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SELECTIONAL RESTRICTIONS ON SUBJECTS AND OBJECTS OF
TRANSITIVE VERBS.

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IN AGREEMENT WITH CHOMSKY, THE AUTHOR DISCUSSES SELECTIONAL RESTRICTIONS ON SUBJECTS AND OBJECTS BASED ON CRITERIA OF WHAT MUST OR CANNOT OCCUR IN THOSE SLOTS IN A SENTENCE. THROUGH AN ANALYSIS OF INTERDEPENDENCY RELATIONSHIPS, VARIOUS DEEP- AND SURFACE-STRUCTURE FEATURES ARE DISTINGUISHED CONCERNING TRANSITIVE VERBS AND THE INTERPRETATION OF THEIR LEXICAL/SEMANTIC ENVIRONMENTS. TWO TYPES OF VERBS--"SURPRISE" AND "TELL"--ARE TREATED IN DETAIL. IT IS FOUND THAT "SURPRISE" VERBS MAY APPEAR WITH ANIMATE SURFACE-STRUCTURE OBJECTS, BUT REQUIRE ANIMATE DEEP-STRUCTURE SUBJECTS, AND ARE INTERPRETED AS EITHER "INTENTIONAL" OR "ACCIDENTAL." MODAL ENVIRONMENTS SEEM TO BE INSTRUMENTAL IN DETERMINING THIS MEANING, AND APPARENTLY THE CONDITIONS THAT GOVERN THE INTENTIONAL-ACCIDENTAL DICHOTOMY ARE SIMILAR TO THOSE GOVERNING "FLIP" TRANSFORMATIONS (REVERSAL OF SUBJECT AND OBJECT) IN "SURPRISE" VERBS. "TELL" VERBS HAVE MORE NUANCES OF SEMANTIC INTERPRETATION, BUT GENERALLY MEAN EITHER "NOTIFY" OR "COMMAND." THEY REQUIRE ANIMATE SURFACE-STRUCTURE OBJECTS, AND DO NOT UNDERGO "FLIP" TRANSFORMATIONS. ONE GENERAL CONCLUSION IS THAT IF A VERB REQUIRES AN ANIMATE NOUN AS THE OBJECT IN DEEP-STRUCTURE, THE SUBJECT MUST ALSO BE ANIMATE. THE AUTHOR MAKES A PRELIMINARY CLASSIFICATION OF ENGLISH VERBS BASED ON THE RESTRICTIONS DISCUSSED. (FB)

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**Selectional Restrictions on Subjects
and Objects of Transitive Verbs**

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July 1967

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Preliminary Draft

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In *Aspects of Theory of Syntax* (Chomsky, 1965), Chomsky expresses selectional restrictions for transitive verbs in terms of a single un-analyzable complex symbol; e.g.,

(1) [+ [+Animate] ___ [+Human]]

would mark a verb whose subject is allowed to be animate and whose object may be human. He discusses a possible alternative approach which would assign selectional features of the subject and object independently, as in (2):

(2) [+ [+ Animate] ___], [+___[Human]]

Chomsky's preference for the first formulation is based on sentence frames such as the following:

(a) He _____ the platoon.

(b) His decision to resign his commission _____ the platoon.

(c) His decision to resign his commission _____ our respect.

The verb "command" can occur in (a) and (c) but not in (b). In (a) both subject and object are animate, and in (c) both are inanimate. If subject and object selectional features were assigned independently, then "command" would not be excluded from frame (b). However, as Chomsky points out himself, this argument is very weak since it ignores "the question of how to enter lexical entries with a range of distinct but related syntactic and semantic features." (Chomsky, 1965, p. 120).

Lakoff, in his dissertation (Lakoff, 1966), argues that the second alternative is to be preferred. The reasons he gives are, first, that pairs of verbs such as "run" (intrans.) and "throw" (trans.) share the linguistically significant property of taking animate subjects which is not expressed by unanalyzable selectional features; and second, that there

are generalizations involving independent selectional features of subjects and objects which could not be stated in any but an ad hoc fashion in terms of unanalyzable features, (Lakoff, 1966, Appendix D). For example, Hall's observation (Hall, 1965) that the vast majority of transitive verbs require an animate subject could not be expressed since there would be no mechanism for referring only to selectional features of subjects.

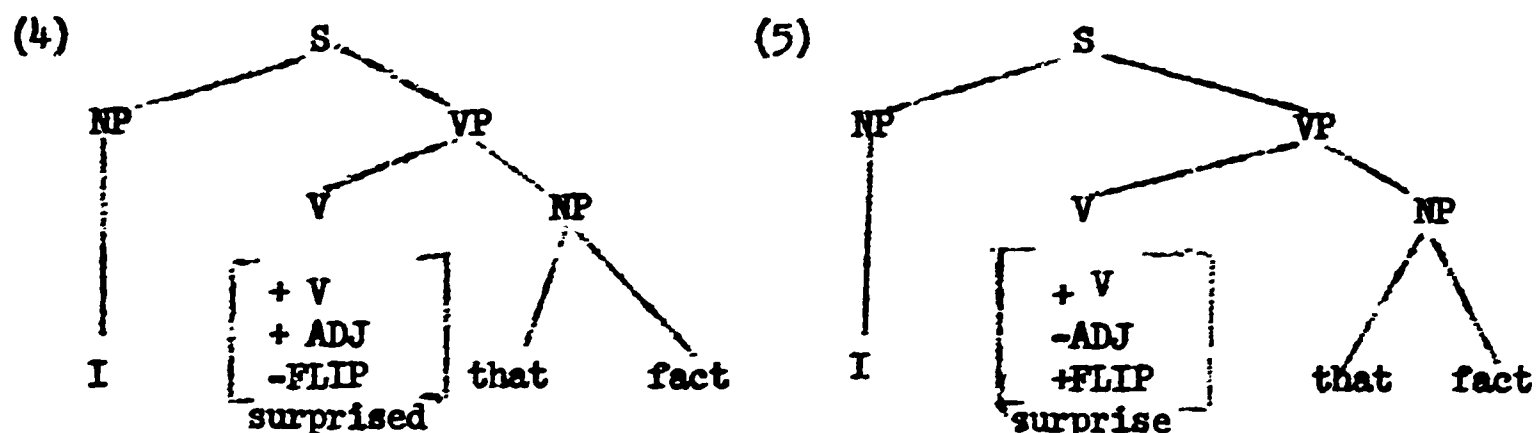
In this paper I shall present evidence for a stronger relation of interdependency between subjects and objects than those observed by Hall and by Lakoff, and this in turn will provide a further argument that selectional restrictions for subjects and objects must be treated as separate features. It will be assumed, despite some recent proposals to the contrary (Lakoff, 1967), that deep structures are to be represented approximately as they are in Lakoff's dissertation (Lakoff, 1966). I shall also assume the essential correctness of Lakoff's proposal that verbs and adjectives are to be treated as members of a common class, VERB, differing only in the feature +ADJ (Lakoff, 1966, Appendix A).

I begin the discussion with verbs which require an animate surface-structure object, but whose surface-structure subject may be animate or inanimate. Let us first focus attention on the sub-class of these verbs, which I shall for want of a better term call the "surprise" verbs, consisting of . . .)

(3) "surprise, amuse, amaze, please, annoy, worry, startle, confuse, delight, perplex, dismay, incense," etc.

These share the semantic property of indicating a mental or psychological state engendered in an animate being. Lakoff (1966) has proposed that in the deep structures such verbs actually require an animate subject (not object). The deep structures he suggests as underlying the sentences

"That fact surprised me," and "I was surprised at that fact," would be:



P-marker (4) would undergo transformations which add "be," a tense marker, and the preposition "at" (which is determined by the VERB) to give "I was surprised at that fact." P-marker (5) undergoes a transformation which is triggered by the feature +FLIP in the feature matrix of the VERB "surprise" and all other VERBs of this category. Its effect is to interchange the order of the subject and object. After tense spelling and the conversion of the pronoun to the objective form, (5) would yield "That fact surprised me."

Lakoff's principal arguments for these underlying structures are that 1) we feel intuitively that "I" stands in the subject-verb relation to "surprise," and 2) that this intuition is supported by the fact that the nominalized form of both (4) and (5) is "my surprise at that fact." As for the FLIP transformation, it or something similar must be postulated in any event to account for the synonymy and corresponding co-occurrence restrictions evident in the sentences "That surprised me," and "I was surprised at that," no matter which NP is regarded as underlying subject.

I shall argue that the P-markers underlying sentences containing "surprise" verbs are somewhat more complex--in fact, they contain the CAUSATIVE and INCHOATIVE PRO-verbs, which were first postulated by Lakoff

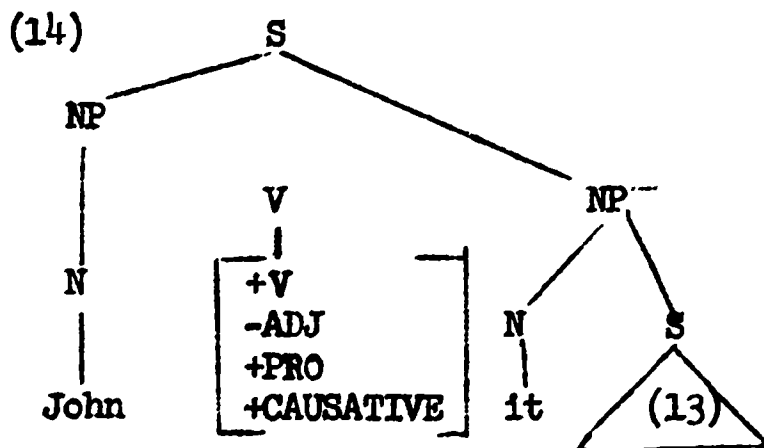
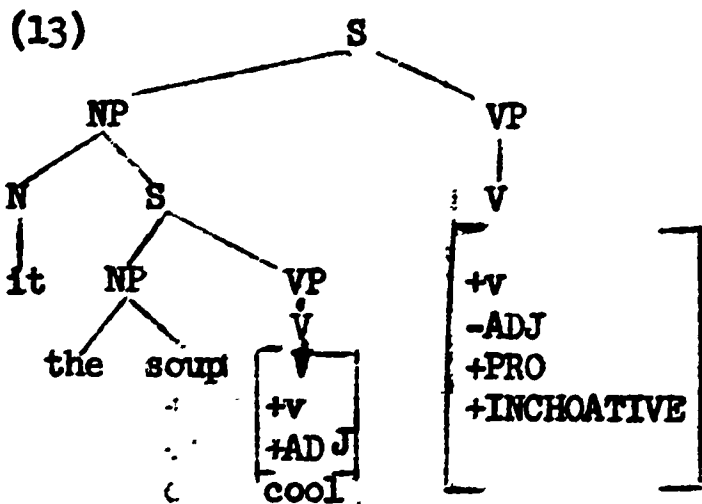
(1966, pp. IV-4-18) to account for the correspondence of selectional restrictions and the relations of synonymy and entailment among sentences such as the following:

- (6) The soup is cool.
- (7) The soup became (got, came to be) cool.
- (8) The soup cooled.
- (9) John cooled the soup.
- (10) John caused the soup to cool.
- (11) John brought it about that the soup cooled.
- (12) John caused the soup to become (get, come to be) cool.

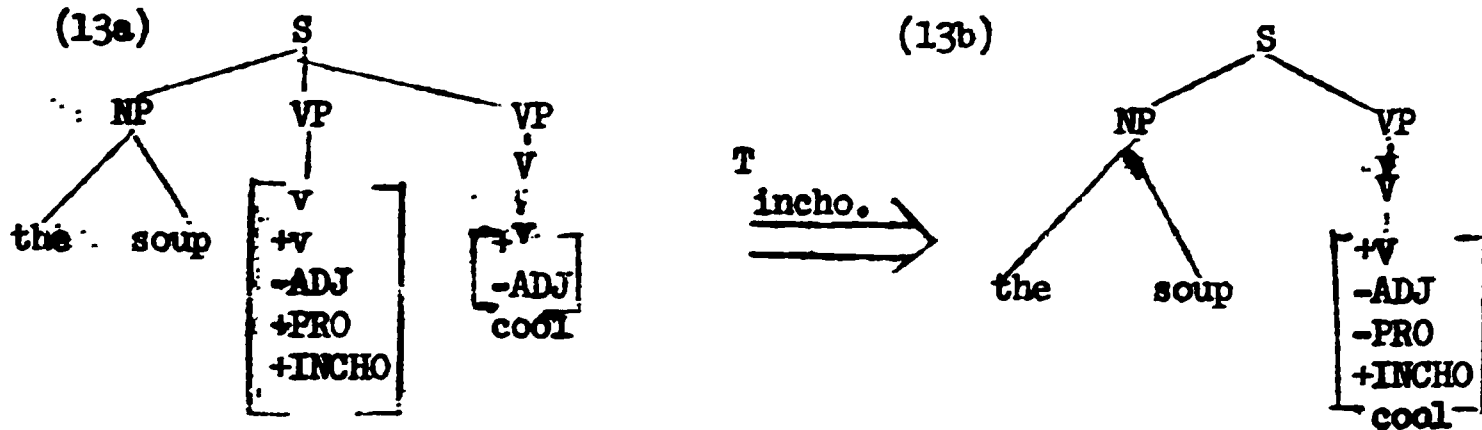
Sentences (7) and (8) are synonymous and entail sentence (6).

Sentences (9) - (12) are synonymous and entail sentences (7) and (8), and therefore (6). Furthermore, the same selectional restrictions hold between "soup" and "cool" in every case. For example, in substituting "sky" for "soup" and "sick" for "cool" the same selectional restriction (viz, that of predicating "sick" of an inanimate object) is violated in each sentence. (Note that in sentences (8) and (9) "sick" would be spelled in its causative or inchoative form "sicken.")

The PRO-verb INCHOATIVE has a semantic interpretation like that of the verbs "become," "get," and "come to be," and occupies the same position as these verbs would in an underlying P-marker. CAUSATIVE occupies the place of "cause" or "bring about" and has a corresponding semantic interpretation. The deep structures postulated for sentences (8) and (9) are:

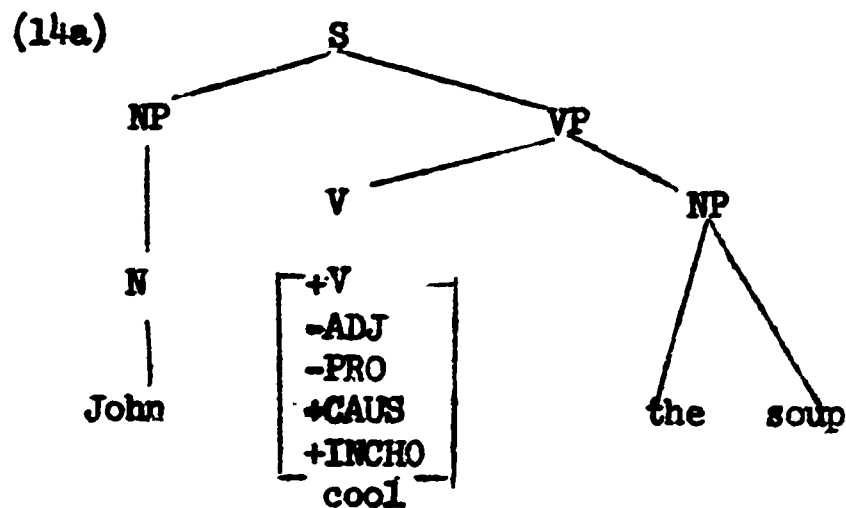


P-marker (13) undergoes the familiar transformations of EXTRAPOSITION, IT-REPLACEMENT, and IDENTICAL-NP-DELETION to give the derived P-marker (13a)



Lakoff then postulates a transformation, INCHOATIVE, which replaces the PRO-form verb with the non-PRO form at the right and changes the feature +PRO to -PRO. The result is the P-marker (13b) which after tense spelling might become, for example, "The soup cooled."

The same series of transformations applies to the embedded sentence in P-marker (14), and then another transformation, CAUSATIVE, replaces the causative PRO-verb with the verb to the right, giving P-marker (14a):



This, by tense addition and a spelling rule specifying that the causative form of "cool" is "cool", would yield "John cooled the soup."

The same arguments that Lakoff used in postulating these underlying structures can be carried over directly to the "surprise" verbs. Note sentences (15) - (21) below:

- (15) John is angry.
- (16) John became (got, came to be) angry.
- (17) John angered.
- (18) The decision angered John.
- (19) The decision caused John to anger.
- (20) The decision brought it about that John angered.
- (21) The decision caused John to become (get, come to be) angry.

Here, too, the selectional restrictions between "John" and "angry" (or its inchoative and causative spelling "anger") are the same in each sentence, and the relations of synonymy and entailment parallel those of sentences (6) - (12). Furthermore, to suggest that "John was angered (or angry) at the decision," comes from a P-marker such as (4) or (5) leaves unexplained the curious fact that the "object" of the verb in the deep structure bears a casual relation to the rest of the sentence.

Another piece of evidence that the "surprise" verbs are to be analyzed as causatives and inchoatives comes from Finnish (I am indebted to Lauri Karttunen for this observation). Inchoative and causative in Finnish are overtly marked and are rather productive verbal affixes. The correspondents of the "surprise" verbs all occur as causatives and inchoatives rather than independent lexical items.

- (22) puu 'wood'
 - (23) puu/tu/a 'to become like wood (i.e., unfeeling)'
 - (24) puu/du/tta/a 'to anaesthetize'
 - (25) sula/a 'to melt (intrans.)'
 - (26) sula/tta/a 'to melt (trans.)'
 - (27) *sui
 - (28) suu/ttu/a 'to become angry'
 - (29) suu/tu/tta/a 'to annoy'
- (-a is the infinitive marker; -tta-, the causative, and -tu-, the inchoative affix; -tu- becomes -du-, and -ttu- becomes -tu- by a regular consonant weakening rule)

If we postulate that sentences such as (17) "John angered," and (18) "The decision angered John," come from underlying P-markers similar to (13) and (14), then exactly the same sequence of transformations will apply as in the case of the "true" causatives and inchoatives, and thus no new apparatus need be added to the grammar. However, we have gained

an explanation for the causative relationship which "the decision" is felt to bear to "anger" and "John". Of course, the price is the necessity of marking the lexical entries for all "surprise" verbs for applicability of the CAUSATIVE and INCHOATIVE transformations, since both are minor rules*.

*Note also that some verbs have a causative form but no inchoative form. Cf., The knife is sharp. *The knife sharpened. John sharpened the knife. John is surprised. *John surprised. That fact surprised John. These must be marked in such a way that if they undergo the INCHOATIVE transformation then they must also under CAUSATIVE. This is easily arranged if we adopt Lakoff's suggestion (Lakoff, 1966, Appendix E) to allow Boolean combinations of features in the lexicon.

The FLIP transformation must be retained in order to account for the following paraphrases* of sentences (18) - (21):

- (30) John was angry (angered) at the decision.
(31) John became (got, came to be) angry at the decision.

* These examples raise a few questions of detail in formulating the CAUSATIVE and INCHOATIVE transformations which will be ignored here.

But there is an additional complication. Note the following sentences:

- (32) John surprised me by jumping at me waving an eggbeater.
(33) John surprised me by being able to play the zither.

In (32) John is performing some intentional action in order to cause me surprise, but in (33) what John does (or rather, what he is able to do) surprises me, and there is no implication that John has intended to cause this reaction or even that he is necessarily aware of it. Thus, sentence (34) is ambiguous in this regard:

- (34) John surprised me.

Note also that a sentence such as (35) which has undergone the FLIP transformation contains "surprise" only in the non-intentional or "accidental" sense:

(35) I was surprised at John.

An imperative such as sentence (36), however, has only the intentional interpretation:

(36) Surprise Bill with a sombrero on his birthday!

The intentional sense cannot occur when the subject of the causative PRO-verb is inanimate. Thus, sentences (37) and (38) have only the non-intentional sense:

(37) That fact surprised me.

(38) I was surprised by that fact.

The notions I am using here appear to correspond exactly to the "Intentional" and "accidental" meanings examined by Lakoff in his paper on instrumental adverbials (Lakoff, 1967). He points out that a sentence such as (39) is ambiguous with regard to the deliberateness of the action,

(39) I cut my finger with a knife.

and he gives some syntactic environments in which the "accidental" sense cannot occur:

(40) I was cutting my finger with a knife.

(41) Cut your finger with a knife!

(42) I can cut my finger with a knife.

(43) I carefully cut my finger with a knife.

(44) Ethelbert forced me to cut my finger with a knife.

It turns out that these same environments exclude the "accidental" sense of the "surprise" verbs:*

(45) I was surprising John with a loud noise.

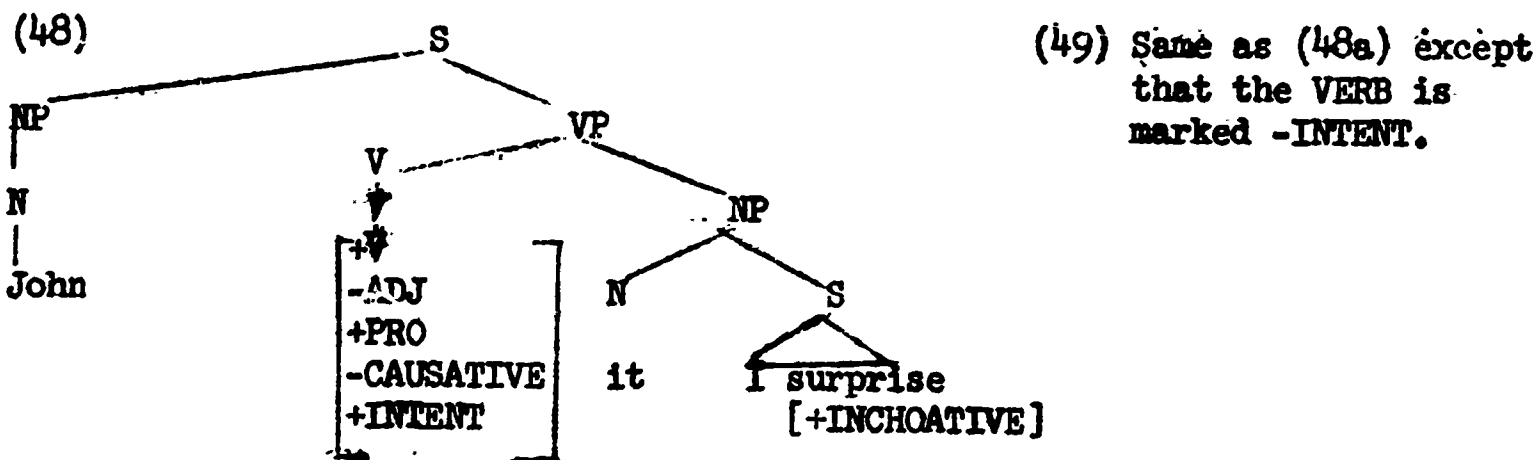
(46) Surprise John with a loud noise!

Thus the evidence suggests that necessary conditions for a transitive verb to appear in these environments is that the subject be animate and that the semantic interpretation be of the "non-accidental" or "intentional" sense of the action. These conditions turn out to be exactly those which govern the FLIP transformation in the "surprise" verbs.

*Lakoff also points out that inanimate subjects are excluded from these frames:

(47) * The table cut my finger with a knife.

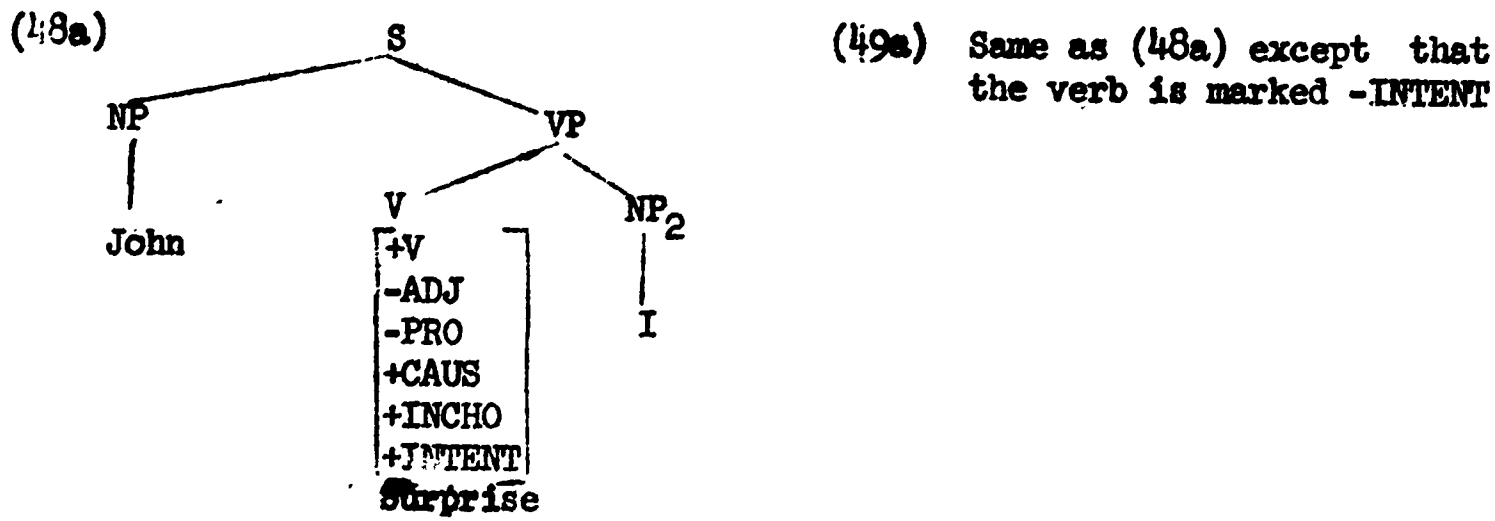
If we agree that the CAUSATIVE PRO-verb may have the feature +INTENT*, that the +INTENT feature requires the subject of the PRO-verb to be animate, and that the -INTENT feature is necessary for the FLIP transformation to apply, then we can explain the curious set of facts illustrated in sentences (30) - (38). Two P-markers underly this set of sentences--(48) and (49):



* The semantic interpretation of +INTENT will specify that the action is willful, deliberate, purposive, etc., while the minus value will merely indicate that the action is unspecified in this regard. Thus +INTENT is "marked", -INTENT "unmarked".

Just after application of the CAUSATIVE transformation, P-markers

(48) and (49) would appear as follows:



With no further transformations except tense spelling, both (48) and (49) would give "John surprised me," which is ambiguous. Further application of the PASSIVE would give "I was surprised by John," which is again ambiguous. The same is true of the nominalizations of these sentences: "John's surprising me...", "my being surprised by John...", etc.

Only P-marker (49) may undergo the FLIP transformation to yield "I was surprised at John," which is unambiguous. Another transformation which (49) but not (48) can undergo forms "ing-to" adjective constructions: e.g., "John was surprising to me," which again is unambiguous.*

* It has often been pointed out (See, for example, Chomsky, 1965, pp. 150-151) that the "surprise" verbs can appear with the suffix "-ing" (or sometimes with an alternative such as "-some", "-ful", etc.) in the position of true adjectives--i.e., modifying a noun and modified by "very"--whereas this is not true in general of transitive verbs. Cf., "a very surprising person" vs. *"a very hitting person." Note also that it is always the -INTENT sense which appears in these constructions.

I am indebted to Lauri Karttunen for another example from Finnish which seems to indicate that a similar distinction must be drawn there between intentional and non-intentional causatives. Causative forms may have an additional causative affix added to them but only when both have the "intentional" sense:

- (50) huvi 'fun'
- (51) huvi/tta/a 'to amuse'
- (52) huvi/ta/tta/a 'to have (someone) amused (by someone)'

The same device also seems to account for the so-called "reflexive inchoative", which I believe is really a "reflexive causative." For example, the sentence "John hurt himself" is ambiguous as can be seen from inspection of (53):

- (53) John hurt himself (a) when he fell down.
(b) by hitting himself on the head with a hammer.

The derivation of these forms is now straightforward: each comes from a P-marker like (48) or (49) in which $NP_1 = NP_2$.

Observe that the "surprise" verbs can also occur in this construction:

- (54) John surprised himself (a) in order to cure his hiccups.
(b) by doing well on the examination.

Thus, this class of verbs, the "surprise" verbs, which may appear with animate surface-structure objects in fact require animate deep-structure subjects and which, furthermore, are embedded in P-markers containing the INCHOATIVE and CAUSATIVE PRO-verbs. The latter have a feature, INTENT, specified as + or =.

I should now like to consider another category of verbs which require animate surface-structure objects. These are "tell, warn, caution, admonish, advise, etc." which we shall label the "tell" verbs. Although these verbs usually occur only with an animate subject in the surface structure, there is a restricted set of inanimate entities which may also occur:

- (55) John } warned me that no fishing was permitted.
The sign }

- (56) The general } ordered the troops to attack at dawn.
The telegram }

- (57) My neighbor } told me that the fire had reached the
The glow on the horizon } refinery

One might argue that sentences (55) - (57) really involve personification of a particular kind or perhaps that they function as instrumentals. If so, neither analysis would affect the final argument of this paper.

However, I believe that there are good grounds for supposing that these verbs do not have animate direct objects in the deep structure.

First, we must distinguish two senses of the "tell" verbs. In one meaning they are like "inform" and "Notify" and carry the idea of imparting information or causing someone to become aware of something. The other

sense is similar to "direct", "order", and "notify" and carry the idea of imparting information or causing someone to become aware of something. The other sense is similar to "direct", "order", and "command" in that the animate "object" is desired to take (or not to take) some action. The two senses are readily apparent in:

(58) John advised me that he had cornered the mango market.

(59) John advised me to corner the mango market.

The two senses are distinguished syntactically also, since at least in my own dialect, the nominalized forms can have only the latter sense:

(60) John's { advice
recommendation
admonition
warning
order
instruction } to me was to sell AT&T.
to me was that he sold AT&T.*

In this, these verbs seem to parallel the verbs "persuade" and "convince" which have been discussed by Lakoff (1966, IX-1-9). A verb such as "warn," for example in the "notify" or "inform" sense would appear in a deep structure much like (14) containing the CAUSATIVE and INCHOATIVE PRO-verbs, but "warn" would have a semantic interpretation in its lexical entry without the meaning components of "cause" and "become". Thus, its lexical meaning would be something like "cautiously or prudently aware." In this form it may take an object (or complement) preceded by the prepositions "of" or "about". If this object is an ordinary noun phrase, the usual series of transformations would produce sentences such as "Bill warned me about Aunt Agnes." With a sentential object, we would get underlying structures corresponding to "Bill warned me (about it) that he had no chocolate ice cream." "Warn" does not undergo FLIP, so we do not get forms such as "I was warned at Bill."

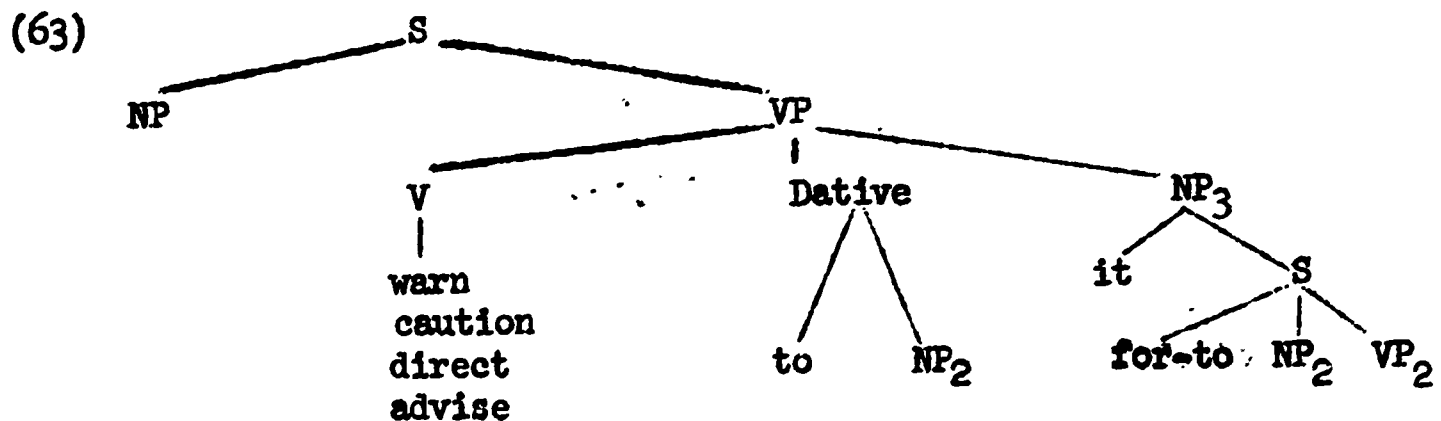
The "order" or "command" sense of "warn" cannot be treated as a causative, however, since to order, command, or warn someone to do something does not entail that he will do it or even that he intends to do it. If someone chose to ignore an order or warning, it would still be true that he had been ordered or warned. I would suggest that this sense of "warn" occurs in deep structures with indirect objects. Consider the following sentence forms and their corresponding nominalizations:

- | | |
|---------------------------------------|---------------------------------|
| (61) I gave NP to Bill. | My gift to Bill was NP. |
| I donated NP to Bill. | My donation to Bill was NP. |
| I assigned NP to Bill. | My assignment to Bill was NP. |
| I admonished (to) Bill
(for-to S). | My admonition to Bill was to S. |

Note that the preposition preceding "Bill" is always "to" in the nominalized forms, while the usual preposition after deverbal nouns is "of."

- | | |
|----------------------------|----------------------------------|
| (62) I chose Bill. | My choice for Bill... |
| I supervised Bill. | My supervision of Bill... |
| I expected Bill (for-to S) | My expectation of Bill was to S. |

I would therefore postulate a deep structure such as (63) for the "warn" verbs used in the sense of "command" or "order".



I have indicated the node dominating the NP which is the indirect object as "Dative", although I make no strong claim for the details of this proposal. In any event, it is at least clear that one must somehow distinguish NP₂ from NP₃ in the deep structure since each stands in a different grammatical relation to the verb phrase. Note also that NP₂ must occur twice in the deep structure because of such pairs as:

- (64) I directed John to examine the rock.
* I directed the rock to be examined by John.

If this analysis is correct, then the "warn" verbs also do not require animate direct objects in the deep structures in which they appear.

Let us now make a classification of English transitive verbs according to whether, in the deep structure, 1) they must have an animate subject, 2) they must have an inanimate subject, or 3) they may take either animate or inanimate subject. We may of course make a similar classification according to the animacy of the objects, thus forming nine categories. Representative verbs from each class are displayed in table (65).

Square # 4 is, of course, the one we have been at such pains to empty in the preceding sections. I have not been able, so far, to find any other examples for this category. We are thus faced with the surprising fact that three of the categories are totally empty, despite the fact that the semantic possibilities that they represent are far from inconceivable. That is, one would not think it unreasonable a priori that there might exist transitive verbs which would require, say, an inanimate subject and an animate object (as in square # 7). The only potential candidates I have been able to find for this category are "intoxicate," "inebriate," "sunburn," and "frostbite," all of which my dictionary assures me are transitive verbs. The first two are surely causatives; the latter two may be also, but in my dialect at least they sound odd in any form except

(65)

OBJECT

		<u>OBJECT</u>				
		+ANIM	+ANIM	-ANIM		
SUBJECT	+ANIM	marry divorce deputiz kidnap murder exile canonize	castrate censure coach pamper slander mock castigate	1 see know hear believe christen boycott supervise	2 mourn ridicule	3 cancel interpret conjugate pocket imagine think suppose
	-ANIM	----	4 pull throw fasten conceal comprise circle	5 connect take precede follow push cut	6 prove imply disprove partition catalyze clog	
	+ANIM	---	7 ---	8 ---	9 subtend entail connote adverb drift	
	-ANIM	---				

"sunburned" and "frostbitten." I have not so far found any prospects at all for square # 8.

If these observations are correct; then one might regard required features for subjects and objects as forming a hierarchy in which animate things take precedence over inanimate. More specifically, if a verb requires an animate noun as object in the deep structure, then the subject must also be animate. The class of verbs which requires inanimate objects is not constrained with regard to animacy of subject.

A natural question to raise at this point concerns square # 5: do these verbs allow inanimate subjects to occur with animate objects" At the moment, it seems that the answer is yes, but it is apparent that many of the verbs which might belong in this category should also be analyzed as causatives ("attract, repel, restrain," come to mind), and would thus be removed entirely from the category of transitive verbs. Other instances are analyzable as having instrumental adverbials appearing as surface structure subject as in the sentence "The knife cut John." Others are not so convincingly treated in this manner; for example, (66) The train took John to Toledo. vs. (67) Bill took John to Toledo. and some others which seem to involve "natural forces" such as wind, tide, rain, sun, etc.: (68) The wind pushed John against the building. The problems of homonymy vs. polysemy become very knotty in many of these cases, and for the moment I prefer to leave the question open and turn to another way in which the co-occurrence restrictions between subjects and objects may be extended.

So far we have dealt only with the feature ANIMATE. It is natural to ask whether there are similar restrictions for features such as HUMAN and PHYSICAL-OBJECT. From the examples I have been able to find, it seems that there are, and that these restrictions follow the natural scale:

HUMAN > ANIMATE > PHYSICAL-OBJECT > NON-PHYSICAL OBJECT

For example, if a verb requires a human object, then the subject must also be human. Examples:

(a) marry, murder, divorce, ordain, beget, kidnap

If an animate object is required (which might, of course be non-human), then as we have seen above, the subject must also be +ANIMATE.

(b) decapitate, dismember, pity, castrate, eviscerate

Similarly, verbs which require a concrete (physical-object) noun as object require a concrete subject.

(c) hit, build, diagonalize, stoke, mangle, weave, read, write, coat, paint, slice, ...

Verbs which require an abstract object are not restricted in choice of subject from the above scale:

(d) subtend, prove, presuppose, imply, entail, arbitrate, revoke, rescind, suppose, rationalize, contradict, catalyze

It is premature at this point to suggest that these restrictions constitute a semantic universal, but thus far I have been unable to elicit convincing examples of transitive verbs which would fit into squares # 4, 7 or 8 in table (65) from speakers of a variety of other languages.

In any event, there are some important consequences for the structure of the lexical redundancy rules in a grammar of English. It is apparent at once that we must express selectional restriction on transitive verbs with separate features for subject and object if we are

to be able to state this generalization at all. Furthermore, these facts seem to settle the question raised by Chomsky about whether selectional features should be listed in their positive or negative form -- i.e., should the lexical entries be specified in terms of selectional features for frames in which the item can appear or cannot appear? Chomsky adopts the latter alternative, which turns out to be the correct one for what we wish to state here, since the rules refer to what must (equivalently must not) appear as subject or object rather than what may appear.

The lexical redundancy rules which state these generalizations would be:

- (66) [- ___[Physical Object]] → [-[-Physical Object] ___]
[- ___[-Animate]] → [-[-Animate] ___]
[- ___[-Human]] → [-[-Human] ___]

And of course a generalization would be missed here if we did not use a cover symbol to represent the fact that the subject is always categorized with respect to the same feature as that in the object. Thus, the three rules above must be collapsed into:

(67) [- ___[-F]] → [-[-F] ___], where F is one of the noun sub-categorization features Physical Object, Anim, or Human. As an example, "murder" would be entered into the lexicon as

murder, [+V, +___NP, - [-Human], ...]

The convention above would add the feature [-[-Human] ___]. Then the redundancy rules outlined by Chomsky (1965, pp. 165-6) would add the features [- ___[-Animate]], [- ___[-Phys. Obj.]], [-[-Animate] ___], [-[-Phys. Obj.] ___] to specify that the subjects and objects must necessarily also be animate and concrete nouns.

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