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THE DESCRIPTION OF INVERSIONS
IN GENERALIZED PHRASE STRUCTURE GRAMMAR
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O. Classes of Inversions

As indicated in (1) and (2), there exist on the order of 20 to 40 types of inverted sentences in English.

1. INVERSIONS OVER "V"

- A. Loc. PP: At the table sat the Jackson Five.
 B. Dir. PP: Onto the rug scurried a little gray mouse.
 C. Loc. Adv: Here/Yonder had been the only building in Zweibruecken to escape Patton's rage.
 D. Dir. Adv: Here comes Lee.
 E. Abstract PP: To every VP rule with certain properties corresponds an S rule with related properties.
 F. Temporal: First would apply a fronting rule, perhaps Topicalization.
 G. Pres. Prt.: Crawling into the room came the messenger from Sparta.
 H. Past Prt. : Stacked in the corner were/stood bundles of magazines from the 1960s.
 I. AP: Increasingly vocal about the amount of mercury in the Bay are the residents of Marin County.
 J. Quotation "But..." stuttered/said/objected Kim.

2. INVERSIONS OVER FIRST AUXILIARY V

- K. Exclamations: (Boy) Do Kim and Leslie (ever) like historical linguistics!
 L. Conditionals: Had we been there, it wouldn't have been so easy for them.
 M. Neg. decl.: Can't nobody read that. [= 'Nobody can read that']
 N. Neg. Adv, Conj, PP: Never/Nor/Under no circumstances will this company accede to such absurd demands.
 O. Neg. NP: Not a bite did he eat.
 P. Neg. correl.: No sooner had they settled themselves than the phone began to ring again.
 Q. Pos. Adv: Often did the inhabitants of that village come to me to learn the ways of my people.
 R. Extent-
 -result: So carefully did the Indian detective plan his move (that Hoskins never suspected he was being led into a trap).
 S. Deictic 2R: Thus did the hen reward Beecher.
 T. SO 'too': So did Kim. So's your old man.

It is the aim of this paper to discuss the form that a successful analysis of these constructions might take, and some of its implications for the theory of generalized phrase structure grammar. I will show that the constructions within each class are different from each other in ways that prevent the formulation of a wholly general account, even within the two major classes, and

this conclusion probably holds across grammatical theories. The accounts I suggest within GPSG represent the similarities across constructions by taking advantage of independently necessary rules where possible. In some cases, however, they appear to require extension of the theoretical devices currently available within GPSG.

On syntactic grounds, there are two major classes of inversions, V-inversions, which have a NP representing the logical subject after the first non-auxiliary verb, and auxiliary inversions, which have the NP representing the logical subject appearing just after the first auxiliary verb. The examples in (1) exemplify the first class, while those in (2) exemplify the second class.

Subject-verb inversions like (3) have been described by Sag and Klein (1982) and Gazdar, Klein, Pullum and Sag (henceforth GKPS) (1982), as admitted by the topicalization-like rule in (4), which says that a sentence can consist of a PP and a VP of the sort that takes there as a subject, with a PP gap in it.

3. In the garden was a unicorn.

4. S --> P2, V1[INFORM there]/P2

The [INFORM there] on the V1 guarantees that the V1 is sanctioned by the rule in (5), which provides an "extra" NP which will be interpreted (Sag and Klein 1982) as the logical subject of the verb.¹

5. V1[INFORM there] --> V, NP, X2[+PRD]

The subject-auxiliary inversion (SAI) found in yes-no questions like (6) has been described in Gazdar, Pullum, and Sag (1982), and in GKPS (1984) as being sanctioned by a metarule of the form (7a) or (7b), which in effect admits an inverted clause corresponding to every VP headed by a finite auxiliary.

6. Has Kathy locked the door?

7a. V1[AUX, FIN] --> H, V1[Ø] ==> S[INV,AUX,FIN] --> H, S[Ø]

7b. V1[AUX, FIN] --> W ==> S[INV, AUX, FIN] --> W, NP.

As the Feature Cooccurrence Restriction in (7c) will stipulate that inverted clauses must have finite auxiliaries, it will not be necessary to specify [AUX, FIN] in this and similar rules.

7c. INV ⊃ [AUX, FIN]

The formulations in (7a) and (7b) are not quite equivalent; among other things, they impose different constituent structures, and thus, potentially, different constituent orders. I return to this in Sec. 2.2, to show that the necessity of analyzing most non-question inversions as involving unbounded dependencies excludes metarules like (7b) as candidates.

The (now implicit) specification [AUX, FIN] in the metarule guarantees that yes-no questions will begin with finite auxiliaries. The variable set of features [θ] guarantees that only those V_{is} that are syntactically well-formed as sisters of a finite auxiliary can occur as the main V_I in an inverted S headed by that finite auxiliary. Allowing the S in (7a) to consist of [V S] allows the constituent after the V to be anything that could begin a S. Thus:

- 8a. Has Holly left?
- 8b. Would under the rug be the best place to hide the journal? (GPS 51a)
- 8c. Is easy to please how one would describe him? (GPS 51b)
- 8d. Does that she is here surprise you? (GPS 51c)
- 8e. Will whether she arrives determine whether we stay? (GPS 51d)

The feature [INV] serves to mark the sentence as inverted, and on the V, by the Head Feature Convention (HFC), distinguishes verb forms that occur in inverted questions from corresponding ones that don't, as GPS mention (1982:613-14).

1.0 Properties of V-inversions and Aux-inversions

As background for the analyses to be given below, I want to focus briefly on the properties that both families of inversions share, and on those that distinguish them from each other. Then I will sketch what a comprehensive description of V-inversions will have to account for. I will show that to a limited extent, this can be done by extending the account given by GKPS (1982), but a full account will require additional rules, and additional kinds of rules. After that, I will sketch a treatment of Aux-inversions which exploits the independently necessary SAI metarule, but in different ways for different constructions.

1.1 Grammatical relations

The grammatical relation borne by the post-verbal NP has been discussed by Green (1977) and Postal (1977). This NP unquestionably controls agreement in both V-inversions, and Aux-inversions, as shown in (9).

- 9a. Near the fountains was/*were a unicorn.
- 9b. Near the fountain *was/were two unicorns.
- 9c. Never *have/has he laughed so much.
- 9d. Never have/*has they laughed so much.

Whether the control of agreement entails that this NP is, or ever "was" a subject is relevant only to the extent that the grammatical theory requires reference to grammatical relations.

1.2 Alternative constructions

Most V-inversions which involve an initial non-subject, like those in (1), are more or less obligatorily triggered by the

initial non-subject. This is a complex matter, however, and is affected (differentially from construction to construction) by the definiteness and pronominality of the logical subject (10a,d-g) and the by the specificity of the verb (10b,k). To the extent that the unacceptability of the uninverted main verb types is due to pragmatic factors (Green ms.), it is unnecessary to exclude them on syntactic grounds; it is not clear that similar explanations are available for the absence of uninverted auxiliaries in examples like (11d-f). Inversion in conditionals is obligatory (11b), given the absence of the conditional marker if.

- 10a. In the garden *a/the unicorn was. (Maybe: In the garden he was.)
 10b. In the garden a unicorn ??stood/slept.
 10c. Into the garden a unicorn ran.
 10d. *Into the game Jenkins is.
 10e. *Here a bust of Lenin is. (But: Here it is.)
 10f. *Here the bus comes. (But: Here it comes.)
 10g. Off Sandy ran.
 10h. *At issue an important principle is.
 10i. ??To every VP rule, an S rule corresponds.
 10j. Leaning against the wall an old man *was/slouched.
 10k. Buried in Arlington National Cemetery a great leader *is/??lies.
 10l. *Increasingly appalled at the amount of mercury in the Bay the residents of Palo Alto are.
 10m. "Off with his head," the Queen muttered.
 11a. You have a lot of nerve!
 11b. *We had been there, we would have spoken up.
 11c. Nobody don't mess around with me.
 11d. *Never I had been so high.
 11e. *Not a bite Chris ate.
 11f. *No sooner we had left than our dilatory guest arrived.
 11g. Often the inhabitants of that village came to us for advice.
 11h. ??So aghast they were that they failed to notice that he was soaking wet.
 11i. ??Into such a metaphorical corner they had backed themselves.
 11j. In this way the children let slip their true feeling about their leader.
 11k. *So Sandy did.²

1.3 Selectional restrictions, subcategorization, and long-distance dependency

The verb inversions in (1) all involve restrictions on the verbs. At first this appears to be a (relatively) simple case of subcategorization, but certain systematic dependencies between the verb and the lexical head of the initial phrase suggest that this is semantic or pragmatic in nature, rather than (syntactically) arbitrary. For example, adverbs and prepositional phrases which

DENOTE or IMPLY a location require a verb which denotes (e.g. 12a), entails (e.g. 12b), or implies (e.g. 12c) being at a location.

- 12a. In the garden had been a bust of Lenin.
- 12b. On the beach lay/slept/??dreamed a malnourished vagrant.
- 12c. In the room paced/*dashed three angry officers.

Likewise, adverbs and prepositional phrases which denote or imply a goal or direction of action require a verb which denotes motion from one point to another (e.g. 13).

- 13. Onto the rug scurried/*stood a little gray mouse.

(For discussion of how the selectional restrictions governing these co-occurrences are best stated, see Green (1984b)).

The fact that the subject inverts past any auxiliary verbs, to the right of the main verb suggests (especially when auxiliaries are treated as a subclass of verb) that this is an unbounded dependency, and indeed this is the case.³ All of the inversions in (1) occur in long distance dependencies of the sort illustrated in (14a,b). In general, these sound much better when the main verb is be than when it is a more descriptive word (14c), and the colloquiality of certain constructions (e.g. (1C)) clashes with the relative formality of many "Raising" predicates (14d).

- 14a. In the garden appeared to be a unicorn.
- 14b. To each VP rule continues to appear to correspond an S rule with exactly the same right-hand side, plus an extra NP.
- 14c. Leaning against the wall seemed to be/?*slouch an old man in ragged and dirty clothes.
- 14d. ??Up/??Away seemed to float the giant, tomato-shaped balloon.

By way of contrast, the auxiliary inversions in no way select for particular classes of verbs; the choice of main verb is entirely free. In addition, but not surprisingly, there is no long-distance dependency involving the subject: the subject goes after exactly the first auxiliary verb, and it must be do if no other is provided. This is illustrated in (15).

- 15a. *Thus would have been leaving two of the stickiest thorns in the side of the director.
- 15b. Under no circumstances do you seem to be eligible.
- 15c. *Under no circumstances (do) seem to be you eligible.
- 15d. *Under no circumstances (do) seem you to be eligible.

1.4 Correlation with there-insertion

For the most part, V-inversions correspond to there-constructions, with or without an initial non-subject phrase. That is, for almost every inversion sentence of the form of (16a),

there is a there- sentence of the form of (16b) or (16c), or both, where C is in (A, P, V).

- 16a. CP ... V NP W
- 16b. CP there ... V NP W
- 16c. There ... V NP CP W

For quotation inversion, where C is (if anything) N, there are no corresponding there- constructions. We do not find sentences like (17).

- 17a. *There said Kim, "Yecch!"
- 17b. *"Yecch," there said Kim.

I do not believe that there are any there- constructions corresponding to any of the auxiliary constructions, i.e. examples like (18).

- 18a. *Never there had the fiddler been so happy.
- 18b. *Never there had been the fiddler so happy.
- 18c. *There had the fiddler in no place been so happy.
- 18d. *There had been the fiddler in no place so happy.

2.0 Extending existent analyses

2.1 Extending the slash-category analysis to cover all V-inversions

As is perhaps clear by now, the V-inversions in (1) have almost nothing in common beyond the relative order of subject and first V, with the auxiliary inversions in (2). V-inversions are lexically governed (cf. Green 1984b), while auxiliary inversions are ungoverned. V-inversions involve a dependency between the trigger phrase and the governing verb, while auxiliary inversions have no such dependency. V-inversions are unbounded in that a potentially indefinitely long string may appear between the trigger phrase and the governing verb, which immediately precedes the subject, while in auxiliary-inversions, the subject NP immediately follows the first auxiliary verb, which immediately follows the triggering phrase (if any). In auxiliary inversions, any triggering phrase is not dependent on the auxiliary inverted over, and in some cases, may come from several clauses down, as in Not a bite did Kim imagine that Sandy would eat. Finally, some auxiliary-inversions occur in the absence of a triggering constituent, while productive V-inversions seem to always have a syntactically realized triggering phrase. (When syntactic triggers are present, they are initial constituents for both types.) As the inversions that (4) appears to have been intended to account for seem to be (a subset of) the V-inversions, I will discuss in this section what it would take to extend the analysis they sketch in such a way as to treat all of them in roughly the same fashion. In Sec. 2.2 I discuss how the various auxiliary-inversions might be treated.

2.1.1 Correlation with there- constructions

The analysis sketched in GKPS (1982) and Sag and Klein (1982) exploits the rule which generates VPs for there- subjects, cited above as (5), to guarantee the presence of an NP directly after the verb. This rule actually must be formulated as (19) to guarantee correct agreement (Green 1984a).

19. VP[there] --> HO[SUBCAT 12, NUM \$], NP[NUM\$], X2[+PRD]4

This rule sanctions such VPs as those in (20).

20a. be a man in the garden

20b. is a unicorn standing over there

20c. are some people taller than me

Now, improved as this formulation is, it still only generates inversions over be; it will not sanction such sentences as (21), despite the implication in GKPS (1982) that it will, for the simple reason that V[SUBCAT 12] is limited to be.

21. In the garden sat a unicorn.

If we just let the membership of V[SUBCAT 12] be a larger set, containing, e.g., sit, run, stand, lay, crawl, etc., then the rule in (19) will sanction the sentences that rule 5 was apparently intended for, and in addition, quite a few more, including (1B) and (1E). We would need to include so-called verbs of saying in this class to generate Quotation inversions like (1J), and generalize the rule in (4) to cover initial NPs⁵ (if that is what quoted speech is, syntactically), but this is surely ill-advised. First of all, including these verbs in V[SUBCAT 12] incorrectly predicts the existence of sentences like (17a). Second, using syntactic means to ensure that the semantic object of the verb of saying is an NP which represents speech, to prevent sentences like (22a,b) or even (22c), requires the syntax to duplicate independently necessary semantic or pragmatic principles.

22a. *There said Leslie a unicorn.

22b. *Some unicorns says Leslie.

22c. *Some questions asked Leslie.

Since quotation inversions are significantly different from other V-inversions in other ways (they allow no preverbal auxiliaries, for instance), I will assume that they are described by a different set of rules, perhaps something on the order of (23), where p+ is a regular expression over the set of discriminable phonetic segments, or something like that.

23a. VP --> H, p+

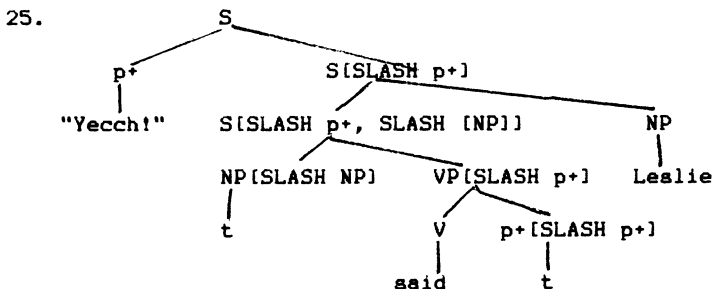
23b. S --> p+, S/p+

This claims, contra Partee (1973), that the quoted material has no

part of speech, which may be correct, but it would seem to pose problems for LP rules and probably for the semantics to "mix levels" in this way. Possibly one could get around this by replacing p^+ with NP and a feature [PHONETIC], though this seems ad hoc. This sort of treatment also poses problems for guaranteeing linear order, as we can get the forms in (24a-d), but not those in (24e-f).

- 24a. NP V p^+
 24b. p^+ V NP
 24c. p^+ NP V
 24d. V NP p^+
 24e. *V p^+ NP
 24f. *NP p^+ V

Even with the rules in (23) and an LP rule requiring NPs to precede "phonetic material", we will still fail to get (24b), because of the English LP rule that says that lexical items precede phrasal sisters. Indeed, the only analysis I can imagine that is consistent with these rules is the one sketched in (25), and it contains two dubious novelties: rightward topicalization,⁶ and doubly-slashed categories. While there are reasons to suppose that multiply-slashed categories need to be available as a theoretical option (Maling and Zaenen 1982), there are problems with the sort of rightward dependency rule one would need to generate a tree like (25).



Among them are the fact that it requires postposing subjects, though subjects ordinarily cannot postpose. It will not do to say that NPs follow slashed sisters, because this is not generally true--just the opposite is true of ordinary topicalization. In addition, it would predict such sentences as What did you [promise [that you would bring back t from the library] Bill]? I will not attempt to resolve these issues here, and suppose merely that some satisfactory treatment of this common but entirely literary construction can be found.

In fact, we can generate even more of the V-inversions if we can revise the inversion rule in (4) a bit more, to something like (26), generalizing from PP-initial sentences to V2-initial and

AP-initial as well.

26. S --> X2[+PRD], VP[there]/X2⁷

The category V2[+PRD] will have to be restricted to a participial form, or sentences like (27) will be sanctioned as well.

27. *Stack in the corner lay 12 issues of Playboy.

When V[SUBCAT 12] was just (be), this was not too much of a problem, because rules already stipulated (Gazdar, Pullum, and Sag 1982:608) that when be was generated as head of a VP consisting of H and VP, the VP daughter was [PRP] or [PAS]. However, that still wouldn't get even the participial inversions with be correctly, because a VP[PAS] will optionally have an agent phrase, and these inversions are unacceptable with agent phrases, as in (28).

28a. *Stacked in the corner by Sandy were 12 issues of Playboy.

28b. *Hidden amongst the ferns by some means was Garfield.

A possible solution to both problems is to say that the participial phrases in (1G,H) are not merely VP, but also AP, but it is not clear what would motivate a rule like (29).

29. AP --> VP[@] where @ (([PRP], [PSP])

In any case, it is reasonable to ask at this juncture if there are any untoward consequences to tying inversion to there-constructions as this analysis does. It has been suggested (Postal (1977), Hankamer (1977)) that there is a one-to-one correspondence between inversion and there-insertion, and many accounts seem to assume that this is the case. In fact, however, the full paradigm of there-initial sentences, there-second sentences, and there-less inversions, as described above, has a number of gaps. The there-second constructions like (16b) and (30) would be sanctioned by the topicalization rule schema in (31) instantiated on a S with a there subject, and should occur for every there-initial sort of sentence, as should the inversions sanctioned by rules in (19) and (26).

30. Into the garden there (may have) galloped a silver unicorn.

31. S --> CP, S/CP (Topicalization rule schema)

The worst problem for the there/ Inversion connection is cases like (32a). These have no there counterparts whatever.

32a. Into the game now is the fullback Jenkins.

32b. *There is the fullback Jenkins/a halfback I don't recognize into the game.

32c. *There is into the game the fullback Jenkins.

32d. *Into the game there is the fullback Jenkins.

32e. *Into the game is there the fullback Jenkins.

If (26) can be generalized to include initial adverbs as well as PPs, the problem arises again: the directional adverb inversions have a paradigm similar to (32): none of the there construction sounds at all acceptable.

33a. Here comes the bus.

33b. *There comes the bus here.

33c. *There comes here the bus (to Santa Monica Beach).

33d. *Here there comes the bus (to Santa Monica Beach).

34a. Up went the balloon.

34b. *There went the balloon up.

34c. *There went up the balloon (that we spent all our money on).

34d. *Up there went the balloon (that we spent all our money on).

Since trying to use a there-VP rule to generate these inversions would predict such ungrammatical sentences as (33b-d, 34b-d), one might try to account for the constructions in (32a, 33a, 34a) with an independent S-level rule like (35) (since with a lexical S-rule one could never get the PP to precede the verb--besides the "verb" is really an intransitive VP with all of its auxiliaries and non-preposed complements, as indicated in (1C, 1F, 30)). Not only would this grossly overgenerate, yielding such lovelies as (36), it would provide no way of ensuring that the VP consist of V, NP, and an optional predicative phrase; one would also get sentences like (37).

35. S --> XP[+PRD], VP

36a. *Proud of her father ran Kim.

36b. *Up kicked Sandy into the pool.

37a. *Into the garden arrived.

37b. *Here ran into the room.

In other words, it would exponentially compound the subcategorization problem (not discussed here, cf. Green (1984b)) that arises when (5) is generalized to include verbs other than be.

Other directional constructions, like (38a), with different main verbs occur with there second (38d), but not with there initial, unless the PP adjunct precedes the NP (38b,c).

38a. Into the garden ran Kim/the cat/an orange cat.

38b. *There ran Kim/the cat/an orange cat into the garden.

38c. There ran into the garden *Kim/*the cat/??the orange cat/an orange cat.

38d. Into the garden there ran *Kim/*the cat/??the orange cat/an orange cat.

If it is some correlate of the heavy NP shift phenomenon that accounts for this distribution, indefiniteness counts as very heavy. Since in better-established cases of that phenomenon, indefiniteness is not particularly important (38e), it seems unlikely that the distribution in (38) involves the "Heavy NP Shift" phenomenon.

38e. They attributed to arson ?*a fire/?*the fire/a fire which destroyed 20,000 acres of timber yesterday/the fire which destroyed 20,000 acres of timber yesterday.

There are even fewer there counterparts to AP inversions like (39a):

39a. Extremely angry about the increase are the/some residents of Marin County.

39b. There are ?some/*the residents extremely angry about the increase.

39c. *There are extremely angry about the increase some/the residents of Marin County.

39d. *Extremely angry about the increase there are some/the residents of Marin County.

The participle inversions with main verbs other than be are like the inversions in (38) in sounding better with the NP in final position, as if it were "heavy", but again, indefiniteness seems to count more than length in constituting "heaviness".

40a. Leaning against the wall stood the/a raggedy old man.

40b. Leaning against the wall stood Sandy.

40c. There stood *the/??a raggedy old man leaning against the wall.

40d. There stood leaning against the wall ?*the/a raggedy old man.

40e. Leaning against the wall there stood *Sandy/the raggedy old man/a raggedy old man.

41a. Galloping down the street came Trigger.

41b. Galloping down the street came the/a riderless horse.

41c. There came *the/??a riderless horse galloping down the street.

41d. There came galloping down the street *Trigger/??the riderless horse/a riderless horse.

41e. Galloping down the street there came *Trigger/??the riderless horse/a riderless horse.

42a. Stacked against the wall stood the/a pile (of old comic books).

42b. There stood *the/??a pile (of old comic books) stacked against the wall.

42c. There stood stacked against the wall *a pile/??the pile of old comic books/a pile of old comic books.

42d. Stacked against the wall there stood *a pile/??the pile of old comic books/a pile of old comic books.

In all of these cases indefiniteness makes a difference only in cases where there shows up. Where there is no there, it makes no difference. This suggests that the there-connection is spurious. Although Aissen (1975) shows that a "presentational" there construction admits definite post-posed subjects with a wide range of verbs (just like inversions), those definites do seem to have to be genuinely heavy, as shown in (43).

43. There hung on the wall ?*the picture/the picture of Marx that Lenin had commissioned from Cezanne.

What the examples in (32-43) show, then, is that exploiting there-VPs to generate (certain) V-inversions entails either overgenerating there-sentences, or failing to generate large classes of V-inversions, namely those with a definite NP immediately after the verb, and maybe all of those with main verbs other than be.

There is one thing that tying inversions to (19) and (26) buys, though, if the instantiations of X2 exclude NP, and that is that it automatically excludes transitive constructions such as (44).

44a. *A race ran Kim and Sandy.

44b. *Into the garden ran a race Kim and Sandy.

44c. *Into the garden ran Kim and Sandy a race.

The inversion verb will have only one NP sister if it is sanctioned by (19). However, if V[SUBCAT 12] includes crawl, sleep etc., as it would have to, under this analysis, to get inversions like (1A, B), and the topicalized X2 can be NP, we will get word salad like (45) in addition to unacceptable VPs like *be a man a lawyer, and the semantic account of the unacceptability of *be a man a lawyer does not generalize in any obvious way to examples like (45).

45a. *sleep Lee a backpack.

45b. *crawl a toddler the worm.

Thus it seems that little is gained by deriving V-inversions by means of the rule that admits VPs for there-subjects.

2.2. Extending the metarule analysis to all aux-inversions

The metarule in (7), intended to describe English yes-no questions, allows auxiliary-initial inversions. If one overlooks a few differences in pre-(main)verbal adverbials,⁸ this metarule could do double duty for exclamatory inversions like Ia that easy! Negative inversions. Negative inversions like (2M) could be derived by a similar metarule along the lines of (46)

46. V1 --> W ==> S[INV, NEG] --> W, NP[INDEF ...]

If such constructions require the inverted subject to be some kind

of quantified indefinite (as an acceptability pattern like that in (47) suggests), then formulating the metarule along the lines of (7b), as in (46), would seem to be necessary, as a formulation like (7a) would not allow reference to the subject.

- 47a. Don't no dude mess with Monty.
 47b. *Don't that dude mess with Monty.
 47c. Can't many dudes ride that horse.
 47d. *Can't some dudes ride that horse.
 47e. Can't three dudes in the entire state of Texas ride that horse.
 47f. Can't three dudes ride that horse.
 [* if three = 'exactly 3']
 [OK if three = 'even 3']

A metarule-induced rule sanctioning V and S as sisters under S (as in (7a)) would not allow specification of the features of the subject of the embedded S. On the other hand, if, as seems likely, sentences that are unacceptable are excluded on the semantic (or pragmatic) grounds that the negative-polarity subject NPs are existentials with narrow scope with respect to negation (cf. Ladusaw 1979), then either sort of metarule would do. As I am unfamiliar with the details of the syntax of this construction I won't explore it further.

Conditional inversions. It might seem that the simplest way to account for the cross-clause modal verb dependencies in conditional inversions (exemplified in (48-49)) would be by a metarule from uninverted if...then constructions.

- 48a. Were we in Boston, we could go to Fenway Park.
 48b. Had I been in Boston, I would have visited them.
 48c. Should he leave, you can have his room.
 48d. You can have his room, should he leave.
 49a. *Had he left, you can have his room.
 49b. *Should he leave, you could have replaced him.

Although I have no idea how the latter might be derived, we may suppose that it is by a rule something like (50). If so, the metarule in (51) might be a candidate.⁹

50. S --> S[if, @], S[\$]
 where either @ ({had, could, would}), and \$ ({would, could, should})
 or @ ({could, were}) and \$ ({would, could, should, might})
 or @ ({should, did}) and \$ ({will, may, can, could, must})

51. S --> S[if, @], S[\$] ==> S --> S[INV, @], S[\$]

However, there are some problems. The inverted clause cannot begin with a (contracted) negative auxiliary. Specifying the S[INV] as [-NEG] will correctly predict the unacceptability of (52a) and the acceptability of (52b), since the Head Feature Convention will project it onto the head V, not the complement VP.

52a. *Hadr't we been there, it would have been difficult for them.

52b. Had we not been there, it would have been difficult for them.

Since not all uninverted conditionals correspond to inverted conditionals, some auxiliaries would have to be excluded entirely. For example, will, was, can do not occur in the inverted conditional antecedent, even though there are non-counterfactual conditionals (e.g. (48c,d)). Finally, since the sets of auxiliaries involved in the dependencies ((had, could, were), (would, could, might); (should), (will, may, can)) do not appear to be specifiable in a natural way, it is not clear how @ and \$ in (50) and (51) could be specified. Something closer to the yes-no question metarule in (7a), along the lines of (53), runs into the same problems in excluding negatives, and accounting for the modal-modal dependencies, and furthermore entails a rather unlikely constituent structure.

53. V1[AUX,FIN] --> W ==> S[INV] --> H[@], S, S[\$]

In addition, while (51) correctly predicts that the order of clauses in conditional inversions is free (cf. 48d), getting the linear order of clauses right with LP rules would seem to require ad hoc diacritics if these inversions are induced by a rule like (53). Thus, the metarule in (51), which is impossible according to the current theory, is empirically superior to that in (53), the most likely candidate allowed by the theory. Nonetheless, I should point out that the metarule in (51) is prohibited by the constraint that metarules only refer to rules which specify lexical heads.

Negative phrase initial inversions. We might try to add an initial "trigger" phrase to the yes-no question rule (7a), to account for the inversions with initial negative phrases like (2N), but in fact, all we really need is an ID-rule like the scheme in (54), which like the output of the metarule in (51), EXPLOITS the fact that the SAI metarule defines a category S[INV], which, it turns out, can dominate an auxiliary verb and its complement.

54. S --> C[NEG], S[INV]/C[NEG]

Having this rule be a slash-introducing rule like the topicalization rule is necessary to get the semantics correct--most obviously where the initial phrase is an argument, as in (55).

55a. Not a bite did Sandy eat.

55b. To no one did Lee give any books.

It also correctly predicts that the trigger-gap relationship is an unbounded dependency, as shown by examples like (56).

56. Not a word did Kim imagine Sandy would say [t].

Notice that since such inversions must involve slashed categories, we could not generate sentences like (55) with a metarule like (7b); given an input and an output with VARIABLES OVER SETS of categories, it is not determined where the slash would go, or even if you could specify a slash at all. Supposing that one could write a metarule of the form (54'), where W/C would be interpreted as 'a collection of categories such that one of them has the value C as a coefficient of [SLASH],' this would not allow all of the necessary Cs to be specified.

54'. V1 --> W ==> S[INV] --> C, W/C, NP

The reason is that the formulation in (7b), from which (54') is derived, takes advantage of the fact that, if we follow the analysis in Gazdar, Pullum, and Sag (1982)¹⁰, all of the auxiliary verbs are generated as the head of a rule of the form V1 --> V, V1. This means that W in (7b) or (54') is an abbreviation for sets of sets of the form {V[@], V1[!]}]. Since lexical categories cannot usefully have the feature [SLASH], this leaves V1 as the only category which could carry the [SLASH]. However, the most characteristic value of C in these constructions is PP or Adv, and most of these attach to V2[-SUBJ] (predicate phrases), not V1 (verb phrases); since V1 does not have V2 as a daughter, there would be no place to get PP or Adv gaps from in this analysis. Under the analysis in (54), where it is S (equivalently, V2[-SUBJ]) that is specified as having the feature [SLASH], or where adjuncts of this sort are all daughters of V1, this is not a problem.

However, the formulation in (54) raises a number of issues. First of all, there is the problem of specifying the range of C. It includes NP as in (55a), PP as in (55b), lexical adverbs as in (57a), phrasal adverbs as in (57b), clausal adverbs as in (58), conjunctions as in (59a), and AP if sentences like (59b) are acceptable.

57a. Never/Rarely/Seldom have I seen so many kinds of tofu in one place.

57b. Hardly ever did Lee and Hilary speak of their college days.

58a. Hardly had the man come in when the woman left again.

58b. No sooner had they settled themselves than the phone began to ring again.

58c. Not until Kim had finished did Leslie begin to object.

59a. Nor/Neither do we charge three and sixpence for it.

59b. Unafraid to ski had Kim been, but the opportunity never arose.

This is not an easily specified class, but then it is not obvious that all of these inversions should be sanctioned by a single principle.

Second, if the initial "trigger" is to be characterized as

[+NEG], [NEG] will have to be a foot feature: it is manifested morphologically on the NP in a PP, not on the preposition (as in (55b)), so the HFC will not suffice to guarantee its presence in the correct place. Presumably, a rule such as (60) would suffice to allow such phrases as those in (61) to initiate these inversions as well, while such adverbs as seldom, rarely would just have to be marked lexically with [NEG].

60. X2[+NEG] --> not X2[-NEG]^{11,12}
 61a. Not under any circumstances
 61b. Not a page/bite/word/drink etc.

Further specifications are probably necessary to limit NPs in this construction to indefinites, unless semantic or pragmatic principles will exclude examples like (62a). Definites are (possibly) acceptable only with a following explicitly contrastive phrase (cf. Horn 1985).

- 62a. *Not the page did he read.
 62b. ?Not the play did he see, but the movie.
 62c. *The play did he see, but not the movie.

There are alternative analyses of these "negative" inversion triggers, which treat the inversion-licensing negatives as identical to the set of polarity-licensing negatives. But these fail to explain why inversions are not licensed in some contexts where negative polarity items are, and why inversions and negative polarity items embed under different conditions. The inversion licenses are a subset of the negative polarity licenses: constituents containing not, no, never, rarely, seldom, hardly, barely, and only license both kinds of construction. These inversion licenses might in fact be characterizable by a real morpho-syntactic feature, in a way that the larger class of negative polarity licenses is not.

Positive frequency and degree adverbials. Presumably the rule for inversions such as those in (20) would be very similar to that for Negative-phrase inversion, as in (54), except that there would be no [NEG] and C would range over just adverbs and adverbial phrases--cf. (63).

63. Many a moonlight night have I murmured it to the nightingales which haunt the gardens of St. Johns.

Whether C would have to be specified to include only frequency adverbials is not clear. This is a very infrequent construction to begin with, and if sentences like (64), with manner and degree adverbs, are only more infrequent, and thus pragmatically disfavored, rather than being really ungrammatical, we do not want the grammar to exclude them.

- 64a. Wistfully did she commend to us those little Italian places...

64b. Enough had she listened to warped and scratched monaural discs from the 1960s.

Of course we do want the grammar to exclude sentence adverbs like obviously, perhaps, unfortunately (65), and adjective- and adverb-modifying adverbs like very, extremely, too, but distinguishing among adverbs in this way is one more thing the grammar will have to do anyway.

65. *(Un)fortunately did the committee reject our offer.

Comparative extent-result inversions. I turn now to inversions like (2R). Here again a topicalization-like rule will be necessary to get the grammatical relations correct in the semantics. Given that the monoclausal inversions are interpreted as anaphoric versions of the cataphoric biclausal inversions like (2S), it is quite appropriate to describe them by means of an optional clausal constituent, as in (66).

66. S --> XP[is], S[INV]/XP[is], (S[COMP that])

Here XP must range over NP, PP, AP, Adv of whatever level phrases like so carefully are, and whatever category such belongs to in sentences like (67) (probably NP).

67. Such is the impact of work on some people.

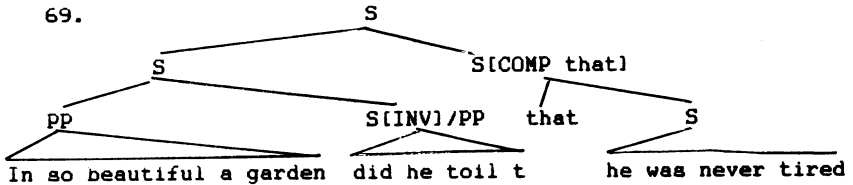
Of course, not all topicalized NPs, PPs etc. co-occur with inverted clauses, only negative ones and ones with so or such. This means that XP must be further specified, in a foot-featurish manner similar to that seen to be necessary for negative-phrase-initial inversions--again the "so"-morphology shows up on the NP in a PP, not on the preposition.

68a. In such peaceful circumstances did he labor that ...

68b. In so beautiful a garden did he toil that he never was tired.

It would seem that the fact that the that- clause is a result clause would have to be stipulated, or made to follow from some sort of meaning postulate dependent on the semantics of the "so"-constituent.

The constituent structure implied in (66) is almost certainly not correct; the that- clause, though logically connected with the so- phrase, appears to be a sister of the rest of the sentence, as in (69).



Furthermore, neither (66), nor the rules implied in (69) correctly predicts the phrase order; (66) allows (70a), and (69) allows (70b), as well as the correct (68b).

70a. *In so beautiful a garden that he was never tired did he toil.

70b. *That he was never tired in so beautiful a garden did he toil.

The deictic constructions like (2S) are quite similar, but do not have a second clause, so substituting DEM(onstrative) for SO in (66) would predict impossible sentences like (71).

71. *Thus does he introduce her anecdotes that she bores everyone unmercifully.

An ID-rule like (72) would probably suffice.

72. S --> XP[DEM], S[INV]/XP[DEM]

The feature [DEM], to be realized in thus, this, that, etc., would have to be, like ["SO"] and [NEG], and for the same reasons, a foot feature.

Additive inversions. The last inversion whose analysis I will discuss here is that exemplified by such sentences as (2T). One could do their syntax simply enough, treating so as a syncategorematic element with a rule like (73), if the semantics didn't have to be predicted from the syntax.

73. S --> so, H2[INV]/V2[@] where @ is not [VFORM FIN]

However, although the [SLASH V2[@]] will ultimately beget a V2[+NULL], from which an interpretation of this constituent as VP-elliptical can be derived (cf. Klein 1984), such a rule will generate what amounts to an unbound trace. This could be remedied if the constituent which leaves out as so could be justifiably characterized as a V2[@], perhaps with some diacritic such as [+PRO], which would have this effect, as in (74).¹³

74. S --> V2[@ +PRO], H2[INV]/V2[@] where @ is not [VFORM FIN]

It is not obvious how the additive meaning of such sentences

could be predicted within the Klein and Sag (1982) theory of rule translation, but it could be stipulated, or, as it is not truth-conditional, dealt with in a linguistic pragmatics (cf. Green 1982).¹⁴

Insofar as both [V2 S] and [S V2] are allowable orders, both sentences like (75a) and (75b) will be derived.

75a. So [is Kim].

75b. *[Is Kim] so.

I know of no other cases where V2 and S are sisters, so perhaps an LP rule that says that V2s precede their S sisters will suffice.

2.3 Linear order

The LP rules in (76) (cf. Gazdar and Pullum (1982)) go a good part of the way towards correctly specifying the order of elements in English phrases. However, since V1 isn't ordered with respect to PP, V2, AP, or Adv with any number of bars, they allow the constituents in the V-inversions, as analyzed above, to show up in more than one order, as listed in (76).

76a. lexical category < NP < PP < S

76b. NP < V1

77a. V2 v1 [V NP] Slouching in the corner was/stood a young man.

77b. [V NP]v1 V2 *Stood a young man slouching in the corner.

77c. PP v1 [V NP] Into the room ran a young man.

77d. [V NP]v1 PP *Ran a young man into the room.

77e. AP v1 [V NP] More significant is what you don't say.

77f. [V NP]v1 AP *Is what you don't say more significant.

77g. Adv v1 [V NP] Here comes the bus.

77h. [V NP]v1 Adv *Comes the bus here.

The (b,d,f,h) examples are clearly incorrect as inversions. (It is also worth noting that unacceptable examples (77b,d,f) are predicted to be the only correct forms by theories which treat the postcopular material in constructions like (20) as a single NP constituent (e.g. Williams 1984, GKPS 1984).) Thus, the rules in (76) fail to guarantee that the inversion "trigger" be initial in inversions. We cannot add the LP rules in (78), because within V2s, V1s ordinarily precede PPs and VP adverbials, as shown in (79).

78a. V2 < V1

78b. P2 < V1

78c. A2 < V1

78d. Adv < V1

79a. The bottom fell out of the stock market in 1929.

79b. *The bottom in 1929 fell out of the stock market.

79c. *The bottom because everybody was buying on margin fell out of the stock market.

Furthermore, liberating the contents of VP/XP into S (cf.

Pullum 1982) is no solution, as XP, whatever its instantiation, would have to follow V, and thus could not be initial.¹⁵ It is possible to engineer a solution without abandoning the claims of ID/LP format, but it involves taking advantage of the absence of limitations on possible features, and admitting such a solution does gut the ID/LP claims of empirical content. One could postulate a feature--call it [FIRST] so as to have no illusions about its ad hoc nature--that the inversion rules (e.g. (26)) assign to the trigger XP. Then an LP rule like (80) will guarantee that the XP will precede its V1/XP sister.

80. [FIRST] < V1

Assuming that [FIRST] is a head feature, it will be harmlessly passed down by the Head Feature Convention (harmlessly since XP will never have any V1 daughters that Head daughters would incorrectly have to precede).

What about the auxiliary inversions? The ID-rules sketched as candidates for the inversions in (2K, 2M-T) are rules which license S_a consisting of a predicative phrase and an inverted sentence with a predicative phrase gap. This retains the slash (topicalization) analysis of the trigger phrase, and so preserves the prediction that the trigger-gap relation is an unbounded dependency, as shown in examples like (56) above, and (81) here.

81. So calmly did we believe that they would take the news [t] (that ...).

Having the mother unmarked for inversion will allow these to be embedded freely (cf. Green 1976), and require them to be rated unacceptable in some environments on pragmatic grounds rather than ruled ungrammatical. Marking the daughter S/C as bearing [INV] allows the output of the yes-no metarule itself to do the work of inversion in expanding S[INV]/C. That same marking will not generate incorrect contracted auxiliaries in sentences like (82) if [-NEG] or a FCR will suffice to ensure that the head of S/@ will get the negative value for [NEG].

82. Thus *aren't I/am I not absolved from responsibility for such events.

If the trigger is a PP or NP, it will now only precede the S/@, as desired, according to (76). However, if @ is some kind of adverb or adverbial, no order can be specified by an LP rule, because adverbial sisters of S must be free with respect to S, in light of sentences like (83).

83a. Slowly Lee walked home.

83b. Lee walked home slowly.

83c. Unfortunately, Lee is absent.

83d. Lee is absent, unfortunately.

The only way out of this that I can see involves saying 1) that adverbs like never, thus, in no way, rarely, barely belong to a different category, say QAdv, from sentence adverbs like unfortunately, maybe, perhaps, no doubt, slowly, and 2) that QAdv is free with respect to its sister VP, and Adv is free with respect to its sister S, but QAdv precedes S. Maybe this will work.

Additional problems remain for the additive so inversions, even if the analysis in (74) derives the correct linear order. The problem is that the scheme in (74) indicates an unbounded dependency, which is correct for subject-auxiliary inversions of the other seven triggered types, but which is not correct for this so. While we find such sentences as (56), we do not find such sentences as (85).

56. Not a word did Kim imagine Sandy would say t.

85a. *So does Kim think Dana (did).

85b. *(Sandy likes apples, and) so does Kim think that Jo may.

Actually, there is a further complication here. The examples which best show the unbounded nature of the dependency between the initial XP and the post-auxiliary S involve intervening main verbs of the class involved in the negative-raising phenomenon (cf. Green 1974). Thus, the examples of (56), (81), and (86) are better than those of (87).

86. Thus_i did we want the boys to confound their leader's plans t_i.

87a. ?Not a word did Kim regret that Sandy said t.¹⁶

87b. ?So calmly_i did we announce that they would take the news t_i (that Kim was utterly unprepared for the joyous scene that followed).

87c. ?Thus_i did we force the boys to confound their leader's plans t_i.

Interestingly, it is possible for the negative in negative-NP-initial inversions to be semantically local to the embedding verb, while the rest of the NP is embedded below it, as in examples like (88).¹⁷

88a. Not a bite did Kim ONEG admit/record that Sandy ate [t]_{NP}.

88b. Not a bite did Kim ONEG order/observe them to eat [t]_{NP}.

This poses an interesting challenge for the semantic analysis of these constructions.

3.0 Conclusions

I have showed that while it is possible to generalize the

rules in (4) and (5) to one like (26), and so describe all of the V-inversions in (1A-11), to do so predicts the existence of there-initial sentences which do not occur, such as those in (32-34, 38-42). Some of the unacceptability seems to hinge on referential properties, e.g. definiteness, and perhaps a pragmatic rule for the use of these constructions could allow us to say that unacceptable examples like those in (38-42) are grammatical but pragmatically contradictory or pointless. Other examples, like those in (32-34) are ungrammatical for all sorts of NPs. The proper analysis of these constructions in GPSG (in any theory, probably) remains very unclear. It should be noted that two of them (those in (33) and (34)) are constructions which occur frequently in natural speech, and the other (in (32)) is one that most of us don't use, but which sportscasters couldn't do without.

Because the quotation inversion in (1J) has markedly different properties, and no correlation at all with there-constructions, it is more appropriately described with a separate rule, or set of rules. In either case, the account may well involve constituents of a novel sort.

With respect to auxiliary inversions, I have shown that the gross properties of exclamations like (2K), and negative sentences like (2M) are already accounted for by the SAI metarule, while conditional inversions like (2L) appear to require a new metarule, and the inversions with overt initial "triggers" (2N-2T) can be accounted for with topicalization-like ID-rules which exploit the output of the SAI metarule.

I have sketched a number of obstacles to generalizing proposed treatments of inversions (chief among them: imperfect correspondences between inversions and their uninverted counterparts, and the description of the linear order of phrases). I have suggested possible directions for the resolution of some issues. The proposals have been of several sorts: additional features, additional metarules, construction-specific ID-rules, and pragmatic acceptability-demotion in lieu of syntactic expulsion. But even these proposals are not entirely unproblematical. For example, two of the proposals require current constraints on possible grammars to be relaxed--constraints on the domain of metarules, and constraints on multiple values for [SLASH]. Furthermore, in several cases, allowed constituent orders pose problems for the ECPO condition implicit in ID-LP grammars.

But if I have failed to provide a completely adequate description of inversions within the constraints of GPSG, I expect that by sketching some of the systematic properties of inversions, I have made clear the danger inherent in building elegant, explanatory theories on the foundation of a few facts about a common construction, without attempting to see if those theories are consistent with facts about systematically similar (and less mundane, but hardly exotic) constructions. I have in mind the fact that linguists have been willing to devise theories of grammar--frameworks for description--which boast of having as natural consequences the (counterfactual) claims that inversion and topicalization do not co-occur (Safir 1982:438), that

inversions never embed (Emonds 1976; Safir 1982:451,460), and that negative NPs occur only in initial position (Williams 1984). In fact, some topicalizations (e.g. 2N, 2O, 2P, 2T) require inversion (as Safir's own examples indicate (Safir 1982:459). Most inversions embed in at least some contexts; a smattering of collected examples is given in (89).

- 89a. I'm always afraid that out of the blue is gonna come a bolt of lightning. (TV program, Rhoda)
- 89b. I have found out, from its pages, that never once have I been right. (Dorothy Parker)
- 89c. So he was settin' there, tellin' this bartender how heartbreakin' it was to be a manager of circus clowns, when up pops this Pearl du Monville outa nowhere. (S. J. Perelman)
- 89d. ...while on the window-silla of the houses stood wooden boxes containing moss-rose plants and terra cotta pots in which grew a breed of geranium whose spread of intensely red blossoms accented the prevailing pink tint of the rose-clad house-front like an explosion of flame. (Mark Twain)
- 89e. Miss Estelle Winwood, as Tweeny, gave a performance such as would cause your fourteen-year-old sister to be blackballed from the high school dramatic club, did she attempt to emulate it. (Dorothy Parker)

And negative NPs occur in object position as well as topicalized and in subject position, as in the verse in (90) from "The Night Before Christmas".

90. He spoke not a word, but went straight to his work...

At the very least, the data sketched here (and elaborated in Green (ms.)), represent large, systematic sets of constructions which any respectable theory of syntax must be able to account for in some way more satisfactory than dismissing them as marginal or stylistic (cf. Safir 1982:459) when exemplars are noted which contradict the theory.

Footnotes

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1. GKPS (1984) assumes a different analysis, in which the NP and its XP complement form a single syntactic constituent (a NP).

2. Example (11k) is perfectly acceptable where so means 'therefore' or 'likewise', but not where it means 'also'.

3. In the analysis of GKPS (1984), where the XP is a part of the NP, not a sister to it, an analysis as an unbounded dependency construction is unavoidable.

4. The symbols @ and § represent lower case alpha and beta respectively. Evidence that would motivate person agreement in there-insertion constructions and corresponding V-inversions is murky, largely because of the (probably grammatical and not phonological (cf. Green 1980)) infelicity of the pronoun-final inversions that show whether person-agreement occurs.

ia. ?*In the garden am I.

ib. In the garden is me.

However, other be inversions do require person agreement:

ii. Able am/*is I to go, and willing.

5. Thus adopting the analysis of Partee (1973). I am in basic agreement with her general conclusion, though some of the arguments are flawed.

6. There is a treatment of rightward dependencies as extraction in Gazdar (1981). However, it is phrased in terms of CF-PSG rules, not ID-rules, getting the rightward extraposition "for free". This is not possible with ID-rules and LP statements, and would require an ad hoc feature (e.g. [TOP]) to distinguish between phrases from which a constituent is topicalized (to the left), and phrases from which a constituent is extraposed (to the right). It seems to me that features of this sort make a mockery of the restrictive claims of ID/LP grammars.

7. Making the topicalized constituent the vague category X2 correctly predicts that predicative phrases can be conjoined in this position (cf. Sag, Wasow, Gazdar, and Weisler 1985):

i. On top of the world, and feeling fine, but angry about public apathy is Lewisville disc jockey, Kim Stacee.

8. Indeed, ever seems to be a positional variant of intensifiers like sure, really which never occur in inverted exclamations:

i. He sure/really/*ever can swim fast!

ii. Can he ever/*sure/*really swim fast!

Some of the strings that are asterisked in (ii) are acceptable, and can even be interpreted as being intended to convey assertions, but they have the intonation of echo-questions, and the declarative "force" is an implicature from questioning the act of questioning (cf. Sadock 1969).

9. The pattern in metarule (51) doesn't meet the restriction proposed in GKPS (1984) that the right-hand of the input rule consist of the variable W (a variable over multisets of

categories) and at most one additional category. Even if there were independent motivation for a feature [SFORM CONDL], allowing the pattern to be S[CONDL] --> W, this still wouldn't be a lexical rule, and there would be no way to incorporate a pattern of this form into a metarule like (S1), which needs to refer to the constituents of S[CONDL] to make the if-clause inverted and if-less.

10. The analysis in Sag and Klein (1982) seems to differ in treating there-insertion be as being the sister not of a V1[PRED], but of an N2 and an X2[PRED]. However, this would only help for there-insertion sentences, and leave no analysis for such sentences as (1).

1. Under no circumstances would he leave.

11. If (1) is OK (which I doubt), then the C2 in (60) should be an X2.

1. Not a bite, and not under any circumstances, would he eat.

12. Ladusaw (1982:18-19; cf. also Ladusaw 1979) assumes (following Klima (1964:313)) that the inversion-licensing NEG is not a syntactic feature, but the same polarity-licensing semantico-pragmatic feature as Klima's (1964) [Affect], and that inversion is predictable from the semantics. Observations about the structure of adverbial phrases like hardly ever, almost never would seem to support this. It is not at all clear to me what their syntactic structure is, and, for example, whether either has a head, and if so, whether the head stands in a constant precedence relation to its sister, but in any case, it seems to be the first adverb in the first phrase, and the second adverb in the other which bears the feature [NEG], whatever it turns out to be. How a generalization of the sort Ladusaw makes can be expressed in a GPSG where the semantics of a construction is not stipulated, but follows largely from general principles and type assignments is not clear either. However, perhaps one could do it through a special combinator f-INV. This would amount to saying that sentences like (1) were syntactically well-formed, but semantically incoherent, which is perhaps correct-- as Chomsky says, we have no privileged intuitions of grammaticality.

1. The bite did John eat.

On the other hand, the correlation between licensing negative-polarity items and licensing inversion in Klima's system was in some measure dependent on the particulars of that system, specifically, on ordered transformational rules, which have no counterpart in GPSG. Klima's inversion rule is triggered by an [Affect]-containing neg or wh constituent "in their original pre-sentential position" (1964:321), "where the constituent containing the feature Affect may have other constituents incorporated into it" (1964: 313). (This implies prior rules

incorporating constituents into neg and wh.) In any case, many [Affect]-containing constituents, which do license negative polarity items, do not license inversion:

- iia. I doubt that anyone ever said that.
- iib. I am surprised that anyone ever said that.

- iiia. *I doubt that did he (ever) say that.
- iiib. *I am surprised that did he (ever) say that.

Such non-correlations do not falsify Klima's claim of correlation because his was relativized to include only [Affect]-containing constituents in their original presentential position; in (ii) and (iii) the [Affect]-containing doubt and surprised are not in presentential position. Not surprisingly, moving them there does not help, as the [Affect]-containing items in (iv) do not c-command, or have in their (translations') scope, the inverted clauses.

- iva. *Doubting anyone would challenge the speaker did I leave.
- ivb. *Surprised that anyone would leave was Kim insulted.

In fact, even plausibly originally initial [Affect]-containing items do not license inversion:

- va. *Doubt (that) did anyone leave (if you're serious about being a detective).
- vb. *Doubt (that) did anyone leave, don't you. [With any stress or intonation]

In general, though, inversion is neither licensed (ii-iii) nor distributed like negative polarity items. Inversions do embed (vi), but in pragmatically more-or-less transparent clauses (cf. Green 1976), not neg or [Affect]-containing ones (vii).

- vi. I think that never has he really cleaned this room.

- viiia. *It's not true that has he picked up any of his toys.
- viiib. It's not true that he has picked up any of his toys.

Furthermore, it is well-known that negative polarity items may be licensed pragmatically (R. Lakoff 1969, Green 1981).

- viiiia. Do you want some/any spinach?
- viiiib. If you eat any candy, I'll spank/*kiss you. [assuming spanking is undesirable but kissing and candy are desirable]

But inversion requires an overt license; a sentence like (ix) is not an exclamation that the speaker has never been embarrassed to some implied degree.

ix. *Have I ever been so embarrassed.

Thus, the parallelism between so-called negative inversion and negative polarity items is only apparent.

I had thought that the inversion license had to be "local" to the inversion, and that sentences like (x) and (xi) were impossible.

x. I don't think that ever has he cleaned his room by himself.

xi. I don't think that anywhere is there a book as maddening as that one.

But I found they sort of grew on me, and in fact, one of the few inversions I have been able to collect from spontaneous speech in my presence reads as in (xii).

xii. I don't think that at any time did we get permission from the executive officer before the appellant's case was heard.

Another collected example:

xiii. Riley doubts that even then will the faculty favor bargaining unless faculty attitudes take a drastic turn. (Champaign-Urbana Courier 3-20-77)

13. If sentences like (i) are examples of this construction, then this inversion isn't an auxiliary-inversion like the others, because it allows more than one auxiliary verb before the subject NP, but not real main verbs (ii), and it will require another rule altogether.

i. So may have Sandy.

ii. *So slept Sandy.

14. This is on the assumption that the semantics to be provided is strictly a truth-conditional semantics.

15. Another possibility that won't work is to abandon the there-connection and generate V-inversions with a rule like (i).

i. S ---> X2, S[INV]/X2

The reason this won't work is that S[INV] induces inverted Ss, but only auxiliary inversions. Thus (i) would induce sentences like (ii), not sentences like (iii).

ii. *In the garden had a bust of Homer stood.

iii. In the garden had stood a bust of Homer.

16. There is an acceptable interpretation of this sentence, which construes the not with regret, and that Sandy said t as an

extraposed relative clause modifying word. I am concerned with the interpretation of (87a) which takes that Sandy said t as an object complement of regret.

17. This does not occur with other negative phrases. Never did I say that Kim had insulted Tracy does not mean 'I did not say that Kim had ever insulted Tracy,' and it is difficult, if not impossible, to get a sensible interpretation for sentences like With no pie do I want Kim to assault Dana.

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