Remarks
and
Replies

External NPs versus Annotated Deep Structures*

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1. Hasegawa's "Transformations and Semantic Interpretation" (henceforth TSI) is devoted to criticism of some analyses that generative semanticists have proposed and to a detailed discussion of an alternative analysis, within the framework of a particular variety of interpretive semantics, of the subject matter of one of the analyses he criticizes.
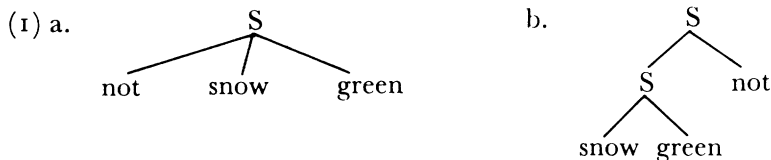
TSI (and its prior incarnation, Hasegawa 1970) is principally noteworthy for the explicitness of its proposals about what semantic interpretation rules (SIRs) do and what a semantic representation consists of; hitherto such explicitness in works by interpretive semanticists has been conspicuously absent. Hasegawa's SIRs give rise to what I will dub an annotated deep structure, i.e. a deep structure such as one finds in Chomsky (1965), supplemented by features attached to its nodes and relations between its nodes. Except for limited use of "ideal" nodes (Hasegawa uses one such, namely a node called "speaker"), all and only the nodes of the deep structure appear in the semantic representation.[1] His SIRs simply add such features and relations to the nodes of a deep structure.

One basic aspect of Hasegawa's semantic representations, however, remains unclear, namely what their relationship to linguistic facts is supposed to be. The only criterion of adequacy for semantic representations that Hasegawa suggests in TSI is the rather trivial one that a sentence that is n ways ambiguous should have exactly n distinct semantic representations. Hasegawa thus has placed no empirical constraints

[1] This mode of semantic representation appears implicitly in much work by interpretive semanticists. For example, the treatments of the scope of negatives and quantifiers presented in Jackendoff (1969) involve a relation of "scope" between the quantifier or negative and a node (or nodes) in a syntactic structure of the sentence. Since Jackendoff evidently does not allow transformations to create nodes, each of those nodes corresponds to a deep structure node, and the result can be viewed as a deep structure annotated with the relation "in the scope of". Indeed, I would claim that only by so viewing it can one make sense out of the interaction of the various SIRs that Jackendoff's treatment would require.

on what semantic representations are admissible, only on how many of them there can be for a fixed sentence. By contrast, work in generative semantics has taken the position (implicitly in such early works as J. McCawley 1967a, 1970a; explicitly in such later works as J. McCawley 1972a, G. Lakoff, 1972) that semantic representation must provide the analysis of content that is relevant for logic. See, for example, my arguments (J. McCawley, 1972a) that rules of inference in logic can be given a coherent interpretation only if they are assumed to apply to constituents rather than to strings (e.g. in applying the rule of inference "p or q; not p; therefore, q," p and q must be matched to semantic constituents of the premises, not just to strings of symbols) and that the constituent structure demanded by logic requires that, for example, a negative clause have a semantic structure not like (1a), which corresponds to Katz and Postal's treatment of negation, but rather like (1b):[2]

(1) a.

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              S
          ___/|\___
        not  snow  green
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b.

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              S
           __/ \__
          S       not
        _/ \_
     snow  green
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I will argue below that the semantic structures that Hasegawa sets up do not contain the constituents that must be present in order to apply logical rules of inference to the sentences in question. This will demonstrate that Hasegawa's proposals are inadequate relative to what generative semantics takes to be the function of semantic representation. If Hasegawa holds a different conception of the function of semantic representation, perhaps he is able to show that relative to his conception of its function, his type of semantic representation is adequate and mine is not. However, he has given no clue as to what he would accept as evidence for or against a proposed semantic representation.

    To the extent that it is unclear what function semantic representation is supposed to play for Hasegawa, it is unclear what he assumes a grammar is supposed to do; thus, it is also unclear whether a comparison between the rules that he proposes and those that I and other generative semanticists have proposed makes any sense. Since Hasegawa assumes in TSI that such a comparison does make sense, I will assume throughout most of this paper that he in fact agrees with me as to what function semantic representation is supposed to fulfill, occasionally noting passages in TSI that conflict with that assumption. I emphasize at the outset that only a comparison of the rules relating meaning to surface structure in one theory with those in the other could be of any significance. A comparison between just the "syntax" of an interpretive-semantic grammar and the rules relating meaning to surface structure in a generative-

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[2] The order of elements in (1a, b) is not significant. When supplemented by the conclusions that negation is a predicate and that (at least) English has predicate-first order until late in derivations (J. McCawley 1970b), the conclusion about logical constituent structure yields a semantic structure which is the mirror image of (1b).

semantic grammar makes as little sense as a comparison between a tape recorder and a speech synthesizer: in either case, the things being compared do not even purport to fulfill the same function. At one point (see objection (ii) in Section 2.1, below), Hasegawa appears to fall into the error of comparing his syntax with my whole grammar and accusing the latter of complexity that the former does without, though he generally avoids that error.

2. Much of TSI is devoted to discussion of my proposal (1967a, 1970a) that in semantic structure the content of NPs is outside of the clauses in which those NPs end up, with no restriction in principle on how much higher than that clause the source of the NP is. For example, I proposed[3] (2a, b) as underlying structures for the two senses of (3):

(2) a.
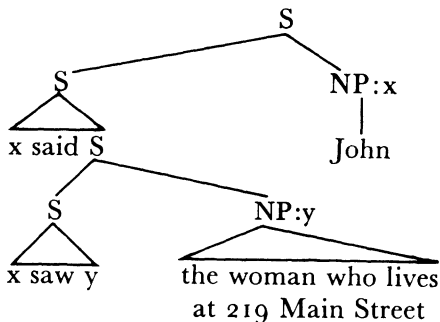
b.
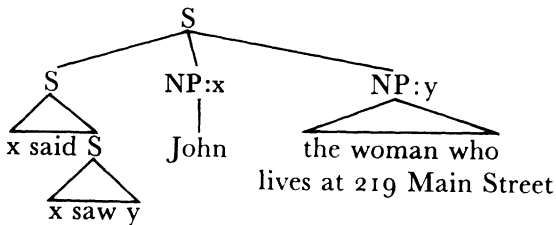
    (3)   John said that he had seen the woman who lives at 219 Main Street.

namely, a sense in which *the woman who lives at 219 Main Street* is part of the proposition that John is being said to have expressed,[4] and a sense in which that NP is the speaker's description of a person that John had mentioned.

2.1 While I still subscribe to this proposal as described verbally in the first sentence of section 2, I reject most of the specific details of (2). In proposing (2), I perpetrated

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    [3] This is the version of my trees which appears in TSI. Hasegawa, with my approval, removed some pointless proliferation of node labels that appeared in the papers of mine cited above.
    [4] I emphasize that it is the proposition and not the words that is being attributed to John. Either sense of (3) could perfectly well be a report of something that John said in Albanian or Bangubangu, in which case the speaker would be supplying all the words.

the grave error of treating all NPs as if they were "referential" in the sense of Donnellan (1966),[5] i.e. as if they were merely the material that someone uses to identify the things that he is talking about, as in Donnellan's celebrated example *The man in the corner who is drinking a martini is a CIA agent*, which is true or false solely depending on whether the person referred to is a CIA agent, independent of whether his glass contains a martini or a daiquiri or chicken soup. Karttunen (1971) has correctly pointed out that the NPs in many of my examples cannot be referential; cf. in particular, the Bach-Peters sentence (4):

(4)   The pilot who shot at it hit the MIG that chased him.

In addition Karttunen has noted that (4) is ambiguous and that its two senses cannot be distinguished unless the two NPs are treated as involving definite-description operators, either of which could be within the scope of the other. If I were writing today about the material in question, I would be careful to distinguish between referential NPs (the content of which is a presupposition involving a constant referential index) and "attributive" NPs (the content of which is a quantifier or quantifier-like element, plus material that specifies the range of the corresponding bound variable). In addition, I would have the nouns originate in predicate position of sentences, as proposed in Bach (1968); that is, in my current view of the semantic structure of the various senses of (3), I would have the Ss "x is called John" and "y is the woman who lives at 219 Main Street" (or whatever more abstract structure underlies them) rather than the "NP:x" and "NP:y" of (2). However, since Hasegawa's objections (except possibly for objection (v)) apply equally as much to what I would say now as to what I said in 1967, I will say no more about my current position on the derivation of NPs and turn to Hasegawa's objections.

2.2. Objections

(i) ". . . there is little independent syntactic evidence for deep structures like [2a] and [2b]" (Hasegawa 1972, 143). Little is more than none, and Hasegawa later refers to one fact that has been offered (Binnick 1970, J. McCawley (to appear a)) in support of the claim that *the woman who lives at 219 Main Street* can originate either inside or outside the complement of *say*, namely that in languages that put the

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[5] As opposed to the sense of Quine (1960, 142), who uses the word "referential" for those NPs to which the principle of existential generalization ("$F(a)$; therefore, $\exists x\, F(x)$") can be applied. Note that while the first NP in *The winner of the contest will receive a trip to Scranton* is referential in Quine's sense (i.e. from the example sentence one can infer $\exists x$ (x will receive a trip to Scranton)), it is not referential in Donnellan's sense, since *the winner of the contest* is part of the proposition that the speaker is conveying and not just the speaker's way of identifying some individual that he is talking about; thus, if one denies the sentence, he is not asserting of some individual that that person will not receive a trip to Scranton. It should also be observed that neither sense of "referential" is equivalent to 'has a referent'. As pointed out by Karttunen (1969), *his wife* in *The man who loves his wife is angry* may have a referent but is not referential in Quine's sense nor, a fortiori, in Donnellan's: if there is exactly one man who loves his wife and also a second man who loves that man's wife, there is no one meeting the description "the man who loves a", where a is the first man's wife, which means that from the example sentence one cannot infer $\exists x$ (the man who loves x is angry).

complement of such verbs into the subjunctive (e.g. French or Spanish), the two interpretations of (3) correspond to different surface forms, one with indicative mood and one with subjunctive mood in the relative clause. A similar argument can be based on data from English. Specifically, tense sequence does not apply to verbs in referential NPs:

(5) a. Last year, Max told me he was dating a girl that you knew. (like (2a))
  b. Last year, Max told me he was dating a girl that you know. (like (2b))

If sequencing of tenses takes place in complements of past tense verbs before external NPs are moved in, exactly these data will result.

 Hasegawa rejects these facts as evidence for (2) for reasons I will discuss below in connection with objection (vi); however, that leaves quite unclear what kind of evidence he would regard as "syntactic". Note that two distinct issues are involved in objection (i): whether there is evidence for (2a) and (2b) as some kind of linguistically significant representation of (3) in its two senses, and whether various pieces of evidence for (2a) and (2b) are syntactic. Hasegawa claims that neither the semantic structures of the two readings of (3) nor any of their syntactic representations involve "external" NPs. I have said "claims" rather than "argues", since his discussion of his proposed semantic structures purports only to show them to be viable, not to show them to have any advantages as semantic representations over proposals with external NPs. In the event that semantic representations can be shown to require external NPs, then objection (i) reduces to a statement of policy: that Hasegawa insists on drawing a line between syntax and semantics and putting external NPs on the semantic side of that line. Such a policy is a matter for argument only to the extent that it is supplemented by claims about the proposed syntax-semantics dichotomy that have testable consequences.

 (ii) "This analysis also requires a transformation that inserts various noun phrases into appropriate positions in lower sentences. It will be shown later that my treatment makes such a transformation superfluous" (Hasegawa 1972, 143–144). Hasegawa's proposals do without such a transformation only at the expense of having semantic interpretation rules (SIRs) that add "annotations" to a deep structure. The only advantages Hasegawa has adduced for his SIRs over my transformation are contained in objections (iii) and (v).

 (iii) "In general, there do not seem to be any well-established transformations which introduce elements of higher sentences into lower sentences which have already undergone a cyclic application of transformational rules" (Hasegawa 1972, 143, fn. 5). Whether one accepts this generalization or not depends on what he considers to be "well-established transformations"; certainly tense-sequence would appear to violate it, as does the conjunction reduction observed in (6)

(6) Chomsky and Hockett claim that word boundaries are phonological and semantic respectively.

which takes an input in which *and* conjoins main clauses and gives an output in which it conjoins elements of the subordinate clause. Thus, to adopt this generalization, one must accept a distinction between "syntactic rule" and "SIR" and treat tense sequence and conjunction reduction as SIRs. The generalization is at best as well established as such a division of rules of grammar into two systems.

(iv) ". . . deep structures like [2a] would have to be blocked when the main verb is *realize*" (Hasegawa 1972, 144). "In order to express this contrast between *realize* on the one hand and verbs such as *say* and *think* on the other hand, along the lines suggested by McCawley, it would be necessary to place intricate well-formedness conditions on semantic representations . . ." (Hasegawa 1972, 144). Hasegawa's factual claim about *realize* is false, and even if it were true it would not constitute evidence for his analysis; the device by which he restricts the interpretation of sentences with *realize* (his rule (32)) is a "well-formedness condition on semantic structures" and is a notational variant of (and thus no more "intricate" than) that which he alleges my treatment requires.

Hasegawa's claim about *realize* suggests that he was looking for the wrong ambiguity in sentences such as (7):

(7)   John realized that he had seen the woman who lives at 219 Main Street.

namely, an ambiguity as to "who supplies the words"; for example, he says "The normal use of *realize* would seem to require that the content of John's realization must be the complement sentence itself: 'I saw the woman who lives at 219 Main Street.'" (Hasegawa 1972, 144). The ambiguity that he should have been looking for is an ambiguity as to what is being attributed to John, and here there appears to be precisely the kind of ambiguity discussed in connection with (3): in one interpretation of (7), *the woman who lives at 219 Main Street* is the speaker's description of an individual and the speaker attributes to John the realization that he saw that individual (in this case there is a presupposition that John saw that individual); in the other interpretation the speaker attributes to John the realization that he saw the woman who lives at 219 Main Street, whoever that might be. In this latter case there is a presupposition that John saw the woman who lives at 219 Main Street, whoever that might be; "whoever that might be" here is a clumsy way of indicating that the NP is to be interpreted "attributively". The ambiguity of NPs in the complement of a factive verb is clearer if the verb is negated:

(8) a.   John doesn't realize that Mary kissed the boy she kissed.
     b.   Bill doesn't regret that Mary is as tall as she is.

Hasegawa's statement that (9a) and (9b) differ in their range of interpretations, (9b) allowing "only the contradictory reading",[6] is also false.

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[6] Hasegawa inaccurately speaks of the reading of (9a) which attributes a contradiction to John as being "contradictory". (9a) in that interpretation could, of course, perfectly well be true. (9b), on the other hand, really is contradictory.

(9) a. John claims that Mary didn't kiss the boy she kissed.
    b. John realized that Mary didn't kiss the boy she kissed.

(9b) is ambiguous between two distinct (though hard to distinguish) contradictory readings. In one reading, the complement of *realize* is the contradictory *Mary didn't kiss the boy she kissed*, which is presupposed, since *realize* is factive. In the other reading, the complement of *realize* is *Mary didn't kiss x*, where x is the person referred to, and there is a presupposition "x is the boy that Mary kissed"; in this case the presuppositions are inconsistent with each other.

(v) ". . . [2a] and [2b] fail to show one essential property of deep structure as an ordered sequence of elements: the ordering of a Sentence and a Noun Phrase expression, or that of one NP expression and another in [2a] and [2b] seems arbitrary" (Hasegawa 1972, 144). Since the question of whether a semantic structure must be ordered is far from settled, this is not much of an objection. Suppose, however, that it has somehow been established that semantic structures and all syntactic representations of sentences must be ordered trees. Does Hasegawa then have a legitimate objection against my proposals? If the conclusions of Morgan (1969) are accepted, then the ordering of the various NPs relative to the Ss is not arbitrary and indeed should be the opposite of what appears in (2): the external NPs of (2) correspond (albeit somewhat indirectly) to presuppositions of the Ss that they are sisters of, which according to Morgan's conclusions implies that they precede them in semantic structure. However, clearly the order of the two NPs in (2b) relative to each other is arbitrary.

The picture is somewhat different if one considers whether my current position is open to an objection analogous to (v). The order of the material in "attributive" NPs relative to the rest of the sentence would be nonarbitrary: there would be a quantifier (taking that in a broad enough sense to include a definite-description operator), and it, being a predicate, would occur in the same position relative to what it is predicated of as would any other predicate, namely to the left; it would be predicated of an NP that describes a set of propositions (e.g. in *All men are mortal*, the *all* is predicated of the set of all propositions "x is mortal" for which x is a man; see J. McCawley (1972a)), with the relative ordering of elements being a special case of the "NP S" order in NPs that describe a set. This still leaves the order of "referential" NPs with respect to each other arbitrary. That, however, does not greatly worry me; since the content of referential NPs plays no role in the proposition expressed (or question asked, etc.) by the sentence, it is not completely clear that it should be considered really to be part of the semantic structure rather than, say, part of the context of the utterance; see point (i) of section 5 in this connection.

(vi) "The theory that assigns two different deep structures to sentences like *John claims that Mary didn't kiss the boy she kissed* predicts that, in principle, it is possible that these deep representations might be realized as totally [sic] different surface

structures, in a way that reflects the deep structural difference . . . In other words it is an accident rather than a necessity that totally [sic] different underlying structures such as [(2a) and (2b)] exhibit the observed constructional unity in surface structure . . . In fact, under the generative semantic approach, this 'accident' becomes all the more striking because much the same phenomena are observed in a totally [sic] different language like Japanese" (Hasegawa 1972, 154–155). Neither generative semantics nor interpretive semantics has a monopoly on language universals. Hasegawa is claiming that the relationship between NPs and the semantic structure of sentences containing them is universal, a claim which a generative semanticist could just as easily make. However, neither theory provides any explanation of why that relationship should be universal, and thus for both theories its universality is equally "accidental".

One aspect of objection (vi) is worth dwelling on. Hasegawa appears to accept the syntactic analogue of a position taken by Sapir on phonology (see J. McCawley (1967a)). Whereas Sapir held that the phonemic inventory of a language must be a subset of its phonetic inventory (i.e. there are no phonemic sound types which do not occur phonetically), Hasegawa apparently holds that the inventory of deep structure configurations must be a subset of the inventory of surface structure configurations (i.e. there is no "configuration", say, in the sense of a node plus the nodes that it directly dominates, which occurs in deep structure but not in surface structure). For example, Hasegawa states that "It might be objected [against objection (vi)] that there are cases where totally different deep structures underlie an identical or near-identical surface structure. But in well-established cases, the possibilities predicted by a particular choice of deep structure receive maximal realization. This is the case with Tough Movement, for instance.

[a]   This fish is easy to eat.
[b]   This fish is eager to eat.
[c]   [Δ eat this fish]$_S$ is easy.
[d]   To eat this fish is easy.

[a] and [b] have a nearly identical surface structure, although their deep structures are radically different. Now [c], the deep structure of [a], is optimal because the kind of surface structure which it *predicts as possible* does actually occur as [d]" (Hasegawa 1972, 155–156, emphasis added).[7]

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[7] Some form of this assumption seems to be at the bottom of a number of analyses proposed by interpretive semanticists. To take one example, Chomsky (1970, 207) and Emonds (1970, 62) argue for a parallelism between the deep structures of NPs and Ss, in particular, that the N is in the same deep structure position relative to its NP as the V is in relative to its S. There are essentially two ways this claim might be fitted into a grammar: either the subject of a nominalization originates in determiner position and Ss have deep subject-verb-object order, or the subject of a nominalization originates as a post-N modifier and Ss have verb-subject-object or verb-object-subject order. Chomsky and Emonds choose the former of these two alternatives even though it commits them to allowing "doubly filled" positions. For example, in order to say that *students* originates in the determiner position in (i)

3. There is one important respect in which objection (vi) has more force than I have indicated. Since Hasegawa's conception of semantic representation is that of an annotated deep structure, he has no level of representation, syntactic or semantic, at which the content of NPs is external to the clauses that they end up in. Thus, to the extent that Hasegawa can justify his type of semantic representation, he can rightfully claim to have shown that it is no accident that the material of an NP appears where it does in surface structure and that ambiguous sentences such as (3) do not instead have two distinct surface constituent structures. I wish to devote this section to Hasegawa's conception of semantic representation and the question of its adequacy.

3.1. Hasegawa introduces two "annotations" in TSI. *a* ("assertor") is a relation between an NP node (including the "ideal" NP node, "speaker") and an S node, with the informal definition: the assertor of S is "the person whose judgment[8] S represents". *d* ("designator") is a relation between an NP node (including "speaker") and another NP node, with the informal definition: the designator of NP is "the person who is reponsible for using this NP to refer". He thus intends exactly one NP node to stand in the *a* relation to each S node and exactly one NP node to stand in the *d* relation to each NP node of the deep structure. His SIRs for attaching the *a* relation to a deep structure are as follows:

(10)   A.   (i) $a(S) = NP'$
          (ii) $a(S) = \text{the speaker}$ $\Big\} \Big/ \#X\left(NP'\begin{bmatrix} +\text{verb} \\ \alpha \ \text{factive} \end{bmatrix}\right)S$

      B.   If $a(S_i) = A$, $a(S_j) = B$, and S_j dominates S_i, then $a(S_i) = A$ or B.

Hasegawa does not make clear his notational convention governing the use of α (it does not fit any notational scheme which I am familiar with), but his remarks make clear that it is supposed to serve to render (i) inapplicable when the verb is factive; that, of course, can be indicated without recourse to novel notational devices (see below). As his rules stand, they would allow only the complement of a nonfactive verb to have something other than "speaker" for its assertor, which conflicts with

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(i)   Any rioting by students will be punished.

they are forced to treat *any* and *students* as both filling the determiner position of the NP. (This conclusion is recognized explicitly by Emonds and implicitly by Chomsky. Chomsky did not discuss quantifiers but only articles, and gave phrase structure rules which rewrote "Det" as "±def" with an optional NP. Chomsky's "±def" must be interpreted as a "double filling" of the determiner position rather than as a feature of the NP, since it is independent of the definiteness of that NP, and since it is left behind when the NP is moved, whereas movement transformations otherwise never leave behind an "indefinite" trace of what is moved).

     My only guess as to why Chomsky and Emonds prefer the "verb second" alternative and its concomitant weakening of syntactic theory so as to countenance "doubly filled positions" is that, given their assumed parallelism between S and NP, they would otherwise require deep structure configurations such as [V NP NP NP]$_S$ which do not occur in surface structure.

     [8] Hasegawa uses the word "judgment" loosely; for example, he speaks of the complement of *want* as a "judgment". "Assertor" is an unfortunate term, since it is applicable even in sentences in which nothing is asserted; "supplier" or "source" would have been a better choice.

analyses he gives in which comparative clauses and relative clauses have assertors other than "speaker". I conjecture that this is the result of an error in his formulation of rule (B). The following appears to represent his intentions better than does (10):

$$(11) \quad \text{A. } a(S) = \begin{cases} \text{the speaker} \\ NP' \ / \ \#NP' \begin{bmatrix} +\text{verb} \\ -\text{factive} \end{bmatrix} \end{cases}$$

  B. If $a(S_j) = B$ and S_j dominates S_i, then optionally $a(S_i) = B$.

Expressed verbally, these rules state that (a) the complement of a transitive nonfactive verb has the subject of that verb for its assertor; (b) any other clause has "speaker" for its assertor; except that optionally (c) a clause may have for its assertor the assertor of any higher clause.[9] Hasegawa's rule for d is (Hasegawa 1972, 148):

  (12)   If $a(S) = A$ (or B), then $d(NP_i) = A$ (or B), where NP_i is dominated by S.

Hasegawa means this to be interpreted so that the designator of an NP can be any possible assertor of an S containing it (and not, as the notation might suggest, the assertor of an S containing it).[10] Hasegawa states that (13) is four ways ambiguous,

  (13)   John believes that Tom loves Mary.

with the choice of whether the designator of *Tom* is "speaker" or *John* being independent of whether that of *Mary* is "speaker" or *John*. His rules appear to imply that there is an independent choice of whether the assertor of *Tom loves Mary* is "speaker" or *John*, thus making (13) eight ways ambiguous.

3.2. As far as I can determine, the only reason why Hasegawa has a as well as d is that comparative clauses, which for him do not have a deep structure involving an NP such as "the extent to which S" (as in an unpublished proposal by G. Lakoff, circa 1964, which is referred to obliquely in Ross and Perlmutter (1970) and per-

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[9] Hasegawa's point of view would appear to dictate a more general formulation of (10) than he has given. As he stated it, the inhibition of clause (i) would not apply to the complement of factive adjectives or nouns (assuming that by "+verb" he means verb as opposed to the other traditional parts of speech) or to the complement of an intransitive factive predicate (e.g. *unfortunate, a shame*) or to the subject complement of a transitive factive predicate (e.g. *bother*).

[10] Hasegawa does not indicate how he would modify (12) to accommodate the fact that the "designator" of *a lion* in *John is looking for a lion* can be *John* (his rules as they stand yield only "speaker" as the designator of *a lion*). I conjecture, on the basis of his evident aversion to extra S nodes in deep structure, that he would change his rules to allow the objects of certain designated verbs (e.g. *look for, ask for, imagine*) to have the subject of that verb as "designator" (see Jackendoff 1971 for a proposal of this type); this example, incidentally, makes clear that Hasegawa should have made "designator" more basic than "assertor" rather than vice versa: it is the possibility of an "irregular" designator for the object NP of *John is looking for an elephant that has two heads* that makes it possible for the relative clause to have an "irregular" assertor. In generative semantic studies of *look for* (e.g. Bach 1968; see J. McCawley (to appear b) for discussion of some supposed counterexamples to Bach's analysis that Dougherty has offered), by contrast, there is no "irregularity": the verbs which allow a "non-referring" NP are those which demand a semantic structure in which that NP is in the complement of a "world-creating" verb such as *try* or *think*.

pendicularly in R. Lakoff (1970)), can be ambiguous as to whether their content is supplied by the speaker or attributed to someone else; recall the celebrated example

(14) John thinks he is taller than he is.

For all other embedded sentences, Hasegawa's rules predict ambiguities that do not exist. For example, his rules incorrectly predict that the assertor of *who lives at 219 Main Street* in (3) ("speaker" or *John*) can differ from the designator of *the woman who lives at 219 Main Street*, and that (3) is thus four ways ambiguous. The one fact cited by Hasegawa that might be taken as implying that (3) has such interpretations really shows nothing of the kind. Specifically, he points out that (15) might be based on the speaker's having heard John say (16)

(15) John thinks that Bill loves the girl who married Tom.
(16) Bill loves the girl who you met here yesterday.

where the speaker knows that the girl who he met there on that day is the girl who married Tom. Hasegawa cites (15)–(16) in the course of cataloguing various supposed absurd consequences of the assumptions of J. McCawley (1970a) and Ross and Perlmutter (1970), in this case the conclusion that the relative clause can originate "externally". Hasegawa does not make clear why he thinks that our assumptions would require just the relative clause (and not the whole NP) to originate externally.[11] I conjecture that he says this because he attaches importance to the fact that the relative clauses in (15) and (16) modify the same head noun, *girl*. That fact, however, is totally without significance. If I provide a description of someone in reporting what John has said about that person, I cannot attribute the head noun of my description to John. Consider, for example, cases where John's judgments and mine differ. If John is under the mistaken belief that a certain woman is a male transvestite and I know that the person in question is really Charley's sister, I cannot report his statement (17) by saying (18):

(17) The transvestite who lives upstairs knows a lot about baseball.
(18) ?John told me that the transvestite who is Charley's sister knows a lot about baseball.

[11] Hasegawa's claim that my premises require restrictive relatives to have an "external origin" is the first of a remarkable sequence of nonsequiturs. He proceeds to make the error (fn. 9) of identifying that (as yet unproposed) hypothesis with the hypothesis that restrictive relatives are derived from conjoined structures (see Thompson 1971 for one version of that proposal) and then goes on to argue against that proposal on the basis of an example which in fact provides no argument against it. While Hasegawa is correct that "*I lost the only book he had* . . . cannot be derived from *He had the only book and I lost it* or something similar", that fact shows only that the "relative from conjunct" proposal is inconsistent with the hypothesis that *only* originates in its surface position. It does not raise any problems for an analysis of *only* as "no other than . . .", e.g. deriving *I lost the only book he had* from the semantic structure "Exists$_x$ (Book x and he had x and All$_y$ (Book y and not ($y = x$) $\supset$ not (he had x)) and I lost x)." Similarly, Bresnan's (1971) observation that *I am looking for a woman who speaks Mundari* cannot be derived (in the nonreferring sense) from *I am looking for a woman and the woman speaks Mundari* only shows that accepting the "relative from conjunct" proposal requires one to also accept an analysis of *look for* in which the object originates in a subordinate clause, as in Bach (1968).

If Hasegawa's SIRs for *d* and *a* and his claims about (15)–(16) were correct, then (18) would be an acceptable report of (17).

In addition, Hasegawa's rules incorrectly predict that complement Ss can be ambiguous as to who their assertor is. Since I at one time maintained that such ambiguities are possible, it is worthwhile for me to digress here into my reasons for rejecting my earlier conclusion. In the original version of J. McCawley (1970a),[12] I noted that (19) may be uttered as a report of John's having said (20)

(19)   John admits that Arthur was right.
(20)   I admit that Mohammed Ali is the greatest living American.

and concluded that *admit* may have an index as its object in semantic representation and that *that Arthur was right* may constitute the speaker's description of what John admits and thus (as in the case of (2)) originate outside the complement of *admit*. However, I was grossly mistaken in concluding that (19) is at all parallel to (3). Someone who knows that the person that John was referring to is the woman who lives at 219 Main Street may utter (3) regardless of what John knows or believes about that person. However, one may utter (19) as a report of (20) only if John knows who Arthur is and knows that Arthur has claimed whatever it is that John admitted to be the case. For example, it would be absurd to say (21)

(21)   ?Kepler admitted that Einstein was/is right.

in reporting an admission by Kepler that all motion must be at less than the speed of light. In (19), *that Arthur was right* is thus no more or less the speaker's description of what John said than it is if (19) is used to report John's having said any of the following:

(22) a.   I admit that Arthur was right.
     b.   I have finally come to realize that Mohammed Ali is as great a man as his admirers have claimed that he is.
     c.   It's clear to me now that I was dead wrong when I disagreed with Arthur the other night.
     d.   I've changed my mind about Tim Leary; now I think he's a schmuck.

The report is correct if and only if John, in saying whatever he said, intended to acknowledge that Arthur was right; given that John said what he said with that purpose, it is immaterial what words he used. (19) is unspecified rather than ambiguous as to what John allegedly said: (23) is appropriate even in a case where it reports John's saying (22a) and Frank's saying (22d).

(23)   Yesterday John admitted that Arthur was right, and so did Frank.

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[12] I deleted the passage in question from the version of that paper which appeared in Steinberg and Jakobovits (1971).

On the other hand, (3) is ambiguous as to the role of *the woman who lives at 219 Main Street*; to take a somewhat clearer example than (3), consider (24):

(24) John denied that he kissed the girl who he kissed, and so did Bill.

(24) is appropriate (i) to say of a certain girl that John said he did not kiss her and Bill also said he did not kiss her, or (ii) to accuse both John and Bill of lying (i.e. of making false statements of the form "I did not kiss *x*"), or (iii) to attribute to each of them a self-contradictory assertion (whose content could be expressed by "I didn't kiss the girl who I kissed"), but it cannot be used e.g. to report that one of them denied having kissed a certain girl and to attribute a self-contradictory assertion to the other.[13] I would maintain indeed that there are no examples of what I claimed (19) to be in J. McCawley (1970a), i.e. examples where my mode of semantic representation would demand that complements be external to the clause they are ultimately to appear in and be substituted for corresponding indices in the course of the derivation.[14]

3.3. The claim that there are no such examples has been incorporated into linguistic theory by G. Lakoff (1968) under the slogan "complements in, modifiers out" (CIMO). Specifically, Lakoff proposed that a sentence does not have a referential index, that each NP position in semantic structure is filled by a sentence or a (constant or variable) referential index or an expression that denotes a set (of "entities" or propositions), and that the noun, relative clause(s), quantifier, etc. comprising a surface NP originate outside the clause in question. Lakoff has noted that CIMO is supported by the impossibility of forming Bach-Peters sentences based on sentence pronominalization or on "VP Deletion":

(25) a. *Everyone who thinks *that Bill said it* has claimed **that Max denied it**.
      b. *That Bill *persuaded Shirley to ϕ* implies that Mary **forced Sam to ϕ**.

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[13] Hasegawa discusses briefly (fn. 17) the three-way ambiguity of (24), which I had previously claimed (J. McCawley, to appear) constitutes a major problem for the analysis of Hasegawa (1970) but follows naturally from mine. I would now retract the word "major"; Hasegawa is able to describe the ambiguity of (24) within his system, though at the expense of a fairly complicated treatment of "identity". Hasegawa proposes assigning to interpretation (i) a deep structure having *that he kissed her* in the second conjunct and to (ii) and (iii) one having *that he kissed the girl who he kissed*; he treats the difference between (ii) and (iii) as residing in whether "speaker" or *John* (respectively) is the assertor of *who he kissed*. Hasegawa does not make clear how the identity condition on VP Deletion (which he misleadingly refers to as "Do So") would have to be understood, but he evidently intends that (a) differences between coreferential NPs (such as *her* and *the girl who he kissed* in (i)) be ignored if the one in the item to be deleted is a pronoun, and (b) items count as identical only if either they have the same assertor/designator (as in (ii)) or the assertors/designators are in "parallel" positions (as in (iii)).

[14] I do not exclude the possibility that a clause may become the complement of something in the course of a derivation. For example, I am inclined to agree with Sadock's conjecture that the surface complement of *regret* in (i)

(i) I regret to inform you that your parakeet is dead.

is not its complement in semantic structure but is rather the main clause of a coordinate structure; see also N. McCawley (1972a, b) for arguments that the surface complement of *happy*, etc. (and corresponding Japanese verbs) in *John is happy that you got the job* is not its complement in semantic structure. Both of these proposals are consistent with the "complements in, modifiers out" proposal.

(the intended pronoun-antecedent relations are indicated by italicization and bold-face). Since (as noted by Bach (1970)) Bach-Peters sentences require an infinitely deep deep structure if their pronouns are derived from copies of their antecedents, and since CIMO requires that sentence pronouns be derived from copies of their ante-cedents but does not require that "ordinary" pronouns be, CIMO implies that sentences such as (25) would require an infinitely deep deep structure (and hence would have no derivation) but leaves open the possibility for a derivation of Bach-Peters sentences that are based on ordinary pronouns (as in (4)).

3.4. When supplemented with an analysis of the semantic structure of comparatives along the lines of "the extent to which S_1 exceeds the extent to which S_2" (as proposed by G. Lakoff), in which the two "the extent to which S_i" constituents are non-sentential NPs and thus have an external source, CIMO appears to predict correctly what range of ambiguities of the types discussed by Hasegawa in TSI actually occur. As far as I can see, Hasegawa's approach could be made to account for the lack of the supposed ambiguities treated above only if it were fairly drastically revised, specifically, if *a* were eliminated entirely and a treatment of comparatives such as Lakoff's were adopted. There remains, however, an important class of cases in which there is an ambiguity which can be expressed fairly naturally in terms of external NPs but which Hasegawa's annotations are in principle incapable of describing. Hasegawa draws the distinction between the two interpretations of (3) by associating with the relevant NP different "designators": in one interpretation, "speaker", and in the other, the subject of a verb that commands that NP. Hasegawa's treatment thus predicts that if there is no such commanding subject, there can be no such ambiguity, e.g. the designator of *the king of France* in (26) could only be "speaker".

(26)   It is unlikely that Bill talked to the king of France.

However, (26) appears to me to have exactly the same kind of ambiguity that (3) has; in one sense of (26), the speaker is referring to the king of France and saying that it is unlikely that Bill talked to him (this interpretation involves a presupposition that there is a king of France), and in the other sense, the speaker is calling unlikely the proposition that Bill talked to the king of France.

It should also be pointed out that in an obscure footnote in TSI, Hasegawa accepts something that is awfully close to a semantic represension with external NPs: "In cases like this, the domain of $a(S_2)$ will be understood to be the whole S_2 minus S_1. In other words, $a(S_2)$ refers to the assertor of S_2 with the portion preempted by $a(S_1)$ replaced by X" (Hasegawa 1972, 149, fn. 16). The example which Hasegawa is discussing at this point is (27):

(27)   John thinks Mary is taller than she is.

His proposed deep structure is (28)

(28)   [John thinks [Mary is more [than she is Δ tall]$_{S_1}$ tall]$_{S_2}$]$_{S_3}$

where Δ is "an unspecified degree adverbial". According to the footnote just quoted, in the "normal" interpretation of (27) (that which asserts that the height John thinks Mary has exceeds the height which she really has), *John* is the assertor not of *Mary is taller than she is* but of *Mary is more X tall* (= *Mary is (more than X) tall?*). Thus, if one applies to Hasegawa's semantic representation his directions as to how to interpret a semantic representation, the result agrees with Lakoff's deep structure for comparatives in the very respect which Hasegawa had found objectionable: the content of the *than*-clause is external to the comparative construction per se.

Which is more deserving of the title "semantic representation": the annotated deep structures that Hasegawa discusses in the bulk of TSI or the structures that result from them by detaching certain pieces, in accordance with his footnote 16 (and perhaps other principles of that ilk)? If "semantic representation" is to serve as the interface between grammar and logic, then the latter kind of structures comes closer to filling the bill than do Hasegawa's annotated deep structures. *Mary is taller than she is* is not a "logical constituent" of the "normal" interpretation of (27), in the sense that inferences requiring such a constituent are not valid. For example, the inference (29)

(29)   John thinks Mary is taller than she is.
        Everything that John thinks is recorded in the *Tribune*.
        Therefore, it is recorded in the *Tribune* that Mary is taller than she is.

is invalid if the first premise is interpreted in the "normal" way (i.e. as meaning that the height John thinks Mary is exceeds the height that she really is) and the conclusion is interpreted as meaning that it is recorded in the *Tribune* that Mary's height exceeds her height. It is valid only if both conclusion and premise involve the semantic constituent "Mary's height exceeds X" or if both of them involve the semantic constituent "Mary's height exceeds her height"; that constituent plays the role of m in the rule of inference "$f(m)$; $g(x)$ for all x such that $f(x)$; therefore, $g(m)$". The CIMO proposal appears to provide the constituents which play a role in (valid) rules of inference; Hasegawa's annotated deep structures, without the modification alluded to in his footnote 16, appear to fail this criterion of adequacy.

4. This section is concerned with some general constraints on transformations which Hasegawa discusses in TSI, principally in the appendix.

4.1. One of several reasons which Hasegawa gives for being suspicious of the performative analysis of Ross (1970) is that it "violates the recoverability condition on deletion" (Hasegawa 1972, 146). There is so little written about that often-mentioned principle that it is not at all clear to me why its adherents adhere to it. According to my hazy recollections of its early days, it was introduced principally in order to rule out "crazy derivations" such as a derivation of *John was murdered* which involves deletion of *by seven dope-crazed thugs acting on the orders of the former deputy director of*

SMERSH. In a theory whose goal is merely "to generate all and only the sentences of the language", something such as a prohibition against "irrecoverable deletions" is needed to exclude such analyses. However, in a theory whose goal is to correctly pair surface structures with semantic structures and contexts [15] and which has adequate tests for ambiguity, crazy derivations such as the one just suggested can be excluded independently of any prohibition on "irrecoverable deletions". For example, *John was murdered* can easily be shown not to be ambiguous as to what the underlying subject of *murder* is; specifically, (30) is appropriate regardless of whether the two murderers are supposed to be identical.

(30)   John was murdered, and so was Mike.

I thus see no reason why a "recoverability condition on deletion" would be needed within generative semantics. In addition, it is far from clear what deletions should count as "recoverable". The most common answer to that question is that only deletions of a constant and deletions under identity should be regarded as "recoverable". However, there are clear examples of deletions which do not fit into either of those types; for example, Cantrall (1969) has noted that in (31)

(31) a.   A wife shouldn't criticize.
     b.   Parents have an obligation to spank.

the deleted elements (*her husband* and *their children*) neither are constants nor are deleted under identity, though they are clearly "recoverable" in an informal sense.

4.2. Hasegawa proposes two general constraints on transformations that are not widely accepted. One is that ". . . the term affected must not be a lexical constant, where a lexical constant means a specific lexical item (or a sequence of them) with intrinsic semantic content" (Hasegawa 1972, 157). He interprets "lexical item" in a sense which excludes "grammatical formatives" such as *for* and *to*, which clearly can be the sole "term affected" in a deletion rule. It is not clear whether this constraint would be violated by Ross's performative deletion rule, since Ross has not made clear enough what it is that the rule deletes. However, there are enough clear cases of well-motivated rules that violate the constraint (see Postal (1969), Borkin (1972)) that it is doubtful that it can be maintained; I have in mind such rules as Postal's T_{meat} and "Euphemistic Genital Deletion", which delete the items *meat* and *penis* in such sentences as (32)–(33):

(32)   Arabs eat a lot of lamb.
(33)   Sam is too small to satisfy Maxine.

[15] In this paper I have neglected the basic role of contexts in generative semantics. See R. Lakoff (to appear) and G. Lakoff (1971) for discussion of extralinguistic context in relation to grammar and Morgan (in press) for discussion of linguistic context.

The other constraint proposed by Hasegawa strikes me as much more plausible. This is the restriction that any transformation can perform only one operation, where there is a preassigned inventory of allowable operations. Hasegawa points out that several transformations proposed by generative semanticists grossly violate this restriction. For example, Ross's performative deletion transformation deletes the performative verb plus its subject and indirect object, which do not comprise a constituent and thus would be three separate terms of the structural description, given Hasegawa's inventory of allowable operations: "(i) deletion of one term of the structural index, (ii) substitution of one term of the structural index for another, and (iii) adjunction of one term of the structural index (or a new [semantically?: JDM] empty formative) to another" (Hasegawa 1972, 156). I would maintain, however, following Ross (1969) and earlier unpublished work by G. Lakoff, that a fourth elementary operation must be admitted, namely relative deletion, i.e. deletion of all of a constituent except for some particular constituent contained in it. Performative deletion would then be an instance of this fourth elementary operation: deletion of the main clause except for the complement of the main verb. The other example Hasegawa cites of a transformation which grossly violates his elementariness constraint is a rule proposed by Postal (1971, 235), which derives contrastively stressed sentences from cleft sentences by deleting three terms and moving a fourth one. I think that the rule Postal proposes is irremediably wrong and that it is an excellent choice for Hasegawa's rogues' gallery. My candidate for the most promising alternative approach to contrastive stress is that in which all contrastive stresses arise through a rule which stresses the contrasting elements (or destresses the repeated element) of "parallel clauses", as in (34)

(34)   Does John write póems in the outhouse, or does he write jókes there?

and allows one of the "parallel" clauses to be deleted under some circumstances. Such an approach is consistent with Hasegawa's "elementariness condition" though not with the "recoverability condition on deletions".

5. Finally, I would like to comment briefly on what Hasegawa presents as "the basic tenet" of generative semantics in section 1 of TSI: "Every difference in meaning (semantic representation) reflects a difference in deep structure (i.e. the deepest level of representation). In other words it is assumed [by generative semanticists: JDM] that for every aspect of meaning there exists an explicit counterpart in deep structure that putatively accounts for that aspect of meaning" (Hasegawa 1972, 142). There are a number of subtle but important respects in which this statement misrepresents generative semantics.

(i) Hasegawa's reference to differences in meaning "reflecting" differences in deep structure (NB: not the other way round) involves attributing to generative semanticists a notion of "deep structure" which is conceptually (though not necessarily

extensionally) distinct from "semantic structure" and whose existence is taken for granted. Hasegawa thus treats only the position that "deep structure is semantic structure" (taken in some early generative semantic works such as Bach 1968, which was written in early 1967) and ignores the position that "whether there is a level of deep structure at all is an empirical issue" (taken in most generative semantic works, even one as early as J. McCawley 1970a, which was written in summer 1967). Those generative semantic works which took the position that "deep structure is semantic structure" accepted the goal of Chomsky's *Aspects* (to provide a system of rules that generates all and only the sentences of the language in question) and the notion of "grammatical" which the notion "sentence of language L" assumes. More recent work by generative semanticists (e.g. G. Lakoff 1971, J. McCawley 1972b) argues that that notion of grammaticality is (depending on how one interprets it) either incoherent or irrelevant to linguistic competence, and that the only linguistically significant notion of well-formedness is well-formedness of a sentence relative to a meaning that it is supposed to express and a linguistic and/or extralinguistic context.

(ii) "Every aspect of meaning" is so vague an expression that it does not make at all clear what things generative semanticists allegedly require to have "explicit counterparts in deep structure". If contradictoriness is an "aspect of meaning", then Hasegawa's statement is false: generative semanticists do not require the "deep structure" of a contradictory sentence to (in effect) bear a sign saying "I'm self-contradictory". More importantly, there are pieces of extralinguistic context which play a role in derivations and might be considered by many to be "aspects of meaning" but which, at least in the work of G. Lakoff (I have not taken a firm position on this issue), are not treated as having a "counterpart in deep structure", e.g. the belief that it is undesirable to be thought of as a Republican, which one must hold if he is to utter felicitously Lakoff's example *John called Mary a Republican, and then shé insulted hím.* To take a more down-to-earth example, generative semanticists can perfectly well take the sentences of (35)

(35) a.   My neighbor hates himself.
     b.   My neighbor hates herself.

as having the same semantic representation and differing only in the context in which they are appropriate, i.e. that (35b) can only be used appropriately by someone who believes the neighbor to be a woman; such a treatment of (35) is ably defended in Dahl (ms).

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