'
ii. 'Zhangsan hit someone else.' Mandarin (Kim 1999, ex. 45)

b. Peter-nun/ka [NP e] cungoha-yess-ta.
Peter-TOP/NOM [NP e] hate-PAST-IND
i. * Peter hated himself.
ii. Peter hated someone else. Korean (Kim 1999:275)

Kim proposes to account for this generalization by employing Fiengo & May's (1994) more articulated theory of index types, with α-occurrences of indices representing nominals with independent reference, and β-occurrences of indices representing nominals with dependent reference. The inability of elided objects to be interpreted as reflexives is due, in his system, to the reflexive bearing a β-occurrence of the index, while the antecedent subject bears an α-occurrence, as in (14):

(14) [Peter nun/ka]$_{\alpha_1}$ [NP e]$_{\beta_1}$ cungoha-yess-ta.

In Fiengo & May's system, syntactic identity is required for ellipsis (or copying), and the different types of indices destroy this identity.

Below, I will posit a different account of the inability of reflexives to elide when they are solely locally A-bound,[5] one which does not rely on the distinction between α-occurrences

(i) Himself$_i$, John$_i$ really likes.

Second, Otani & Whitman (1991) argue against Huang's analysis, noting certain cases of sloppy identity that Huang's analysis predicts to be possible but which cannot occur. I therefore retain the conclusions in the text.

[4]Kim shows that such examples are true object-ellipsis cases, and not cases of VP-ellipsis preceded by raising of the V out of the VP, as proposed by Otani & Whitman (1991).

[5]That is, when they are not parallel to other sentences in which the object is locally A-bound by the subject, as in (i) (Kim's ex. 48, noted by Xu 1986).

(i) Meigeren piping le ziji ma? Bu, John mei piping le [NP e].
everyone criticize PERF self Q no John not criticize PERF [NP e]
'Did everyone criticize themself? No, John did not criticize himself.'

of indices and β-occurrences of indices. In short, we have found cases where R-expressions convert to pronouns, but no cases where names convert to anaphors. The trick is to account for this gap in a principled way. I will show why null objects must lack interpretations as anaphors.

Baltin & Van Craenenbroeck (in preparation) account for pronoun-conversion by viewing pronouns as being configurationally defined rather than defined by a feature [+pronominal]. Viewing deletion as occurring in the syntax, as proposed by Baltin (to appear), a pro-form is defined as in (15):

(15) A pro-form is a functional head with a missing complement.

By "missing", I mean "radically missing" (i.e. not present in the syntax itself). This accounts for ellipsis-containing antecedents, as in (16):

(16) John cleaned because he had to ____, and he cooked because he did _____ as well.

The VP-ellipsis in the subordinate clause of (16)'s second conjunct can, under one interpretation, be construed as "had to cook", i.e. is a sort of "mixed reconstruction" of the first ellipsis minus the antecedent of the first elided VP, and the substitution of the antecedent of the second ellipsis for the antecedent of the first ellipsis. In other words, the actual content of the first ellipsis cannot be computed if the first ellipsis is an antecedent for the second ellipsis. This could be explained if the ellipsis resolution restores a kind of "pro-form", parallel to the phenomenon of sloppy identity in (17), which requires a looser form of identity than strict syntactic and semantic identity between antecedent and elided material:

(17) John$_i$ flipped his$_i$ lid, and Sally$_j$ did _____ too. (i.e. flipped her$_j$ lid).

By taking seriously Postal's (1969) original view of pronouns as determiners whose (in the current sense) NP complements have been deleted, if we take deletion to render material radically missing, we can see that pronouns are, in a sense, under-specified forms of their antecedents. In a sense, then, conversion to a pronoun does not add information but rather, if anything, removes information. In this sense, inclusiveness is not violated by pronoun-conversion, and therefore pronoun conversion is permitted.

Crucially, I am taking conversion to a pronoun to be optional, in the sense that the ellipsis (in this case, of the relevant NP, but of any elided category) is optional- a fact that unites Laotian copy-raising, in which the ellipsis does not happen because it is not forced, with English copy-raising, in which it is forced. Such a conversion to anaphors would be impossible, because anaphors do not involve deletion. A fairly stable characterization of anaphors, since Pica (1987), views them as morphemically complex. Pica observes, in what has come to be known as 'Pica's Generalization', that morphologically complex anaphors can be locally bound, while morphologically simplex anaphors cannot be, but rather must be

long-distance bound.[6] An example of this contrast can be found in Dutch, with the contrast between simplex *zich* and complex *zichzelf*, from Reinhart & Reuland (1993):

(18) Jan zag [jou achter zich/hem staan].
Jan saw [you behind SE/him stand]
'Jan saw you stand behind SE/him.' (Reinhart & Reuland 1993, ex. 9)

(19) Jan haat zichzelf/*hem.
Jan hates himself/*him.
'John hates himself.' (Reinhart & Reuland 1993, ex. 10)

Reinhart & Reuland encode this contrast by distinguishing two types of anaphors: SE-anaphors (essentially morphologically simplex) and SELF-anaphors (morphologically complex), and formulating their binding principles that refer to anaphors in terms of SELF-anaphors.

This regular correspondence between morphological form and binding-theoretic behavior suggests an extension of the Baltin & Van Craenenbroeck approach to anaphors. In other words, having a characteristic morphological form simply is the signature of being classified as an anaphor; no separate feature [+anaphor] is needed, and indeed should be discarded as unrevealing. However, there is no operation that could convert an R-expression into an anaphor without violating inclusiveness. No deletion is involved in the genesis of anaphors; they are typically just genitives+nouns. (Recall Helke's (1971) analysis of reflexives in English, in which he motivated this structure for English.) Therefore, if we accept inclusiveness, we must reject conversion to an anaphor.

We are now in a position to draw a different conclusion from Kim's about the impossibility of taking dropped objects to be anaphors in Korean when they are bound solely by their subjects, as in (14). Let us take deletion to apply in the syntax, as argued in Baltin (to appear). (Note that this conclusion is forced if we accept the Baltin-van Craenenbroeck analysis of pronoun conversion.) Because the binding theory applies at LF, deletion will feed the binding theory. If deletion requires syntactic identity, there will be no option for interpreting a deleted object as a reflexive; inclusiveness prevents conversion to a reflexive, the binding theory will rule out conversion to a pronoun as a Condition B violation, and if the object remains as an R-expression, Condition C will rule out the structure.

However, deletion of A-traces will be permitted, and, in most cases, forced by the binding theory.[7] Because there is no licit binding-theoretic type for an A-trace in many cases,

[6] Unless the SE-anaphor is the third argument of a triadic predicate which is already reflexive-marked, as in the Dutch equivalent of (i):

(i) John assigned himself to himself.

See Reinhart & Reuland (1993) for details.

[7] One exception seems to be A-moved anaphors as ECM subjects, as in (i):

(i) John$_i$ believes himself$_i$ to be admired t$_i$.

The trace in this case, as a pure copy, will be a copy of a reflexive, and hence could remain in the representation. This will not be true, I claim, of A-traces of pronouns and R-expressions.

such a dependency cannot register at the point of application of the binding theory. Thus, the deletion is a familiar case of "repair", of the sort noted originally by Ross (1969), in his analysis of sluicing as repairing island violations, and, more recently, by Merchant (2001) and Fox & Lasnik (2003). More recently, these latter authors have explicitly taken PF to be the locus of application of ellipsis and so ellipsis will "amnesty" violations that would otherwise have been incurred at PF. Merchant illustrates the concept of PF-Islands with Left Branch Condition violations, originally studied by Ross (1967).[8]

(20) * How detailed does he want [____a list]? (Merchant 2001:Ch. 5, ex. 6a)

These violations can be repaired by deleting the phrases in which the offending extractees originate:

(21) He wants a detailed list, but I don't know how detailed.
(Merchant 2001:Ch. 5, ex. 16a)

However, the binding theory is standardly assumed to apply at LF, affecting semantic interpretation rather than phonetic interpretation. Therefore, deletion at PF should not amnesty a binding-theoretic violation. On the other hand, if deletion applies in the syntax, deleting formal features, deletion will bleed the binding theory, which interprets or feeds the interpretation of formal objects.

3.1 How and where does deletion work?

Like others who have considered the mechanism of trace-deletion (e.g. Chomsky & Lasnik 1995), I assume that trace-deletion is just deletion, i.e. whatever mechanism is responsible for ellipsis will delete traces, whether they are specifically traces (as in Fox 1999) or copies. In this vein, trace-deletion (I am specifically concentrating on A-traces) is formally no different from any other instance of deletion. Viewed from this lens, we are led to ask why object-deletion can apply in some languages, such as Chinese, Japanese, and Korean, but not others, such as English, while A-traces are not similarly constrained, so that, e.g. English, has object A-traces.

A common view of the difference is that the languages which can drop the object typically lack agreement between the nominal and functional heads in the neighborhood (see Kuroda 1988 for an advocacy and defense of this view). If we view agreement features as being checked at PF, and take "deletion at PF" to mean non-pronounciation of phonological features plus literal erasure of "strong" features (features playing a role in overt pronounciation), we can see that deleting a nominal with valued agreement features will deprive a head that has unvalued agreement features of a source of valuation. For example, consider a hypothetical case of object-drop in English:

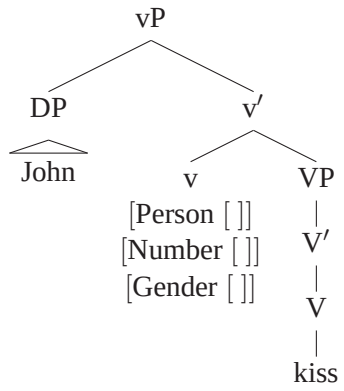
(22) a. John kissed Sally.

[8] An anonymous NYUWPL reviewer questions this judgement, and finds (21) acceptable. I am reporting Merchant's judgement, however, and I and other native speakers find it unacceptable.

b. * John kissed _____.

The structure for (22b), in which the object has dropped, will be (23) in the relevant respects:

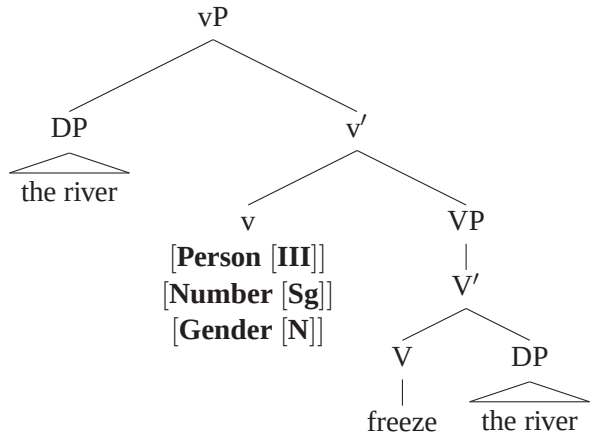
(23)



The Person, Number, and Gender features are unvalued, normally being valued by the object, which in this case has dropped; in the meantime, v no longer has any way of valuing its φ-features. If we assume that agreement is checked at PF, deletion at PF will account for deletion's bleeding agreement.

On the other hand, movement of the object, taken to be internal merge, will not bleed agreement. Let us assume, for instance, that the object merges first in [Spec,vP] when it moves, for instance as an unaccusative:

(24)



Deletion is indicated by bolding, and in this case, if we assume that merge into v's Spec can value v's uninterpretable features, this merge will satisfy v's requirements. In languages that freely allow object drop, such as Japanese, Chinese, and Korean, v presumably lacks uninterpretable φ-features. In short, deletion of traces, in whatever form, can be shown to be governed by the same principles as deletion of any type of phrase.

4 Arguments for A-traces (including A-traces as anaphors)

As Lila Gleitman (1995:185) said, "Difficult problems can be solved. Impossible ones are harder." Nevertheless, I haven't, strictly speaking, shown that taking A-traces to be anaphors is impossible; after all, my objection rests upon the Inclusiveness Condition, which, while plausible, is still an empirical constraint. Therefore, it would be helpful to consider arguments both for A-traces that have appeared in the literature, and independent arguments for A-traces being anaphors.

To preview my conclusions, it is obvious that they will be, while reasoned, unequivocally opposed to those drawn by the linguists who originally put forth these arguments. For one thing, many of the arguments are based on reconstruction, which is, in my view, ambiguous between the name of a phenomenon (interpreting an element in Position A as though it were in Position B, a position lower than A in the phrase-marker) and the account of that phenomenon (literally putting the element back into Position B for the purposes of interpretation). Chomsky (1995:202) seems to take the latter approach to reconstruction when he writes:

> Reconstruction is a curious operation, particularly when it is held to follow LF-movement, thus restoring what has been covertly moved [...] If possible, the process should be eliminated. An approach that has occasionally been suggested is the "copy theory" of movement: the trace left behind is a copy of the moved element, deleted by principle of the PF component in the case of overt movement. But at LF the copy remains, providing the materials for "reconstruction." Let us consider this possibility, surely to be preferred if it is possible. (Chomsky 1995:202)

What is noteworthy is the reference to reconstruction as an operation. Clearly, he is viewing reconstruction as a theoretical account, rather than as a phenomenon. As a theoretical account, however, it is equating the phenomenon with a specific mechanism for accounting for it—i.e., the copy theory of movement. Other accounts are possible, however, such as a sequential derivation in which the element in question is actually interpreted in its original position. In fact, a derivational account will be shown to be supported in the next section when copy-raising is discussed in some cases. In others, such as Huang's (1993) arguments for A-traces, a derivational account will not be possible, and other considerations will be brought to bear, such as Heycock's (1995) reformulation of the facts.

4.1 A. 'Specified Subject Condition' arguments

These arguments all rely on some version of Chomsky's (1973) Specified Subject Condition, formulated as in (25):

(25) No rule can involve X, Y (X superior to Y) in the structure $\ldots X \ldots [\alpha \ldots Z \ldots$ - $WYV \ldots] \ldots$ where Z is the subject of WYV and is not controlled by a category containing X.

The leading idea is that if Z is present as a trace that is bound by X (i.e. is "controlled" by X in the formulation above), it can act as a specified subject that blocks the relation between any two positions between which it intervenes (i.e. Y and a position other than X).

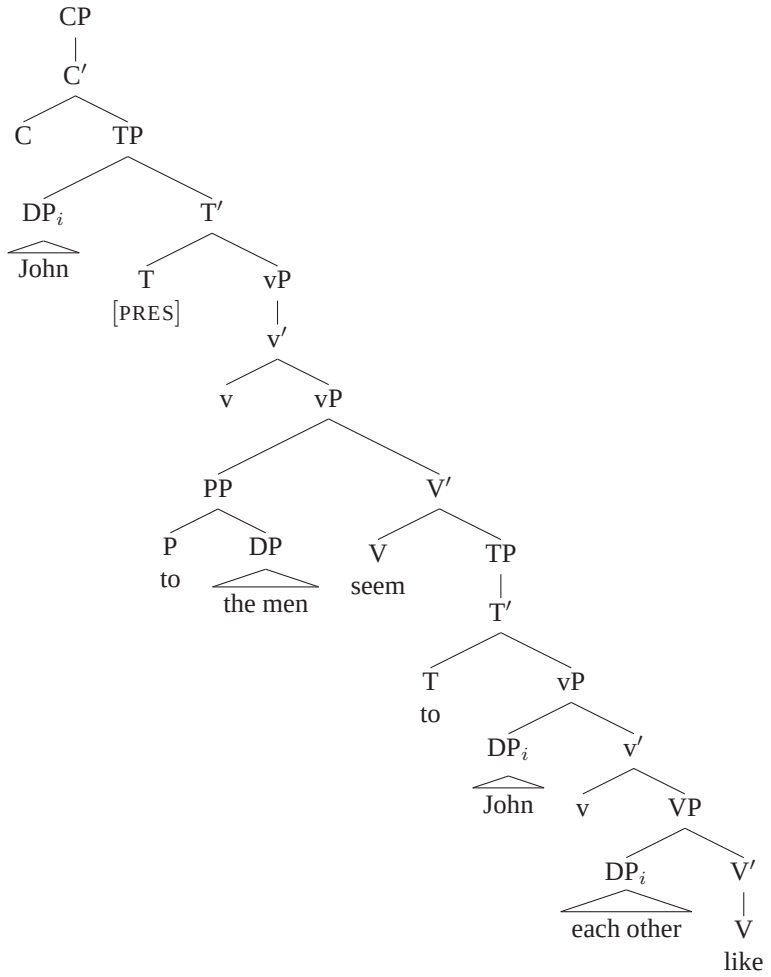
4.1.1 An early argument for A-traces

Chomsky (1973) notes the ungrammaticality of (26):

(26) * John seems to the men to like each other. (Chomsky 1973, ex. 173b)

The inability of binding to occur across a raised subject, when the binder is not the raised subject itself, can be accounted for by assuming (i) that the preposition to does not block c-command by its object of sisters to the *to*-phrase; (ii) the raised subject leaves a trace, which acts as a specified subject that intervenes between the putative binder (i.e. *the men*, in this instance) and the anaphor. In current terms, the trace of the subject causes the embedded vP to constitute a local domain, with Principle A requiring that an anaphor be bound in its local domain. (27) is the structure of (26) in the relevant respects, showing the problem:

(27)



In this case, the embedded vP constitutes a local domain for the anaphor each other, which is free within it, violating the binding theory. The trace of the raised subject, then, counts as a suitable proxy for the raised subject itself, creating a local domain for binding.

Chomsky considers an alternative account of the ungrammaticality of (26) which does not rely on traces, but rather on ordering anaphoric binding with raising. This straightforward derivational account simply orders binding before raising, at which point the embedded subject is overtly present. A problem for this alternative, according to Chomsky, is that it creates an ordering paradox, in that raising can feed binding, as seen from the contrast between (28a-b):

(28) a. They$_i$ seem to each other$_i$ to be happy.
b. * It seems to each other$_i$ that they$_i$ are happy.

(28b) is ungrammatical because the antecedent does not c-command the anaphor with which it is co-indexed; raising the antecedent in (28a) allows this antecedent to c-command the anaphor, binding it and hence satisfying the binding theory. The ordering paradox is a problem in a theory in which all semantic interpretation rules follow all syntactic transformations (binding is considered to be a rule of semantic interpretation), and semantic interpretation operates on a completed phrase-marker.

This argument lacks the force that it once had; currently, a significant, probably the dominant, strand within minimalism takes syntactic, semantic, and phonological computation to take place in a bottom-up fashion that is based on units of said computation called phases (Chomsky 2000,2001). Let us take the phases, for the sake of concreteness, to be vP and CP, as does Chomsky. In this case, the lowest vP, when constructed, will have a subject, and because the anaphor is within this phase, it will be evaluated for binding and, in the case of (26), will be free, causing a Principle A violation. In the case of (28), the anaphor is in the higher vP, and when the vP gets its subject through raising, the anaphor will be bound, satisfying the binding theory.

In short, if binding is dynamic, applying to each phase as it is constructed from the bottom up, the "ordering paradox" disappears. Binding occurs at various points in the grammar, and so is interspersed with syntactic computation, which will also occur at various points. The argument for traces, then, no longer is as strong as it was in 1973, because the core assumptions have changed, and the derivational alternative is more plausible now than it was at that time.

4.1.2 The ban on super-raising as a binding theory violation

Super-raising (Rizzi 1990, Ura 1994, and others) can be defined as long A-movement over an overt subject. An example would be (29):

(29) * John$_i$ seems that it is likely t$_i$ to win.

An initially appealing account of the ban on super-raising would ascribe super-raising's impossibility to the binding theory, and taking the trace to be an anaphor. The intervening

lexical subject, the expletive it in this case, would cause the intermediate clause to be a local domain, within which the trace would be free.

A problem for the assimilation of this case to the binding theory is that super-raising is much worse than overt binding in this configuration, as in (30):

(30) * They$_i$ think that it would be necessary for each other$_i$ to leave.

The contrast between (29) and (30) argues against an assimilation of the ban on super-raising to an account based on a Principle A violation. Indeed, Rizzi (1990) bans super-raising as a violation of Relativized Minimality, in which an argument cannot move over the nearest c-commanding A-specifier, a condition violated in (30). Presumably, the class of possible interveners differs for the purposes of the Binding Theory.

4.1.3 Reconstruction and the need for an A-trace

One interesting argument for an A-trace is based on reconstruction, and does not have a straightforward translation into a derivational account. This account, due to Huang (1993), is based on the different reconstruction possibilities of A-bar moved predicates and A-bar moved arguments, and can be seen in the contrast in (32):

(31) a. * How angry with each other$_i$ do they$_i$ think that he$_j$ is _____?
b. Which pictures of each other$_i$ do they$_i$ think that he$_j$ saw _____?

Huang's account relies on the predicate containing a trace in subject position of the predicate that is co-indexed with the subject of the embedded sentence, as in (31b).

Interestingly, the grammaticality of (31b) argues for a derivational account of binding over the reconstruction account, if we assume that the binding takes place when the wh-phrase is in the Spec of the lower CP, in which case it can be bound by the matrix subject, which c-commands it. If we assume that intermediate traces delete at LF, so that we would only have, in the case of a wh-phrase, an operator that binds a variable in an A-position, the intermediate position in which binding would occur could not be represented by a trace at LF.

(32) [t$_j$ how angry with each other$_i$] do they$_i$ think that he$_j$ is ____?

The fronted predicate, because it contains the subject trace, would constitute a binding domain; therefore, the anaphor within the predicate would have to be bound within the predicate. If the anaphor were bound outside of the predicate, e.g. by the matrix subject, the binding would violate Principle A.

The wh-argument in (31b), on the other hand, would lack a subject trace, and hence would not constitute a local domain for binding. Hence, reconstruction of a wh-argument is not forced. Heycock (1995) argues, however, that the assumption of a predicate-internal trace, crucial to Huang's account, is insufficient to account for all cases of obligatory reconstruction of predicates. For instance, a predicate-internal A-trace will do nothing to amnesty the apparent Condition C violation in (33):

(33) ?* [How afraid of Margaret$_i$]$_j$ do you think she$_i$ expects John to be t$_j$?
(Heycock 1995, ex. 13)

In (33), *John* is the subject of the predicate, but obligatory reconstruction of the predicate will force the matrix subject, after reconstruction, to bind the R-expression *Margaret* in the predicate, violating Condition C.

Heycock's solution to the predicate-argument reconstruction asymmetry is to appeal to the D-linked/non-D-linked distinction between A-bar dependencies developed by Pesetsky (1987), Cinque (1990), and others. Essentially, if predicates are typically non-D-linked, a way of representing the distinction, in Heycock's system, is to lower the restriction into the position of the trace.[9] Heycock's account ensures, then, that the A-trace account receives no support from predicate/argument asymmetries.

4.2 Scope reconstruction

May (1977) noted that (34) has a reading in which the matrix subject scopes below the matrix predicate:

(34) Somebody is likely to leave.

One way of interpreting this fact is to allow the matrix subject to lower to the position of the trace, as in (35):

(35) e is likely [somebody] to leave.

Boeckx (2001) discusses this phenomenon in detail, and notes that literal lowering would violate the proper binding condition (Fiengo (1977)), in which traces must be c-commanded by their antecedents. After all, the pre-lowering representation of (35) is (36):

(36) [Somebody]$_i$ is likely [t$_i$] to leave.

And the trace in (36) in the embedded complement is replaced by the matrix subject, with which it is co-indexed, and which was originally in the position of the trace. The lowering of the subject back into its original position, however, will leave a trace, which must itself be bound. Boeckx solves this problem by inserting a null expletive in the position of the matrix trace, eliminating it.

An alternative, within what has come to be known as 'Single-Output Syntax' (Bobaljik 1995), views movement as copying to a c-commanding position, and it is a matter of phonology as to which copy to pronounce (i.e., the higher copy or the lower copy). Bobaljik (2002) argues that one can distinguish which copy is activated for interpretation and which is activated for pronounciation, so that, e.g., lowering can be seen as activation of the lower copy

[9] In a copy theory of traces, this seems tantamount to deleting the operator part of the phrase, leaving the restriction in the trace position. In any event, I am taking no stance on the existence of A-bar traces, and so nothing in Heycock's account is incompatible with mine, which is concerned solely with the existence of A-traces.

for interpretation and activation of the higher copy for pronounciation. Boeckx provides an interesting argument against the copy view of lowering, noting the contrast in (37)-(38):

(37) A red car seems to me to be parked at the corner.
(=it seems to me that there is a red car. . .) (Boeckx 2001, ex. 67)

(38) A red car seems to every driver to be parked at the corner.
(*it seems to every driver that there is a red car. . .) (Boeckx 2001, ex. 68)

In other words, scope reconstruction is blocked across an intervening quantifier experiencer. The copy theory, which makes the matter solely a decision as to which copy to pronounce, has no explanation for why an intervening quantifier should affect the decision, but Boeckx argues that a Relativized Minimality (Rizzi 1990) account is available under a lowering analysis, given that the intervening quantifier will block reconstruction of a quantifier, assuming that lowering and raising are both subject to Relativized Minimality.

By providing an argument against the copy theory, Boeckx is potentially on the same side as this paper. However, we must ask whether (a) his positive proposal is compatible with the non-existence of A-traces; and (b) whether an alternative proposal for scope reconstruction that is compatible with the facts is in accord with the non-existence of A-traces.

As for the first question, it is important to note that, in a Bare Phrase Structure framework, nothing rules out creation of a specifier position. For standard cases of raising, Chomsky (1995) notes that the position is actually created by raising, i.e. there is no movement into an empty node, as there was in the 1970's (see e.g. Emonds 1976). Just as this is true for raising, so could it be true for lowering.[10] However, at least one possibility for the representation of the scope ambiguity in (34) exists which, it seems to me, is compatible with the phenomena that Boeckx notes, but which does not require lowering.

Willliams (1983) discusses verbs that take pleonastic subjects, as in (39), and concludes that they actually behave as sentence adverbs.

(39) It seems that John likes pizza.

Note that (39) seems to be synonymous with (40):

(40) Apparently, John likes pizza.

Assuming that the expletive subject in (39) is forced for strictly grammatical reasons, note that a verb that takes an expletive may often occur as a parenthetical, in the position of sentence adverbs:

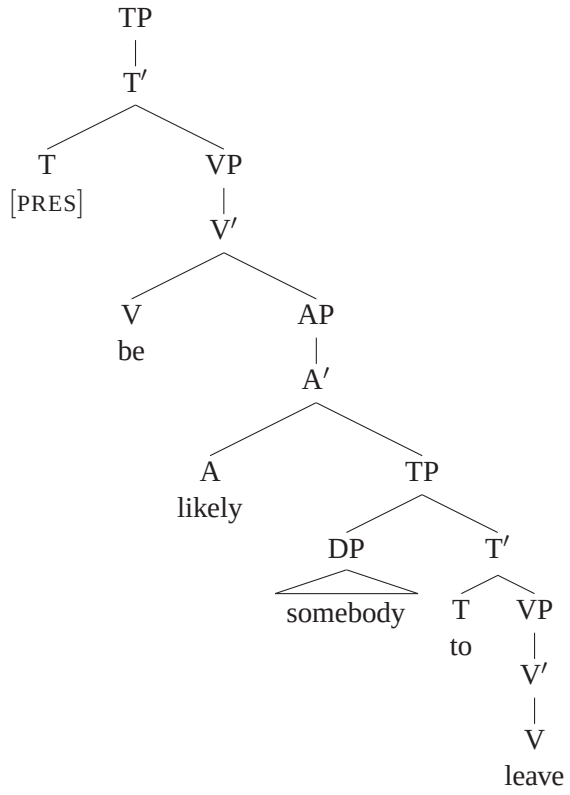
(41) John, it seems (to me), likes pizza.

(42) John, apparently, likes pizza.

We can account for Williams' insight by assigning raising verbs, and sentence adverbs in general, to the type $\langle t,t \rangle$, the type of sentential negation, also a scope-taking operator, and interpret narrow scope for the subject by subjecting (43) to scope interpretation:

[10] Boeckx shows that this lowering operation is actually compatible with plausible ideas about cyclicity.

(43)



We can see, in fact, that just as the lowered reading is unavailable when the matrix experiencer is quantified, shown in (38), the sentence adverb is impossible when it is quantified by a matrix experiencer:

(44) * John, it seems to every student, is quite intelligent.

Needless to say, the Relativized Minimality account, with quantifier-lowering, has nothing to add about the ungrammaticality of (44). Furthermore, the scope ambiguity persists with a sentence adverb:

(45) Some politician, apparently, will leave.

I must confess to having no analysis of quantifier-adverb scope interactions, but these facts point to a much more general phenomenon than is amenable to a lowering analysis.

4.3 C. The Chain Condition

Rizzi (1986) formulates a representational condition on traces that assimilates them to anaphoric dependencies in general; as such, it crucially relies on the presence of traces as chain links.

In a nutshell, the Chain Condition reduces to the Theta-Criterion, which requires that every argument receive a theta-role, and that the theta-criterion applies to chains, sequences

of co-indexed positions in which each link is in a c-command relation with each other link. This is the general definition of a chain, but for convenience, let us use the term movement chain for a chain formed by movement. Rizzi's account relies on the following definitions:

(46) C = $\{\alpha_1 \ldots \alpha_n\}$ is a chain iff, for $1 \leq i < n$, α_i is the local binder of α_{i+1}.

(Rizzi 1986:66)

(47) θ-Criterion: Given the structure S, there is a set K of chains K = $\{C_i\}$, where C_i = $\{\alpha_{i1}, \ldots, \alpha_i\}$, such that:

(i) If α is an argument of S, then there is a $C_i \in K$ such that $\alpha = \alpha_i$ and a θ-role is assigned to C_i by exactly one position P;

(ii) If P is a position of S marked with θ-role R, then there is a $C_i \in K$ to which P assigns R, and exactly one α_{ij} in C_i is an argument.

(Rizzi 1986:67)

The Chain Condition rules out an anaphor head of a movement chain intervening between the head and the tail of a movement chain with which it is co-indexed, as in (48):

(48) * Gianni si è stato affidato.
Gianni$_i$ to himself$_i$ was been entrusted t_i t_i

(Rizzi 1986, ex. 9a)

That the problem lies solely with the derivation that must be implicated in (48), and not its meaning, can be seen in the acceptability of (49), which seems to be synonymous, but which differs from (49) in that the anaphor is unmoved overtly and occurs to the right of the movement chain's tail:

(49) Gianni è stato affidato a se stesso.
Gianni was been entrusted to himself
'Gianni has been entrusted to himself.' (Rizzi 1986, ex. 9a)

Rizzi derives the contrast between (48) and (49) from his θ-criterion, given in (47): each argument must be in a chain, which is a sequence of co-indexed positions. The locality requirement on chain links in (47) is crucial, and plays a decisive role in ruling out anaphors that intervene between elements moved to A-positions and their traces; the θ-criterion is responsible for such cases as (48). The clitic *si* is assigned a θ-role that is distinct from the θ-role that is assigned to the object of *affidare* 'entrust'; the result is a configuration in which the object trace, which is in a position in which it receives its θ-role, acts as a local binder for the trace of the clitic. Hence, there is no well-formed chain formation for the structure that obeys the θ-criterion. *Si* and its trace cannot form a chain, because the trace of the object intervenes, causing *si* to fail to be a local binder for the trace; *si*'s intervention between the derived subject and the derived subject's trace will likewise block chain formation between the derived subject and its trace.

However, as shown in Baltin (2003), the Chain Condition (or θ-criterion) will incorrectly rule out a structure in which the anaphor and its antecedent have both moved, as in (50):

(50) They would [DP those kids]$_i$ [PP [P to][each other]$_i$] [VP introduce [DP t]$_i$ [PP t]$_i$].

(Baltin 2003, ex. 42)

(50) is based on a pseudo-gapping example in which the direct object A-binds the indirect object, and both are pseudo-gapping remnants:

(51) Although they wouldn't introduce these kids to Tom and Sally, they would those kids$_i$ to each other$_i$ _____.

When an argument is encountered, it heads a chain, and by the θ-criterion, each chain must receive a θ-role, presumably accomplished by the tail of the chain occurring in a θ-position. Overtly, a direct object and an indirect object occur. Because they are co-indexed and the object c-commands the indirect object, it is in principle possible to form a chain. However, there is no chain that could be constructed from all four elements (the direct and indirect object and their two traces) without violating the θ-criterion. Nevertheless, the structure is perfectly acceptable.

It seems, therefore, that the Chain Condition, which relies on A-traces and which is couched as a representational condition, is problematic; in that article, Baltin (2003) relies on a derivational account of A-binding in which it takes place at the end of the first phase. Therefore, raising of an anaphor will generally interfere with the binding relationships that it needs to be established. I confess that I do not have an alternative explanation for the very interesting facts that Rizzi noted in (47) and (48), but the Chain Condition is clearly not a definitive area of support for the existence of A-traces.

5 Previous accounts of A-traces

5.1 A. Lasnik (1999)

Lasnik (1999) presents a great deal of evidence that A-traces do not reconstruct. One of his arguments demonstrates the optionality of raising an ECM subject into the matrix, and is based on Kayne (1985), who noted that in the *make out* construction, an ECM subject can appear either before or after the particle *out*:

(52) a. He made Sally out to be a liar.
b. He made out Sally to be a liar.

Interestingly, when the infinitive is negated, a universally quantified ECM subject can only take wide scope with respect to the negation if it appears before the particle:

(53) He made every person out not to like Sally.

However, a universally quantified subject can take narrow scope with respect to the negation if it follows the particle:

(54) He made out every person not to like Sally.

Given the presence of the particle in the matrix, an ECM subject that is separated from its infinitive by the particle must itself be in the matrix. If scope is clause-bound, the negation of necessity has a lower scope than any element in the matrix; if the ECM is in the matrix, it will necessarily scope over the negation.

The word order in which the ECM subject is adjacent to its infinitive, on the other hand, is compatible with a lack of raising, and corroborating this lack of raising is an understood scope in which the ECM subject can scope below the negation, which, as just mentioned, is trapped within the infinitive. Hence, subject-to-object raising is transparently justified by word order facts, but understood scope facts when such raising is seen motivates a conclusion that is germane to our present concerns: the absence of scope reconstruction.

Lasnik suggests that the absence of reconstruction effects with A-traces leads to the conclusion that A-traces do not exist, a conclusion with which I agree, but his reasoning that leads to his conclusion is somewhat different from mine. He argues that there is no need for A-traces if one views theta-roles to be characterized in terms of features on the elements that bear them, features which are carried along by movement. He argues not that the traces are deleted, but that they are not created in the first place.

My stance is somewhat different, in that the present paper argues that the traces are created, but are deleted. Ockham's Razor, and the overall unity of A-movement processes, argue for the deletion view. In this context, the analysis of copy-raising is highly relevant. The best account of the process relies on the retention of the original in addition to the creation of the copy. The original is presumably retained for a PF-reason; its presence is needed to check a morphological feature in the original position. By contrast, in non-copy-raising, no PF reason forces retention of the original, and the trace deletes. Not creating the trace (the original) in cases in which it fails to show up would create a bifurcation between copy-raising and non-copy-raising; the original would be created (and retained) in copy-raising, but would not be created at all in non-copy-raising. Additionally, the non-creation account would not unite the non-existence of these A-traces with the absence of reflexive readings of null objects in Chinese, Japanese, and Korean which were noted in connection with (14).[11]

6 Semantic accounts of A-traces

In this section, I shall show that one a priori appealing advantage of A-traces, that they permit all semantic interpretation to occur at a single level, is not really a clear-cut advantage,

[11] Jim Wood has informed me of the existence of a recent alternative to Lasnik?s analysis that has been proposed by Cedric Boeckx (Boeckx 2008), in which copying is replaced by a re-merge operation, in which a copy is not created, but the original is simply re-merged in a new position. While I have not yet absorbed fully the ramifications of this proposal, it would seem to be subject to the same criticisms as is Lasnik's.

and that theta-roles could simply be determined at First Merge.

One currently finds a consensus in Minimalist circles that theta-roles must be identified at LF, so that all interpretation is done at LF. It was not always so. In the early 1970's, semantic interpretation was not done at a single level; thematic relations were interpreted at deep structure, and other aspects of interpretation, such as quantifier scope and binding, were determined at surface structure (Chomsky 1971). With the advent of trace theory (Wasow 1972, Fiengo 1974, 1977, Chomsky 1973), the prospect of doing semantic interpretation at surface structure was raised. After all, surface structures enriched with traces now contained all of the information that the semantic component needed, since such structures could now contain a history of movement.

However, the use of A-traces to allow all semantic interpretation, including thematic relations, to be done at the end of a derivation (surface structure at that time, now LF) is, I would contend, a kind of "mission creep" for traces. A unitary final level for all interpretation was originally a consequence of trace theory, but was never really an argument for traces. The earliest motivation for traces (see, in particular Fiengo 1977 and Chomsky 1973) was based on binding-theoretic considerations. For example, Fiengo (1977) argued that rightward movement rules covered up the traces with lexical elements such as the expletives *it* and *there* because otherwise traces would improperly bind their antecedents. Such an argument relied crucially on traces being present to participate in the relevant binding configurations. Similarly, Section 3.1 of the present paper discusses Chomsky's (1973) argument for A-traces as being necessary to create binding domains within which anaphors must be bound in order to allow the correct binding patterns.

These arguments, while valid at the time that they were put forward, are no longer germane to the issue of whether or not A-traces are necessary. I have shown, in my discussion of Chomsky's argument, that the derivational alternative which he rejected at the time gains initial plausibility from his later (2000, 2001) development of phase theory, so that binding could simply take place at the end of the internal phase construction. Similarly, the particular phenomena that Fiengo accounted for by invoking rightward movement rules now receive treatments that do not invoke rightward movement. For example, the expletive *there* construction, which was earlier analyzed as rightward movement of the associate to a position after *be*, was re-analyzed by Stowell (1978) as generation of the associate in the post-*be*, presumably VP-internal position, with insertion of the expletive in [Spec,TP] (in current terms), in order to satisfy T's EPP feature. More generally, within the context of his Linear Correspondence Axiom (LCA), Kayne (1994) has re-analyzed what had previously been considered to be rightward movement phenomena as (sometimes a series of) leftward-movements. If this is right, such phenomena no longer support the postulation of traces.

Interestingly, Lasnik (1999), after suggesting that A-traces do not exist, suggests a way in which the non-existence of A-traces could be made compatible with the interpretation of thematic relations at LF: by viewing theta-roles as features which can be assigned to and retained on DPs which have been moved. So, for example, assume that *kiss* takes an agent and a theme, and its lexical entry is as in (51):

(55) kiss +[___DP]
+agent <+theme>

As is commonplace in theories that assume the Universal Alignment Hypothesis (Perlmutter & Postal 1977) or the Uniformity of Thematic Assignment Hypothesis (UTAH; Baker 1988), the agent is assigned in [Spec,vP] (Kratzer 1996), and the theme in [Spec,VP]. However, in a passive sentence such as (56), the theme has been moved, ultimately ending up in [Spec,TP], presumably by A-movement.

(56) Sally was kissed.

In relevant respects, the LF for (56) will be (57).

(57) [TP [DP +theme Sally][T′ [T was][VP [V′ [V kissed]]]]]

In other words, the linking conventions, which hold at the outset (D-Structure in earlier theories, or first Merge in Minimalism), do not hold after movement, but this is not a problem in a theory which takes theta-roles to be features, which can be carried along with moving elements under movement.

Nevertheless, Jackendoff has pointed out quite forcefully and convincingly (see Jackendoff 1987 in particular) that the conception of theta-roles as features (lexical entries which show the lists of features assigned to arguments are called theta-grids) is too unconstrained, and allows in principle any combination of theta-roles assigned to arguments. Levin & Rappaport-Hovav (1988), for example, note (58) (their (35b)) as an example of an unattested but predicted theta-grid:

(58) [+Agent], [+Location], [+Experiencer], [+Instrument]

This would be impossible in a system such as Jackendoff's, in which there are no theta-roles per se with any status, but rather just propositions in a semantic meta-language (which for him express the notion of travel or location of an entity), of which the elements that we label as theta-roles are just constituents of these propositions. For example, *give*, instead of having the plausible theta-grid in (59), would be represented along the lines of (60) in Jackendoff's system:[12]

(59) give, [+Source], [+Theme],[+Goal]

(60) GO, [ENTITY$_j$], [FROM [ENTITY$_i$], [TO [ENTITY$_k$]]]

In other words, the theme would be the entity traveling (the argument of GO, in (60)), the source would be the argument of FROM, and the goal would be the argument of TO. The indices on the entities would correspond to the grammatical functions that would house the nominals that bear those conceptual relations.

[12]This is a gross over-simplification of Jackendoff's system, for which I refer the reader to Jackendoff (1990) for a more complete explication. For one thing, it ignores the distinction made by Jackendoff, as well as Grimshaw (1990), between an aspectual tier or aspectual structure (which would represent causes, for example) and thematic structure, for which the notion of travel or location of an entity would be represented.

Currently, probably most influenced by Hale & Keyser (1993), Minimalism has also come to eschew traditional thematic relation labels except as convenient short-hand, without any theoretical status. Chomsky (1995:313) comments that "A θ-role is assigned in a certain structural configuration; β assigns that θ-role only in the sense that it is the head of that configuration. . . " Thus, an agent is simply that DP that is in [Spec,vP]. Nothing more need be said about the agent-hood of the DP; its presence in that structural configuration is sufficient.

Chomsky's remarks about the interaction of θ-role determination and movement are instructive. He notes that a non-trivial chain is not in a configuration, only a link of the chain. A non-trivial (i.e. more than one link) chain is not in a configuration for θ-role assignment, and so raising from a θ-position to another θ-position is impossible. Accordingly, the only recipient of a θ-role is a trivial, single-linked, chain. Chomsky (1995:68) thus comments that "θ-relatedness is a 'base property', complementary to feature checking, which is a property of movement."

This property is fortuitous, since it dovetails with the arguments in this paper that an A-trace would necessarily violate the binding theory in most cases (the environment for copy-raising being an exception, since the trace would convert to a pronoun, a permissible operation). Since θ-role assignment can only take place under first merge, why not simply determine the θ-role of an argument when it is first introduced into the structure, along the lines of the Extended Standard Theory (Chomsky 1971) but minus the level of deep structure?

In fact, the arguments for A-traces are, as far as can be determined from inspection of the literature on the semantics of traces in general (see Sauerland 1998, Fox 1999, 2000 in particular), seem to be non-existent. In the case of A-bar traces, the trace functions as a variable, with the head of the chain being construed as an operator. A-chains could be seen analogously, and in fact have been (e.g. by Sauerland 1998), with the A-trace being seen as a variable bound by a lambda-operator. One problem for translating all apparently syntactically predicative expressions was raised by Williams (1983), who noted that VPs, while generally treated as lambda-expressions (by Sag 1976 and Williams 1977, among others), must receive a rather different semantic treatment when they take pleonastic, and hence semantically empty, subjects, as noted in Section 3.2 (see, in particular, (39)). Interestingly, a common response to the existence of such subjects and such constructions has been to stipulate that such subjects are in a special class (see Sag's 1982 discussion of "ugly objects"). Indeed, Rothstein (2001) analyzes such cases as "vacuous lambda-abstraction".

However, the postulation of vacuous lambda-abstraction brings this attempt to maintain the generality of lambda-abstraction into conflict with Chomsky's (1991) ban on vacuous quantification, as a consequence of his Principle of Full Interpretation (Chomsky 1986), who notes that natural language never seems to express vacuous operators, in what are apparently A-bar positions, that bind no variables. If this is right, then the postulation of vacuous lambda abstraction fails to explain why there seems to be no evidence for vacuous quantification in natural language.

An argument against bifurcating semantic interpretation along the lines of the Extended

Standard Theory, in which thematic relations are determined at first Merge and quantifier scope interpretation is determined at the end of the derivation, might be that Ockham's Razor would militate against it. This use of Ockham's Razor, I would maintain, is unwarranted, and invites Chomsky's (1972) reply to another such use of Ockham's Razor, i.e. the arguments by proponents of Generative Semantics that a theory that simply had an underlying level of semantic representation plus transformations was preferable to a theory that had syntactic rules generating structures and interpretive rules interpreting those structures:

> [...] it is correct to say that the "most conservative" theory is one that has no more theoretical apparatus than what was described: phrase-markers and transformations. The descriptive power of such a system is enormous. Hence this is a rather uninteresting theory. (Chomsky 1972:68)

In other words, a theory that has fewer levels but prioritizes the paucity of levels to the extent that it is placing apples and oranges together within one level, sacrificing the chance of arriving at a natural characterization of what is an apple and what is an orange, is not really advancing our understanding of fruits.

Applied to the topic at hand, if determination of θ-roles makes use of information only available at the outset of placement in a structure, i.e. First Merge, then it is radically different from, say, quantifier scope, or the determination of operator-variable structures, which potentially are determined non-locally.

7 Conclusion

In this paper, I have argued that A-traces, if they are understood as copies, are created, but cannot freely survive; the discussion of the copy theory has made the former point, given the assumption that one would like to relate copy-movement and non-(overt)-copy-movement, and the discussion of the binding theory has argued for the latter point. A-copies simply can't survive at the level of grammar at which the binding theory applies, except when they can convert to pronouns without violating Condition B. In other cases, the binding theory would require an anaphor, and no mechanism exists to convert a non-anaphor (i.e. a pronoun or an R-expression) to an anaphor. Therefore, such a copy, which would otherwise be A-bound, would have to delete.

This is thus an example of deletion as repair, of the sort introduced by Ross (1969), except that the repair in this instance would be of a semantic, binding theory violation, rather than what Merchant (2001) has characterized as a PF-problem. If this is right, it indicates that deletion must apply much earlier than PF, in the overt syntax, as argued by Baltin (to appear), because the deletion has semantic consequences.

Interestingly, I have argued that A-traces can't exist, but I have also suggested that they don't have to exist, if one allows thematic relations to be determined at the outset, rather than waiting until the end. In this way, I have strengthened Lasnik's (1999) conjecture that A-traces might not exist to a reality, and have tried to give a principled reason for their non-existence.

References

Baker, Mark C. 1988. *Incorporation: a theory of grammatical function changing.* Chicago: University of Chicago Press.

Baltin, Mark. 2003. The Interaction of Ellipsis and Binding: Implications for the Sequencing of Principle A. *Natural Language and Linguistic Theory* 21:215-246.

Baltin, Mark. To appear. Deletion Versus Pro-Forms: An Overly Simple Dichotomy. *Natural Language and Linguistic Theory*.

Baltin, Mark, & Jeroen van Craenenbroeck. Forthcoming. On Becoming A Pronoun. Ms.

Bobaljik, Jonathan David. 1995. Morphosyntax: The Syntax of Verbal Inflection, Unpublished Doctoral Dissertation, MIT.

Bobaljik, Jonathan David. 2002. A-Chains At the PF Interface: Copies and "Covert" Movement. *Natural Language and Linguistic Theory* 20:197-267.

Boeckx, Cedric. 2001. Scope Reconstruction and A-Movement. *Natural Language and Linguistic Theory* 19:503-548.

Boeckx, Cedric. 2008. *Bare Syntax*. Oxford, Oxford University Press.

Chomsky, N. 1972. Some Empirical Issues in the Theory of Transformational Grammar. In *The Goals of Linguistic Theory*, ed. Stanley Peters, 63-130. Englewood Cliffs, New Jersey: Prentice-Hall, Inc.

Chomsky, N. 1982. *Some Concepts and Consequences of the Theory of Government and Binding*. Cambridge, Mass.: MIT Press.

Chomsky, Noam. *Lectures on Government and Binding: The Pisa Lectures.*

Chomsky, Noam. 1973. Conditions on Transformations. In *A Festschrift for Morris Halle*, ed. Stephen Anderson & Paul Kiparsky, 232-286. New York: Holt, Rinehart, & Winston.

Chomsky, Noam. 1981. *Lectures on Government and Binding*. Dordrecht: Foris Press.

Chomsky, Noam. 1986. *Knowledge of language: its nature, origin, and use.* New York: Praeger.

Chomsky, Noam. 1993. A Minimalist Program for Linguistic Theory. In *The View From Building 20: Essays In Honor of Sylvain Bromberger*, ed. Ken Hale & Samuel Jay Keyser, 1-52. Cambridge, Mass.: MIT Press.

Chomsky, Noam, and Lasnik, Howard. 1993. The Theory of Principles and Parameters. In *Syntax: An International Handbook of Contemporary Research. Vol. 1*, ed. Joachim

Jacobs, von Stechow, Arnim, Sternefeld, Wolfgang, & Vennemann, Theo, 506-569. Berlin: Walter de Gruyter.

Chomsky, Noam. 1995. Categories and Transformations. In *The Minimalist Program*, ed. Noam Chomsky. Cambridge, MA: MIT Press.

Chomsky, Noam. 2000. Minimalist Inquiries: The Framework. In *Step by Step: Essays In Honor of Howard Lasnik*, eds. Roger Martin, David Michaels and Juan Uriagureka, 89-155. Cambridge, MA: MIT Press.

Chomsky, Noam. 2001. Derivation By Phase. In *Ken Hale: A Life in Language*, ed. Michael Kenstowicz, 1-52. Cambridge, MA: MIT Press.

Cinque, Guglielmo. 1990. *A Theory of A-Bar Dependencies*. Cambridge, MA: MIT Press.

Deprez, Viviane. 1992. Raising Constructions In Haitian Creole. *Natural Language and Linguistic Theory* 10:191-231.

Emonds, Joseph. 1976. *A Transformational Approach To English Syntax.* New York: Academic Press.

Fiengo, Robert. 1974. Semantic Conditions On Surface Structure. Doctoral Dissertation, MIT.

Fiengo, Robert. 1977. On Trace Theory. *Linguistic Inquiry* 8:35-71.

Fiengo, Robert, and May, Robert. 1994. *Indices and identity*. Cambridge, MA: MIT Press.

Fox, Danny. 1999. Reconstruction, Binding Theory, and the Interpretation of Chains. *Linguistic Inquiry* 30:157-196.

Fox, Danny, and Lasnik, Howard. 2003. Successive-Cyclic Movement and Island Repair: The Difference between Sluicing and VP-Ellipsis. *Linguistic Inquiry* 34:143-154.

Gleitman, Lila. 1995. The Structural Sources of Verb Meaning. In *Language Acquisition: Core Readings*, ed. Paul Bloom, 174-215. Cambridge, MA: MIT Press.

Grimshaw, Jane. 1990. *Argument Structure*. Cambridge, MA: MIT Press.

Hale, Kenneth, & Samuel Jay Keyser. 1993. On argument structure and the lexical expression of syntactic relations. In *The View From Building 20: Essays In Honor of Sylvain Bromberger*, ed. Kenneth Hale & Samuel Jay Keyser, 53-110. Cambridge, MA: MIT Press.

Helke, Michael. 1971. The Grammar of English Reflexives, Unpublished Doctoral Dissertation, MIT.

Heycock, Caroline. 1995. Asymmetries In Reconstruction. *Linguistic Inquiry* 25:547-570.

Hornstein, Norbert. 1995. *Logical form: from GB to minimalism*. Oxford, UK; Cambridge, MA: Blackwell.

Huang, C.-T. James. 1993. Reconstruction and the Structure of VP: Some Theoretical Consequences. *Linguistic Inquiry* 24:103-138.

Jackendoff, Ray. 1987. The Status of Thematic Relations In Linguistic Theory. *Linguistic Inquiry* 18:369-411.

Jackendoff, Ray. 1990. *Semantic Structures*. Cambridge, MA: MIT Press.

Joseph, Brian. 1976. Raising In Modern Greek: A Copying Process? In *Harvard Studies In Syntax and Semantics*, 241-278. Cambridge, Mass.

Kayne, Richard S. 1981. On Certain Differences between French and English. *Linguistic Inquiry* 12:349-371.

Kayne, Richard S. 1994. *The Antisymmetry of Syntax*. Cambridge, MA: MIT Press.

Kim, Soowon. 1999. Sloppy/Strict Identity, Empty Objects, and NP-Ellipsis. *Journal of East Asian Linguistics* 8:255-284.

Kratzer, Angelika. 1996. Severing the External Argument From the Verb. In *Phrase Structure and the Lexicon*, eds. Johan Rooryck and Laurie Zaring, 109-137. Dordrecht: Kluwer.

Kratzer, Angelika. 2009. Making A Pronoun. *Linguistic Inquiry* 40:187-237.

Lasnik, Howard. 1999. Chains of Arguments. In *Working Minimalism*, ed. Samuel David Epstein and Norbert Hornstein, 189-215. Cambridge, Mass.: MIT Press.

McCloskey, James. 1991. There, It, and Agreement. *Linguistic Inquiry* 22:563-567.

Merchant, Jason. 2001. *The Syntax of Silence*. Oxford, U.K.: Oxford University Press.

Moore, John. 1998. Turkish Copy-Raising and A-Chain Locality. *Natural Language and Linguistic Theory* 16:149-189.

Otani, Kazuyo, & John Whitman. 1991. V-Raising and VP-Ellipsis. *Linguistic Inquiry* 22:345-358.

Perlmutter, David M., & Paul M. Postal. 1977. Toward A Universal Characterization of Passive. Paper presented at *Berkeley Linguistics Society*, Berkeley, Ca.

Pesetsky, David. 1987. Wh-In -Situ: Movement and Unselective Binding. In *The Linguistic Representation of (In)Definiteness*, ed. Eric Reuland, and Alice ter Meulen, 98-127. Cambridge, MA: MIT Press.

Pesetsky, David, & Esther Torrego. 2001. T-to-C Movement: Causes and Consequences. In *Ken Hale: A Life In Language*, ed. Michael Kenstowicz, 355-426. Cambridge, Mass.:

MIT Press.

Pica, Pierre. 1987. On the Nature of the Reflexivization Cycle. Paper presented at *Northeast Linguistic Society.*

Postal, Paul. 1969. On So-Called Pronouns In English. In *Modern Studies In English*, eds. David Reibel and Sanford Schane, 201-223. Englewood Cliffs, New Jersey: Prentice-Hall.

Postal, Paul. 1971. *Cross-Over Phenomena.* New York: Holt, Rinehart, & Winston.

Rappaport, Malka & Beth Levin. 1988. What To Do With Theta-Roles. In *Syntax and Semantics,* ed. Wendy Wilkins, 7-36. New York: Academic Press.

Reinhart, Tanya & Eric Reuland. 1993. Reflexivity. *Linguistic Inquiry* 24:657-720.

Reuland, Eric. 2001. Primitives of Binding. *Linguistic Inquiry* 32:439-492.

Rizzi, Luigi. 1986. On Chain Formation. In *Syntax and Semantics*, ed. Hagit Borer, 65-95. New York: Academic Press.

Rizzi, Luigi. 1990. *Relativized Minimality*. Cambridge, MA: MIT Press.

Rizzi, Luigi. 1997. The Fine Structure of the Left Periphery. In *Elements of Grammar,* ed. Liliane Haegeman, 281-337. Dordrecht, Netherlands: Kluwer.

Rogers, Andy. 1974. Physical Perception Verbs In English: A Study In Lexical Relatedness. Doctoral Dissertation, UCLA.

Ross, John Robert. 1967. Constraints on Variables In Syntax. Doctoral Dissertation, MIT.

Ross, John Robert. 1969. Guess Who. In *Chicago Linguistics Society,* ed. R. Binnick et. al., 252-286. University of Chicago.

Rothstein, Susan. 2001. *Predicates and Their Subjects.* Dordrecht: Kluwer.

Sag, Ivan. 1976. Deletion and Logical Form. Doctoral Dissertation, MIT.

Sag, Ivan. 1982. NP-Movement Dependencies. In *The Nature of Syntactic Representation*, ed. Pauline Jacobson & Geoffrey Pullum, 427–466. Dordrecht: Kluwer.

Sauerland, Uli. 1998. The Meaning of Chains. Doctoral Dissertation, MIT.

Ura, Hiroyuki. 1994. Varieties of Raising and the Feature-Based Theory of Bare Phrase Structure. In *MIT Occasional Papers In Linguistics*. Cambridge, MA: MIT.

Vanden Wyngaerd, Guido &, and Zwart, Jan-Wouter. 1991. Reconstruction and Vehicle Change. In *Linguistics in the Netherlands*, ed. Frank Drijkoningen, & Van Kemenade, Ans, 151-160. Amsterdam: John Benjamins & Co.

Wasow, Thomas. 1972. Anaphoric Relations In English. Doctoral Dissertation, MIT.

Williams, Edwin. 1977. Discourse and Logical Form. *Linguistic Inquiry* 8:101–139.

Williams, Edwin. 1983. Syntactic Versus Semantic Categories. *Linguistics and Philosophy* 6:423-446.

Xu, Liejiong. 1986. Free Empty Category. *Linguistic Inquiry* 17:75-93.

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