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# Deriving and Copying Predication

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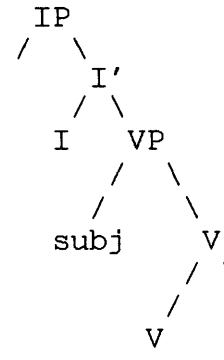
## [1] Introduction:

Kitagawa (1986) proposed and argued for the so-called "Internal Subject Analysis". (See also Fukui (1986), Kuroda (to appear) and Sportiche (1988), etc.) As illustrated in (1) below, one of the major claims of the Internal Subject Analysis is that the subject of a sentence in English is base-generated under VP and undergoes movement in syntax, leaving a trace behind, due to the application of Move-α in syntax:[1]

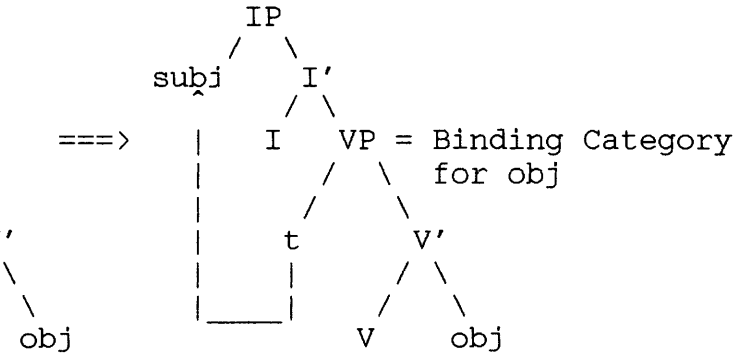
(1) Internal Subject Analysis of English:

a. D-str:




===>

b. S-str/LF:



It was also pointed out that the Principles A and B of the Binding Theory should be revised in such a way that, in diagram (1b), the VP rather than the IP is identified as the Binding Category for anaphors and pronominals in the object position. The subject trace internal to the VP, in other words, acts as a possible antecedent for the object anaphors and pronominals. In this paper, I will adopt this specific version of the Internal Subject Analysis and explore some of its syntactic and semantic implications.

In the first half of the paper, I will attempt to show that various problems involved in the phenomena of VP-Ellipsis can be solved without recourse to the Derived VP Rule applying in syntax (Williams (1977)), if we hypothesize: (i) that all A-binding involves free coindexation at LF, and (ii) that the principles A and B of the Binding Theory must hold at LF (Chomsky (1986)). Furthermore, I will attempt to demonstrate that most, if not all, of what the Derived VP Rule is intended to achieve in the account of VP-Ellipsis will be an automatic consequence of the Internal Subject Analysis.

In the latter half of the paper, I will attempt to incorporate Lewis' (1979) analyses of "objects of attitudes" into the framework of the Government & Binding Theory, and propose some specific semantic interpretation rules that map LF-representations onto logical forms. I will, then, argue that the Rule of Predication (Williams (1980)) can be subsumed under the proposed semantic rules when we adopt the Internal Subject Analysis.

Throughout the paper, I will make a crucial appeal to the following theoretical observations. As illustrated in (2a) and (2b), Move-$\alpha$ applying in the Internal Subject Analysis turns the base-generated VP into a one-place predicate which contains a non-constant to be bound by the external argument of the predicate. This non-constant, in turn, comes to be bound by its antecedent, as illustrated in (2c):

(2) a. D-str: $[_{IP}$ INFL $[_{VP}$ *John* loves cats $]]$

b. ... $[_{IP}$ *John* INFL $[_{VP}$ *t* loves cats $]]$

c. LF: $[_{IP}$ John$_1$ INFL $[_{VP}$ t$_1$ loves cats $]]$

As illustrated by the simplified representations in (3b) and (3d), this is quite similar to what is achieved by $\lambda$-abstraction and $\lambda$-conversion:

(3) a. Syntactic Rep 1: [VP loves cats ]

b. Semantic Rep 1: λx [x loves cats]

c. Syntactic Rep 2: [S John loves cats ]

d. Semantic Rep 2: λx [x loves cats] (John)

Futhermore, the derived VP in (2b) contains not a variable but an NP-trace, or in more general terms, an empty anaphor, which lacks capacity for inherent reference, hence seeks its antecedent. Presumably due to such an anaphoric property of the VP-internal subject, the derived VP comes to have "property" as its sense. This result, again, is quite similar, if not identical, to that achieved by the λ-operator. What I would like to point out in this paper, in other words, is that the application of Move-α followed by coindexation in the Internal Subject Analysis can be regarded, in a sense, as the syntactic analogue of the semantic operation of λ-abstraction and λ-conversion, or at least as providing the syntactic basis for such semantic operations.

**[2] VP Ellipsis:**

First, we will adopt a version of the Interpretive Approach to VP-Ellipsis (cf. Wasow (1974) and Williams (1977)), and assume that a base-generated empty VP is replaced by the copy of the antecedent VP by the LF rule of "VP-Copy", as illustrated in (4):[2]

(4) Interpretive Approach to VP-Ellipsis:

a. D/S/L: I [VP love cats ], and my wife does [VP e ], too.

b. L: I [VP love cats ], and my wife does [VP ***love cats*** ], too.

One of the most interesting problems observed with VP-Ellipsis is the phenomenon known as the sloppy identity of reflexive anaphors, as illustrated in (5):

(5) John blamed himself, and Bill did [VP e ], too.
= John blamed John, and Bill blamed Bill.

Williams (Ibid.) offers a solution as summarized in (6), which I will refer to as the "Derived VP Approach":

(6) Derived VP Approach:

a. D/S:

John [$_{VP}$ blamed himself ], and Bill did [$_{VP}$ e e ], too.

b. == Derived VP Rule ==>

John [$_{VP}$ **λx**(**x** blame himself)], and Bill did [$_{VP}$ e e ],too.

c. == Reflexivization ==>

John [$_{VP}$ λx(x blame **x**)], and Bill did [$_{VP}$ e e ], too.

d. == VP Rule (= VP-Copy) ==> L:

John [$_{VP}$ λx(x blame x)], and Bill did [$_{VP}$ **λx**(**x** blame **x**)], too.

In this approach, the Derived VP Rule first derives a VP containing a λ-operator and a variable bound by it ((6b)). Then, the rule of Reflexivization rewrites a reflexive anaphor into another variable bound by the same λ-operator ((6c)). Finally, the VP Rule copies this VP representing the property of "self-blaming" into the second clause, deriving an obligatory sloppy reading ((6d)).

If the variable in representation (6b) ever plays a crucial role in the account of the sloppy identity, as claimed in the Derived VP Approach, we can also provide an equally simple account of this phenomenon in our Internal Subject Analysis. Notice that the copied VP in our LF-representation (7) correctly represents the property of "self-blaming", containg the trace of the subject NP created by Move-α:

(7) LF: John [$_{VP}$ t blamed himself ], and
Bill did [VP *t* blame himself ], too.

The Internal Subject Analysis makes it unnecessary, in other words, to have recourse to a syntactic rule of Derived VP Rule in dealing with sloppy identity.

If we pursue this line of account, we are naturally led to conclude that NP-traces are not automatically coindexed with their antecedents at the time of movement, but that they are freely coindexed after VP-Copy applies at LF. Generalizing this conclusion further, we will postulate a hypothesis as in (8):

(8) Free Coindexation at LF:

All A-binding and its concomitant coindexation (including that for NP-traces) takes place at LF.

This, in fact, seems to be a desirable move to take, since, as illustrated by the indexing in (9b), VP Ellipsis in passive sentences can be handled in a much simpler way if the copied trace does not carry over its own index from the antecedent VP:

(9) a. S: John was [$_{VP}$ hit t ], and Bill was [$_{VP}$ e ], too.
b. L: John$_1$ was [$_{VP}$ hit $t_1$ ], and
***Bill***$_2$ was [$_{VP}$ hit $t_{2/*1}$ ], too.

With this claim in mind, let us further pursue the topic of sloppy identity. As illustrated by the contrast between (10) and (11), it is a well-known fact that sloppy identity is obligatory for anaphors but is optional for pronouns.

(10) Anaphors ==> Obligatory Sloppy Identity:

John blamed *himself*, and Bill did [$_{VP}$ e ], too.

= John blamed John, and Bill blamed Bill.
but
≠ John blamed John, and Bill blamed *John*.

(11) Pronominals ==> Optional Sloppy Identity:

John likes *his* son, and Bill does [$_{VP}$ e ], too.

= John likes John's son, and Bill likes *Bill's* son.
or
= John likes John's son, and Bill likes *John's* son.

In the Derived VP Approach, this contrast is captured by a stipulation that the rewriting of an anaphor into a variable, as exemplified in (6c), is obligatory, while such a rewriting is optional for pronouns.

What we would like to propose here is that this contrast follows quite straightforwardly from our claim that all anaphors and pronominals are coindexed at LF, and another not unreasonable hypothesis in (12):

(12) Binding Theory A/B at LF (cf. Chomsky (1986)):

The Principles A and B of the Binding Theory (BT(A/B)) hold at LF.

In this approach, we may assume that the coindexation for all A-binding may take place anywhere in the LF component, hence either before or after VP-Copy. In either case, however, the resulting representation is subject to BT(A/B). In the LF-representation in (13), then, himself in the second (= reconstructed) VP must be bound by the trace of the raised subject ($t_2$) within that VP to satisfy the BT(A).

(13) Anaphors ==> BT(A) ==> Obligatory Sloppy Identity:

LF: $John_1$ [$_{VP}$ t blame himself ], and

$Bill_2$ does [$_{VP}$ $t_2$ blame *himself*$_{2/*1}$ ], too.

In the LF-representation (14), on the other hand, the BT(B) allows the genitive pronominal in the second clause to be bound either by the trace of the raised subject ($t_2$) or the subject of the first clause (John):

(14) Pronominals ==> BT(B) ==> Optional Sloppy Identity:

LF: $John_1$ [$_{VP}$ t like [[$_{NP}$ his son ]], and

$Bill_2$ does [$_{VP}$ $t_2$ like [$_{NP}$ *his*$_{2/1}$ son ]], too.

We can, in other words, assimilate this peculiar contrast concerning sloppy identity to the familiar contrast between anaphors and pronominals concerning the Binding Theory, as illustrated in (15):

(15) a. Anaphor: $Bill_2$ blamed *himself*$_{2/*1}$.

b. Pronominal: $Bill_2$ likes *his*$_{2/1}$ son.

Thus, we can reduce the problem to the Binding Theory without having to stipulate anything else.

Another well-known problem in VP-Ellipsis is the restriction on the interpretation of non-sloppy pronouns observed in a sentence like (16):

(16) VP-Ellipsis:

John blamed him, and Bill did [$_{VP}$ e ], too.

= John blamed Tom, and Bill blamed *Tom*.
but
≠ John blamed Tom, and Bill blamed *Pete*.

Here, the person that Bill blamed must be the same person that John blamed. In the approach incorporating VP-Copy, on the other hand, the missing VP is reconstructed at LF as in (17). Since this resulting LF-representation contains two pronouns, and they should be able to refer independently, it would be incorrectly predicted that sentence (16) can have either interpretation indicated there.

(17) L: *John [$_{VP}$ blame him ], and Bill did [$_{VP}$ blame *him* ], too.

In the Derived VP Approach, it is claimed that this problem can be solved with a hypothesis that those pronouns which are not rewritten into variables carry their inherent indices at the level of D-structure, as in (18a) --- and, as in (18b), such indices are inherited in the LF-representation derived by VP-Copy.

(18)
a. D: John blamed him$_3$, and Bill did [$_{VP}$ e ], too.

b. L: John [$_{VP}$ blame him$_3$ ], and Bill did [$_{VP}$ blame *him*$_3$ ], too.

While this solution is quite reasonable and probably correct, a more careful examination of the problem reveals that it alone is not sufficient. Note, for example, that exactly the same restriction on the interpretation of pronouns can be observed in a sentence like (19), where no VP-Ellipsis, hence no VP-Copy is involved:

(19) No VP-Ellipsis:

D/S/L: John blamed him, and Bill blamed *him*, too.

= John blamed Tom, and Bill blamed Tom.
but
≠ John blamed Tom, and Bill blamed Pete.

In this example, therefore, we cannot make an appeal to the inheritance of indices, as suggested in the Derived VP Aproach, nor to the λ-notation itself to account for the observed restriction.

In this paper, as our first approximation, we tentatively adopt a hypothesis that there exists a type of "parallelism" constraint imposed by the presence of the adverbial too in the sentence, which can be realized as constraints on the coreference of anaphoric items. Quite informally, we can summarize this constraint as in (20):

(20) Parallelism Constraint realized in coreference requires:

a. Identical Reference ==> Strict Identity (e.g., (11),(16),(19))

or

b. Reflexiveness(/Reciprocality) ==> Sloppy Identity (e.g., (10),(11))

Obviously, this requirement can be fulfilled either by the base-generated anaphoric items or by those reconstructed at LF by the application of VP-Copy.

The example in (21) demonstrates that it indeed is the adverbial too which imposes this constraint:

(21) John blamed $him_3$, and Bill blamed $HIM_4$.
= John blamed $Tom_3$, and Bill blamed $Pete_4$.

Notice here that, if we eliminate the adverbial too, the parallelism constraint also disappears, and the two instances of him can now refer independently, as long as sufficient context or stress is provided to make clear that they are intended to refer to two distinct people.

Coming back now to the main stream of the discussion, we can probably revise the Derived VP Approach, incorporating the Parallelism Constraint (20) into the grammar to account for the restriction observed in the base-generated case (19).

Still unaccounted for in this approach, however, is why sentence (22a) cannot be interpreted as in (22b):

(22) Accidental Coindexation:

a. John blamed him, and Bill did [$_{VP}$ e ], too.
b. ≠ John blamed Bill, and Bill blamed *Bill*.
c. L:*$John_1$ [$_{VP}$ blame *$him_2$* ], and *$Bill_2$* did [$_{VP}$ blame $him_2$ ], too.

This illicit interpretation arises, as illustrated in the LF-reprentation (22c), when the pronon him in the first

clause is accidentally coindexed with the subject of the second clause Bill, and copied into the second clause. Notice that (22c) should be permitted in the Derived VP Approach. The parallelism constraint is satisfied, since the pronoun him carries an identical index in both clauses. Moreover, the index of the pronoun in the first clause is inherited in the second clause, as required in this approach. In short, the Derived VP Approach does not seem to offer any satisfactory account for this problem.

In the approach we have proposed, on the other hand, we can prevent the accidental coindexation in (22c), making an appeal to BT(B) applying to the output of VP-Copy. Note that BT(B) is violated in the LF-representation (23) below, since the pronominal him in the second clause is bound by the trace of the raised subject within the VP, its Binding Category:

(23) L: John blamed him, and $Bill_2$ [$_{VP}$ $t_2$ blame *him*$_{*2}$ ], too

We can, in other words, assimilate the problem in (22) to a more familiar problem of disjoint reference observed in (24):

(24) **Bill*$_2$ blamed *him*$_2$.

In our approach, we also make a prediction that the contrast between (24) and (25) will be carried over to the binding relation resulting from the VP-Copy:

(25) *Bill*$_2$ scolded [$_{NP}$ *his*$_2$ son ]

As illustrated by the contrast between (22a-b) and (26), this prediction is borne out:

(26) John scolded his son even before Bill did [$_{VP}$ e ].
= John scolded John's/Bill's son even before Bill scolded *Bill's* son.

In our discussion, we have adopted the hypothesis that all A-binding may take place anywhere at LF, in particular, even after VP-Copy applies. In the Derived VP Approach, on the other hand, an argument has been offered against such a hypothesis. The argument goes as follows. The sentence like (27) is ambiguous, as indicated by the indexing there:

(27) $John_1$ told $Bill_2$ about himself$_{1/2}$.

Suppose now that this sentence appears in a VP-Ellipsis construction as in (28), and VP-Copy applies at LF, as in (29):

(28) John told Bill about himself, and Sam did [$_{VP}$ e ], too.

(29) LF: John [$_{VP}$ told Bill about himself ], and Sam did [VP tell Bill about himself ], too.

If, as proposed in our approach, the anaphors here can be coindexed independently in each clause after VP-Copy applies, (28) should yield four different LF-representations, as indicated in (30):

(30) a. John$_1$ [ told Bill$_2$ about himself$_1$ ], and Sam$_3$ did [ tell Bill$_2$ about himself$_3$ ], too.

b. John$_1$ [ told Bill$_2$ about himself$_2$ ], and Sam$_3$ did [ tell Bill$_2$ about himself$_2$ ], too.

c. John$_1$ [ told Bill$_2$ about himself$_1$ ], and Sam$_3$ did [ tell Bill$_2$ about himself$_2$ ], too.

d. John$_1$ [ told Bill$_2$ about himself$_2$ ], and Sam$_3$ did [ tell Bill$_2$ about himself$_3$ ], too.

In reality, however, the sentence in (28) is only two ways ambiguous between the readings in (30a) and (30b): as in (30a), if John told Bill about John, then Sam told Bill about Sam, and, as in (30b), if John told Bill about Bill, then Sam told Bill about Bill. Coindexation after VP-Copy, thus, is claimed to make a prediction that the incorrect combinations in (30c) and (30d) would also be possible.

Notice, however, that exactly the same reduction of ambiguity takes place in a sentence like (31) as well, where no VP-Ellipsis is involved:

(31) D/S/L: John told Bill about himself, and Sam told Bill about himself, too.

= John told Bill about John, and Sam told Bill about Sam.
or
= John told Bill about Bill, and Sam told Bill about Bill
but
≠ John told Bill about John, and Sam told Bill about Bill
or
≠ John told Bill about Bill, and Sam told Bill about Sam.

We, thus, can consider that VP-Ellipsis, in fact, allows four-way ambiguity in sentence (28), and both in (28) and (31), the reduction of the ambiguity is induced by some other independent factor. This conclusion alone, I believe, will suffice for dismissing the counterargument to our approach. For the sake of the completeness of the argument, however, let us speculate on the identity of this independent factor, and suggest that it is the already familiar parallelism constraint on coreference with a slight revision as summarized in (32):

(32) Parallelism Constraint realized in coreference requires:

a. Identical Reference
or
b. Reflexiveness/Reciprocality & the Identical Grammatical Function of the Antecedent[3]

This hypothesis receives its initial motivation when we observe that such parallelism is not required in sentence (31), when the adverbial too is eliminated, as in (33). Note that, although the sentence is a little unnatural, the indicated coindexation is clearly possible:

(33) $John_1$ told $Bill_2$ about $himself_1$, and/but $Sam_3$ told $Bill_2$ about $himself_2$.

Thus, it seems possible for us to retain our hypothesis that all A-binding including that for NP-traces takes place at LF. With example (34a), however, Williams (1977) points out that Wh-traces must be automatically coindexed with its antecedent at the time of movement:

(34)
a. D: *John, who Bill saw, and who Bob did [$_{VP}$ e ], too.

b. L: $John_1$, $who_1$ Bill [$_{VP}$ see $t_1$ ], and $who_2$ Bob did [$_{VP}$ see $t_{*1}$ ], too.

Note that (34a) can be correctly ruled out if, in the LF-representation (34b), the Wh-trace copied from the antecedent clause already carries an index, and ends up being located within the scope of a Wh-phrase with a distinct index.

If this argument is valid, we must say that syntactic movement involves automatic coindexation only when the landing site is an A-bar position, but not when it is an A-position. At first sight, this dichotomy appears to be an

undesirable consequence. When we take (35) into consideration, however, it turns out to be a result we should predict:

| (35) | Overt | Empty | Inherently referential |
|---|---|---|---|
| R-expression: | Name | Variable | Yes |
| Anaphor: | Reflexive/ Reciprocal | NP-trace | No |
| Pronominal: | Pronoun | pro | Yes/No |

It is one of the central hypotheses in the Government and Binding Theory that there exists a certain parallelism between overt and empty noun phrases. Among the possible types of NPs, names are characterized as potentially referential items, whereas anaphors are characterized as lacking capacity for inherent reference. In case of overt NPs, this distinction can be expressed in terms of the presence of an inherent referential index on names and its absence on anaphors at the relevant level, presumably at LF. Note that this parallelism breaks down in case of empty NPs if the coindexation of traces is automatic in all instances of syntactic movement. If the coindexation is concomitant with Wh-movement but not with NP-movement, on the other hand, we can extend the contrast between R-expressions and anaphors from overt items to empty categories, and retain the parallelism in LF.[4]

To sum up the first half of the paper, we have proposed and argued that various problems involved in VP-Ellipsis can be rather straightforwardly solved without recourse to the syntactic rule of Derived VP Rule when we hypothesize: (i) that the coindexation involved in all A-binding takes place at LF, and (ii) that the Principles A and B of the Binding Theory hold at LF.

## [2] Predication:

Let us now go into the second half of the paper, and examine some of the semantic implications of the Internal Subject Analysis.

With the assumptions in (36), Lewis (1979) makes a claim as in (37):

(36) a. "Proposition" is a set of possible worlds (of which this world of ours is one).

b. For any proposition, there exists a corresponding property of inhabiting some world where that proposition holds.

(37) Any propositional attitude (attitude de dicto) can be reduced to a property (attitude de se).

With the assumption (38), Lewis also makes a claim in (39):

(38) Each subject of attitude (= attitude-holder) inhabits only one world. (His counterparts may exist in other worlds, but he himself is not there.)

(39) Some attitudes are irreducibly de se, involving the attitude-holder's self-location in the subpopulation or a particular instance of ordinary time and/or space within the very world he is in. Hence the de se subsumes the de dicto, but not vice versa.

Thus, in (40), John has a desire about himself that he inhabits one of the worlds where Mary is happy, which is desire de dicto reduced to desire de se. In (41a) and (41b), on the other hand, John has desire to place himself in the subpopulation of the very world he is in, which is desire irreducibly de se:

(40) John wants Mary to be happy.

(41) a. John wants himself to be happy.
b. John wants to be happy.

Assuming that a unified analysis of propositional attitudes as properties is basically correct, and is a step forward, let us adopt the above claims by Lewis into the framework of the Government and Binding Theory. Then, with the standard analysis of the sentences in (40) and (41) in this framework as in (42) and (43), we cannot help noticing a crucial role played by the notion "syntactic binding" in distinguishing the semantics of these two sentences:

(42) $\text{John}_1$ wants [ $\text{Mary}_2$ to be happy ]

(43) a. $\text{John}_1$ wants [ $\text{himself}_1$ to be happy ]
b. $\text{John}_1$ wants [ $\text{PRO}_1$ to be happy ]

That is, in (42), no binding relation holds between the attitude-holder and the subject of the embedded clause. In both (43a) and (43b), on the other hand, the attitude-holder binds the embedded subject. Based upon this observation, let us hypothesize that the presence of syntactic binding as in (43) is at least the sufficient condition for deriving an irreducibly de se interpretation. It is the presence of syntactic binding (more precisely A-binding) at LF, in other words, that confines the relation

between the attitude-holder and the content of the attitude to a single world.[5] Based upon this hypothesis, we will also propose what we will call the Property Assignment Rules, as informally described in (44):

(44) Property Assignment Rules:

a. L: $[_{IP}$ NP ... IP ] ==========> NP = attitude-holder
IP = attitude de dicto

b. L: $[_{IP}$ $NP_1$ ... $[_{IP}$ $NP_1$ ... ]] ==> NP = attitude-holder
IP = attitude
irreducibly de se

Roughly, rule (44a) maps an LF representation onto the logical form corresponding to the de dicto interpretation, whenever there exists an NP that c-commands an IP. Rule (44b), on the other hand, maps an LF-representation onto the logical form corresponding to the irreducibly de se interpretation, if syntactic binding is observed between the c-commanding NP and another NP inside the c-commanded IP.

One obvious problem we must face with these rules is that the sentences as in (43) may be ambiguously analyzed to have structures (44a) and (44b). They would, therefore, be incorrectly assigned not only the irreducibly de se interpretation by (44b) but also the de dicto interpretation by (44a). This problem, however, does not arise if we assume that the Elsewhere Condition as in (45) proposed by Kiparsky (1982) is operative not only in the lexicon but also in other components of the grammar:

(45) Elsewhere Condition:

Rules A, B in the same component apply disjunctively to a form $\phi$ if and only if:

(i) The structural desription of A (the special rule) properly includes the structural description of B (the general rule).

(ii) The result of applying A to $\phi$ is distinct from the result of applying B to $\phi$.

According to this principle, (44b) can be regarded as a special rule. It, thus, takes precedence over (44a), a general rule, and correctly assigns only the irreducibly de se interpretation. With the Property Assignment Rules

(44), then, we are, in a sense, claiming that attitudes irreducibly de se entail attitudes de dicto not only semantically but also syntactically.[6]

Keeping these Property Assignment Rules in mind, let us now turn to the semantics of a simplex sentence like (46):

(46) John [$_{VP}$ loves cats ]

In this sentence, there is a well-known relation of predication holding between the subject NP and the predicate phrase. Williams (1980) points out that we must postulate a rule as informally stated in (47), in order to capture this relation. Let us refer to this position as the "Predication Rule Approach":

(47) The Rule of Predication:

Coindex an NP in a sentence with a predicate phrase that is c-commanded by and c-subjacent to that NP.

Notice, however, that, in a sense, the predication relation can be regarded as a special case of an irreducibly de se interpretation. By uttering sentence (46), for instance, the speaker asserts that John possesses a property of loving cats, which is equivalent to placing John into the subpopulation of "cat-lovers" in the very world he is in, rather than relating him to some other possible world. If this intuition has any validity, it must be the case that the LF representation of (46) falls into the structural schema described in Property Assignment Rule (44b), where the presence of syntactic binding guarantees the irreducibly de se interpretation. Such an LF-representation of sentence (46), in fact, is exactly what we derive in the Internal Subject Analysis, as illustrated in (48):

(48) John$_1$ [$_{VP}$ $t_1$ loves cats ]

With a slight generalization of the Property Assignment Rules, as illustrated in (49), in other words, we can derive the rule of predication from a more general rule of semantic interpretation we have proposed:

(49) Property Assignment Rules (Revised):[7]

a. L: [$_{XP}$ NP ... XP ] ==========> NP = attitude-holder
XP = attitude de dicto

b. L: [$_{XP}$ $NP_1$ ... [$_{XP}$ $NP_1$ ... ]] ==> NP = attitude-holder
XP = attitude irreducibly de se

In a sense, our approach with the Property Assignment Rules and the Predication Rule Approach try to capture the same phenomena from a totally opposite direction . In our approach, the predication relation holding in sentences like (50a) through (50d) is claimed to be made possible by the presence of syntactic binding in each sentence:

(50) a. $John_1$ [$_{XP}$ $t_1$ loves cats ]

b. $John_1$ [$_{VP}$ $t_1$ wants [$_{XP}$ $PRO_1$ to be happy ]]

c. $Mary_1$ [$_{VP}$ $t_1$ [$_{V'}$ met $John_2$ ] [$_{XP}$ $PRO_1$ angry at $herself_1$/*himself ]] (cf. Roberts (1988))

d. $Mary_1$ [$_{VP}$ $t_1$ [$_{V'}$ met [$_{NP}$ $John_2$ [$_{XP}$ $PRO_2$ angry at $himself_1$/*herself ]]]] (cf. Roberts (Ibid.))

In the Predication Rule Approach, on the other hand, the control in (50b) is claimed to be derived by way of the predication relation holding between the matrix subject and the complement clause, and the other cases do not involve any syntactic binding. The question is whether there is any empirical difference between the two approaches.

Consider, first, the sentence in (51):

(51) $John_1$ believes [$_{XP}$ $himself_1$ to be intelligent ]

In this sentence, there exist both a binding relation between the two subjects and a predication relation or, in our terms, belief de se, as informally described in (52):

(52) [ $John_1$ is intelligent ]

Both approaches seem to capture these facts equally well. In our approach, (52) is derived by way of the syntactic binding in (51), and in the not unreasonable extension of the Predication Rule Approach, the syntactic binding in (51) can be derived by way of the predication relation in (52).

Consider now (53):

(53) $\underline{\text{John}_1}$ believes [$_{\underline{XP}}$ that $\text{he}_{1/2}$ is intelligent ]

As indicated by the indexation, this sentence exhibits optionality of syntactic binding between the matrix subject and the complement subject. In addition, as indicated in (54), this sentence can provide two distinct instances of predication relation, or in our terms, it provides ambiguity between belief irreducibly de se and belief de dicto:

(54) a. [ $\text{John}_1$ is intelligent ] (belief irreducibly de se)
b. [ $\text{Bill}_2$ is intelligent ] (belief de dicto)

Here a cucial difference arises between the two approaches. If one tries to capture the binding facts in (53) in terms of predication, as in the Predication Rule Approach, one would have to stipulate that the rule of Predication is optional. This stipulation, however, leads one to an incorrect conclusion that the syntactic binding between the two subjects in (51) can be optional. One can, of course, claim that the binding and predication are totally independent phenomena. This, however, leaves unaccounted for why the presence of obligatory binding and that of predication relation go hand in hand. That is, as observed in (51), predication is obligatory when binding is obligatory, and as observed in (53), predication is optional when binding is also optional. If we adopt the approach incorporating the Property Assignment Rules, on the other hand, we can ascribe the optionality of the irreducibly de se interpretation in (53) and its obligatoriness in (51) to the optionality of pronominal binding in (53) and the obligatoriness of anaphor binding in (51) prescribed by the Principles A and B of the Binding Theory at LF.

Our approach with the Property Assignment Rules in (49), thus, has at least one empirical advantage over the Predication Rule Approach, in addition to its theoretical advantage such that it derives the rule of predication from a more general rule of semantic interpretation.[8]

**NOTES:**

*I am grateful to Emmon Bach, Andy Barss, Greg Carlson, Barbara H. Partee, David Pesetsky and Edwin Williams for helpful comments at various stages of this paper. I would also like to thank the participants of NELS 19, especially Chris Collins, Jim Higginbotham, Alan Munn and John Whitman. I have found it impossible to incorporate their comments and suggestions fully into the present paper due to the limit of the length set by the editors of this volume. I have also learned that Chierchia (to appear) proposes an approach quite similar to ours, at least in spirit. I have, therefore, decided to finish the written version of the talk first, and then write another longer version of a paper (or more than one separate papers) incorporating these.

**1.** Kitagawa (1986) has also proposed that English has a "VOS" underlying order. For the sake of simplicity, however, this particular claim will be suppressed in this paper.

**2.** Our approach differs from those proposed by Wasow and Williams in that the base-generatd empty VP is not expanded.

Note, first, that the "VP-Copy" approach to VP-Ellipsis, which reconstructs the antecedent VP at LF, permits us to dismiss the well-known counterargument to the "Non-expansion" Hypothesis based upon the "missing antecedent" (Grinder and Postal (1971), Wasow (1974)). The paradigm in (i) can now be accounted for without recourse to the deletion analysis nor the Empty Structure Hypothesis, since the pronoun it in (i-c) comes to have an antecednt after VP-Copy applies at LF, as illustrated in (ii):

(i) a.*John doesn't have a car, and it is a convertible.

b. John doesn't have a car, but Bill has ***a car***, and it is a convertible.

c. John doesn't have a car, but Bill does [VP e ], and it is a convertible.

(ii) LF: John doesn't have a car, but Bill does [VP have ***a car*** ], and it is a convertible.

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In the Empty Structure Hypothesis, it must be assumed, as noted by Williams (1977), that VP-Copy replaces not only the sequence of empty lexical nodes ([VP e e ]) but also the sequence of an empty node and a trace ([VP e $t_1$ ]), in order to account for the well-formedness of (iii):

(iii) S: John, who$_1$ I wanted to [VP meet $t_1$ ], and did [VP e $t_1$ ]

L: John, who$_1$ I wanted to [VP meet $t_1$ ], and did [VP meet $t_1$ ]

In the "Non-expansion" Hypothesis, on the other hand, such complication is not called for.

3. Even if some other grammatical factor like gender agreement requires the opposite result, this constraint cannot be violated:

(i) *Mary told Bill about herself, and Sam told Sue about herself, too.

4. See Higginbotham (1983) for a different view. If we adopt his "linking" framework, our claim can probably be paraphrased as "all linking of A-positions takes place at LF." We should probably assume also that there are two kinds of pronouns --- those with an inherent index (referential pronouns) and those without (anaphoric pronouns). (I must leave this discussion for another occasion, however.)

Barbara H. Partee (p.c.) also pointed out to me that, if NP-movement indeed takes place without coindexation, we should predict that the sentence like (i) below permits all four readings as examplified in (ii a-d) in British English, in which either a direct object or an indirect object may be extracted in passive. In reality, however, (ii a) and (iic) but not (ii b) and (ii d) seem to be allowed:

(i) He was sold them, and we were, too.

(ii) a. he = baseball player, we = baseball player
b. he = baseball player, we = team
c. he = slave trader, we = slave traders
d. he = slave trader, we = slaves

Note, however, that the relative order of the trace and the unmoved object in the first clause will be retained also in the second clause after VP-Copy applies at LF, as illustrated in (iii). This presumably is responsible for the reduction of the ambiguity observed in (i):

(iii) a. LF: He was [$_{VP}$ sold them t ], and
we were [$_{VP}$ sold them t ], too. (= (iia))

b. LF: He was [$_{VP}$ sold t them ], and
we were [$_{VP}$ sold t them ], too. (= (iic))

It may be the case that the Parallelism Constraint in (32) also plays a role here.

5. The relevant questions to be asked here, then, will be: (a) whether the sentences in (i) and (ii) below involve an irreducibly de se interpretation or a de re interpretation (Castañeda (1968)), and (b) whether there holds a relation of syntactic binding between the matrix subject and the embedded subject in each of the sentences:

(i) (Quintus the war hero has suffered from amnesia, and is reading about himself without realizing that he is reading about himself.)

Quintus believes that Quintus was brave.

(ii) (John sees someone in the mirror without realizing that it is John himself.)

John believes that he is extremely good-looking.

Under these circumstances, neither (i) nor (ii) seems to be the report of Quintus' and John's own belief expressible as in (iii) and (iv), respectively:

(iii) I was brave.

(iv) I am extremely good-looking.

It probably is the case, then: (a) that the matrix subject and the embedded subject carry distinct indices, (b) that no irreducibly de se interpretation is involved, (c) that the referential identity of the two subjects is pragmatically established, and (d) that the presence of syntactic binding is the sufficient and necessary condition for deriving an irreducibly de se interpretation. Again, however, I must leave this discussion for another occasion. See also Chierchia (to appear) for relevant discussion.

**6.** The Elsewhere Condition, then, should be regarded as the first approximation of the device to ensure such an isomorphism (concerning entailment) in the process of mapping among linguistic representations.

**7.** I will leave it open what exactly XP ranges over.

**8.** Our approach with the Property Assignment Rules can probably capture the distinction between "categorical" and "thetic" judgment pointed out by Kuroda (1972) concerning wa-marked NPs and ga-marked NPs in Japanese, although the "focused" ga-marked NPs seem to pattern with wa-marked NPs.

Our approach may also have some non-trivial implications for the type theory in semantics. I must leave the pursuit of these topics, however, for another occasion.

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