

Lexical Categories and the Projection of Argument Structure

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0. Introduction¹

The Linguistic entity commonly referred to by means of the term “argument structure” is fundamentally a *syntactic* structure. At least, that is the viewpoint we have adopted in carrying out lexicological research based on the notion that syntax is projected from the lexicon, a notion which we believe to be at the very core of the Projection Principle, so central to the work currently being done in the theoretical framework to which we are most closely allied (cf. Chomsky 1981, 1986a). In this paper, we would like to be rather explicit about what we think argument structure actually is within our conception of the lexicon and the projection of syntactic structures.

The concept theta-role, or thematic role, holds a central position in current work on the theory of grammar. A verb is said, for example, to “assign” theta-roles to its (direct) arguments, and various formal representations have been proposed to express this relation (e.g., that developed by Stowell 1981). A number of scholars have noted that theta-roles are assigned in a manner which corresponds to a hierarchical organization, according to which certain arguments (associated with certain theta-roles) are “higher” than others (e.g., Bresnan and Kanerva 1989, Carrier-Duncan 1985, Grimshaw 1990, Larson 1988). While there is some disagreement as to what the hierarchical arrangement of theta-roles is in fact, particularly in the “middle” and “lower” ranges of the hierarchy, the results of very careful and detailed investigations on a number of languages converge to a remarkable degree. The hierarchy of roles set out by Grimshaw 1990, depicted in (1) below, exemplifies a system utilized in a fully worked-out theory of argument structure – other published hierarchies differ from this one in the positioning of the theme role (above GOAL, typically):

- (1) AGENT > EXPERIENCER > GOAL/SOURCE/LOCATION > THEME

(1) We wish to thank Morris Halle for very helpful criticism of this paper. And we are especially indebted to Mika Hoffman and Tova Rapoport for discussions of particular issues and problems which they have seen in the proposals being entertained here. Many of their ideas have been used here, though they are not to be held responsible for any conceptual or factual errors which remain. This paper is a revised version of the final section of a longer work, Hale and Keyser, 1991, distributed by the MIT Lexicon Project.

Among the observable correlates of the hierarchy, for example, is the association of thematic roles with the subject function in syntax (agent, otherwise experiencer, and so on). Moreover, assuming the correct hierarchy, the correlations are universal – that is, they conform to Baker’s “Uniformity of Theta Assignment Hypothesis” (UTAH), according to which, for any two natural languages, or for any two items within a single language:

- (2) Identical thematic relationships between items are represented by identical structural relationships between those items at the level of D-structure (Baker 1988: 46).

While we feel that the grammatical effects commonly attributed to the thematic hierarchy are genuine, we are not committed to the idea that the hierarchy itself has any status in the theory of grammar, as an autonomous linguistic system, that is. And we are sympathetic with the view (expressed by a number of scholars, often tacitly or indirectly) which questions the autonomous existence of theta-roles as well.

In what follows, we would like to address two questions which these matters suggest to us:

- (3) (a) Why are there so few thematic roles? (b) Why the UTAH?

The number of thematic roles suggested in the literature is rather small. And it seems to us correct that the inventory is so small. If so, why is it so? Why aren’t there twenty, or a hundred theta-roles? Surely if thematic roles exist, there could, in theory, be any learnable number of them. And why are thematic roles “assigned” according to a universal hierarchy and in conformity with the UTAH? Why isn’t the assignment random? Or, at least, why isn’t it as nearly random as would be allowed by limitations relating to learnability? This is the content of our questions, and we will be concerned to suggest partial answers to them.

Before proceeding to the central topic, we wish to make a few comments concerning our background assumptions. This paper assumes familiarity with the analysis of thematically complex verbs found in Larson (1988) and with Baker’s work on incorporation (Baker 1988). Our ideas concerning argument structure grow out of an examination of denominal and de-adjectival verbs, like *shelve (the book)*, *saddle (the horse)*, *clear (the screen)*, etc., whose formation appears to be limited by general principles of syntax (cf. Hale and Keyser 1991 in press, Walinska de Hackbeil 1986, 1989). We sometimes refer to the process involved in their formation by means of Talmy’s term “conflation” (Talmy 1985), and we assume that it is to be equated with incorporation and, therefore, with the head-movement instance of the general syntactic rule move-alpha. It is, therefore, subject to the Head-Movement Constraint (Travis 1984, Chomsky 1986b). Denominal and de-adjectival verb formation, while subject to constraints which are fundamentally syntactic in character, is not “productive” in the sense normally attributed of syntactic processes. For this reason, we speak of a “level” of l-syntax (i.e., lexical syntax) at which these formations take place. Although our exposition sometimes opposes this level to the conventional notion of “syntax”, which we term s-syntax (for d-/s-structure and LF representations), we do

not wish to be irretrievably condemned to the view that l-syntax and s-syntax are really distinct. This is a separate question, which we do not attempt to answer here. Its resolution will depend on a number of things, including not only the question of the well-known asymmetry in productivity, but also the important question of whether the full syntactic projections defined for l-syntactic representations, sometimes called Lexical Relational Structures, are “visible” at d-structure. Essentially, this is the question of whether traces of l-syntactic head-movement, or conflation, are visible at d-structure. In any event, the issue is not particularly germane to the views which we wish to examine here.

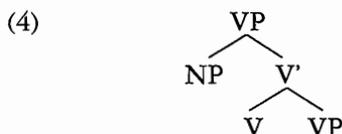
1. Categories and projections

The linguistic elements which we believe to be fundamental in answering the questions in (3) above are in fact nothing new. They are (1) the lexical categories, or parts of speech, and (2) the projection of syntactic structure (i.e., phrase structure, or X-bar structure) from lexical items.

For our purposes, we will assume the traditional categories V, N, A, P (cf. Chomsky 1970), and we will continue to employ this traditional alphabetic notation for them. Furthermore, we assume that this exhausts the inventory of major lexical categories. The fact that the inventory of categories is restricted in this way is relevant, we will claim, to understanding why the inventory of “thematic roles” is also small. In part, the answer to the first of the questions posed above will reduce to another question – namely, assuming it to be (approximately) true, why are the lexical categories just V, N, A, P? We do not pretend to have an answer to this question and assume simply that it has something to do with how certain basic “notional” categories (e.g., event, instance or entity, state, and relation) are expressed in linguistic form. But given this restricted inventory, we are interested in the possibility that there is a relationship between that and the similarly impoverished inventory of thematic roles.

Our understanding of the second of the two factors we have taken to be directly relevant to our questions, i.e., projection of syntactic structure, is due in some measure to Kayne’s discussion of Unambiguous Paths (Kayne 1984) and to Larson’s related proposal, the Single Complement Hypothesis, which requires that the head-complement relation be biunique (Larson 1988).

In particular, we suggest that our questions (3a,b) above find their answer in part in the fundamental nature of the syntactic projections which define Lexical Relational Structures (and therefore also the syntactic structures dominating lexical heads at d-structure). Each lexical head X determines an unambiguous projection of its category —to a phrasal level, XP— and an unambiguous arrangement of its arguments, as specifier and complement, as depicted in (4) below:



The structure depicted in (4) is “unambiguous” in the sense we intend. Thus, for example, the relation *sister* holds unambiguously between V and VP and between NP and V'. Moreover, the relation is asymmetrical in each case, since just one member in the relation is a maximal projection. And the *c*-command relation is likewise unambiguous, in the relevant sense – the “subject” or “specifier” (NP in this instance) asymmetrically *c*-commands the “internal argument” or “complement” (lower VP in this case).

In part, the unambiguous nature of (4) is due to the fact that branching is binary at all non-terminal nodes; and in part also, (4) is unambiguous because it conforms to the X-bar theory of “types”, according to which the levels in a given categorial projection (i.e., the lexical, intermediate, and phrasal levels) are distinct from one another (and are so indicated notationally in various ways, here as X, X', and XP). Our belief is that these aspects of the syntax of Lexical Relational Structures are not *stipulated*, but rather that they follow directly from the notion *unambiguous projection*. That is to say, the theory of grammar does not include a stipulation to the effect that all branching must be binary, or that the projection of types (lexical, intermediate, and phrasal) conform to the distinctness criterion. The theory of grammar requires merely that projections be unambiguous. And we suppose that it simply follows from this that the syntactic structures initially projected from the lexicon must have the (branching and type) properties we have identified. We must merely speculate that this is the case here, since we do not have formal proof of it; but we suspect strongly that the unambiguous projection requirement does in fact yield this result.

In any event, we will speculate further that the unambiguous structure requirement will yield an additional limitation on the projection of categories to types – to wit, the requirement that “intermediate” types (X') be restricted to just one for any given projection. Thus, the structure depicted in (4) represents a full projection of the category V – it includes a specifier (NP), a complement (VP), as well as the lexical (X), intermediate (X'), and phrasal (XP) type-projections. The limitation on types follows, we wager, from the assumption that multiple “intermediate” types would be linguistically (though perhaps not notationally) indistinct – we imagine that they would be “segments” of a single node (in the sense of Chomsky 1986b, where, to be sure, the issue has to do with the nature of adjunction structures, not intermediate type-projections).

Given the principle of unambiguous projection, and given the four lexical categories traditionally assumed (V, N, A, P), we can propose an answer to the questions posed in (3).

2. Thematic relations and theta-role assignment

Our basic answer to the question expressed as (3a) — why there are so few thematic roles — is that, in an important sense, there *are* no thematic roles. Instead, there are just the relations determined by the categories and their projections, and these are limited by the small inventory of lexical categories and by the principle of unambiguous projection.

While we might assign a particular thematic label, say "agent", to the NP in (4), its grammatical status is determined entirely by the relation(s) it bears in the Lexical Relational Structure (LRS) projected by the lexical head V. Specifically, the NP of (4) bears the "specifier" relation within a VP whose head takes a complement which is also a projection of the category V. It is not without reason, of course, that the term agent is associated with the subjects of verbs —like *cut, break, drop, send, give, tighten, put, shelve, saddle*, etc.— which share the LRS of (4). But we would like to suggest that the thematic terminology typically applied in this case simply reflects the *relational* status of the NP in the upper specifier position.

The use of the term "agent", we imagine, is appropriate here simply because of the elementary semantic relations associated with (4) by virtue of the elements which enter into the structure. Each of the lexical categories is identified with a particular notional "type", and the relational structures they project define an associated system of semantic relations, an "elementary meaning", so to speak. Thus, for example, the category V is associated with the elementary notional type "event" (or perhaps, "dynamic event"), which we can symbolize e (cf., the usage in Higginbotham 1985). The LRS depicted in (4) contains a V heading the structure as a whole, and another (implicit in the tree) heading the complement VP. The structural relation of complementation involves an asymmetrical c-command relation between the two verbs — the matrix V asymmetrically c-commands the subordinate V (head of the complement VP).

The structural relations of c-command and complementation are unambiguous in (4), as required. Since the lexical items involved there have elementary notional content, it seems reasonable to suppose that, in addition to the structural relations associated with the projection, there are elementary semantic relations associated with (4) as well. And further, the semantic relations associated with (4) are unambiguous and fully determined by the LRS projections of categories. The matrix V of (4) governs another V, the head of its complement. Corresponding to this syntactic relation, there is a similarly asymmetric (semantic) relation between two events, a relation which we will take to be that of "implication". Accordingly, the matrix event "implicates" the subordinate event, a relation which makes perfect sense if the syntactic embedding corresponds to a "semantic" composite in which the subordinate event is a proper part of the event denoted by the structure projected by the main verb:

$$(5) \quad e_1 \rightarrow e_2$$

Let us assume that (5) is the "semantic" relation associated uniformly with the complementation structure (6), in which a lexical V takes VP as its complement in LRS representations.



The syntactic structure (6) and the associated semantic relation (5) comprise the LRS expression of what is commonly called the "causal" relation (see Lombard 1985,

for relevant discussion of relations among events and for an appropriate formal semantic representation of the causal relation). In this light, it is with some justification that the NP in (4) is typically associated with the thematic role term “agent” – inasmuch as it bears the specifier relation in the structure projected by the “causative” verb. This NP bears a syntactically unambiguous relation to the V’ of (4), and, by hypothesis, its semantic relation within the structure is likewise unambiguous and fully determined by the LRS. Suppose we symbolize this relation as > and devise a composite elementary “semantic” representation for the entirety of (4):

$$(7) \quad i > (e_1 \rightarrow e_2)$$

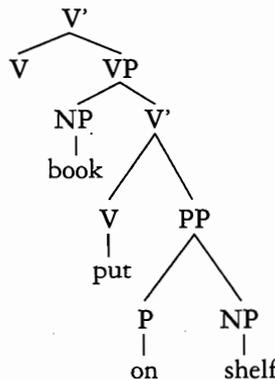
In (7), we represent the notional type of the category N as *i* (for “instance”), following Leder (in progress). We can choose to use the expression “agent of” to refer to the relation borne by *i* in (7), but this, like (7) itself, is entirely derivative under the assumptions we hold here.

Similar remarks are appropriate to the syntactic and semantic characterizations of the relations inherent in other LRS projections determined by lexical items. And a survey of plausible LRS representations suggests ready candidates for association with the standard thematic terminology. That the list of thematic role terms is not endless or even large follows, we claim, from the fact (if it is a fact) that the roles are derivative of lexical syntactic relations, and these are limited in the manner we have described.

In actual fact, however, we cannot now substantiate the claim we are making – i.e., that all theta-roles are derivative of lexical syntactic relations or, to phrase it in a slightly different manner, that argument structure is expressed entirely in the syntactic structures projected by heads (X) belonging to the lexical categories. At this point, we can say simply that we are in the process of attempting to show that this view is correct in essence, and we will proceed to discuss a few more examples, restricting ourselves primarily to the V category.

Consider, for example, the “inner VP” of (6) above. One possible system of projections dominated by that node is the structure we have associated with the English verb *put* (following Larson 1988, cf. also Hale and Keyser 1991, in press), as in *she put the book on the shelf*:

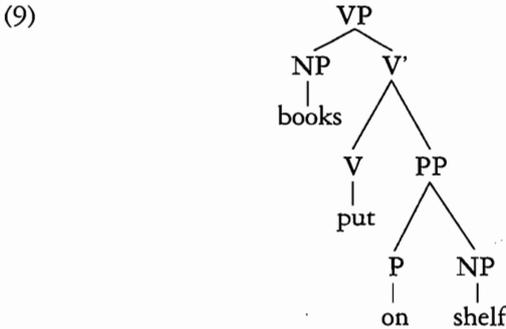
(8)



This LRS representation is shared by a vast number of English verbs, including a large number of denominal verbs formed by conflation of the N object of the PP argument – e.g. *shelve, pen, corral, box, saddle, blindfold*, and the like, putatively formed by incorporation of a nominal into an abstract P and thence successively into the abstract Vs (cf. Hale and Keyser 1991, in press).²

By hypothesis, the syntactic relation between the matrix V and the inner VP corresponds uniformly to the “causal” relation, by virtue of the syntactic relation itself and by virtue of the elementary notional type associated with the V category. The external argument of the matrix verb bears an unambiguous syntactic relation to it and, by hypothesis, its elementary semantic connection to the structure is likewise unambiguous – it is the “agent” following accepted usage.

Now let us consider the inner VP itself:



In this structure, the head-complement relation involves the categories V and P, with the latter subordinate to the former. We will continue to assume that the notional type of V is “(dynamic) event” (*e*), and we will suggest that the notional type of P is “interrelation” (we will use *r* to symbolize this). The *r*-relation includes—but is not to be strictly identified with—relations commonly thought of as spatial or locational (cf. Kipka 1990, for detailed criticism of the “locationist” conception of adpositions). If these basic semantic notions combine to assign an elementary semantic value to the syntactic structure in which they appear, then they will do so unambiguously, since the syntax is itself unambiguous. We suppose that the semantics of the relation embodied in V' of (9) is that according to which a (dynamic) event “implicates” an interrelation, as expressed in (10), utilizing the elementary notation we have adopted:

$$(10) e \rightarrow r$$

The most salient “meaning” attached to this structure is “change”. Thus the elementary semantic expression embodied in (10) corresponds to the situation in which

(2) In assuming complex VP structures as the basis of denominal location (e.g., *shelve*) and locatum (e.g., *saddle*) verbs, we do not intend to imply that a conflation such as *shelve* “means” the same thing as its analytic paraphrase *put on a shelf* (cf., *put the sand on a shelf* beside *shelve the sand*). We maintain simply that they share the same LRS (a claim which could also be wrong, to be sure). We will not address here the very real linguistic problem of accounting for the fact that conflations typically do not, in the full sense, mean the same things as expressions usually offered up as their analytic paraphrases.

some entity, represented by the subject, comes to be involved in an interrelation with an entity corresponding to the NP object of the P.

An interrelation involves at least two entities, of course. Thus, the preposition *on*, for example, relates some entity (functioning as a place, typically) and some other entity (typically a thing, substance, or the like), as in such sentences as *a fly got in the soup* or *mud got on the wall*. However, the syntax of V' in (9), given the principle of unambiguous projections, has just one expression (NP object of P) corresponding to an entity entering into the interrelation *r* established by P. Therefore, a "subject" (specifier of VP) is required in VP as an absolute necessity in the lexical syntactic projection of V here. We continue to use the symbol > to represent the semantic relation which the subject bears in relation to the V' expression, but this is nothing more than a notational filler at this point — more will be said presently about the syntax and semantics of the subject relation in Lexical Relational Structure representations.

The subject NP in (9) corresponds to an entity which completes the interrelation *r*. It is the subject of a "predicate of change" and, therefore, as in the syntax, it is external to the semantic expression assigned to V':

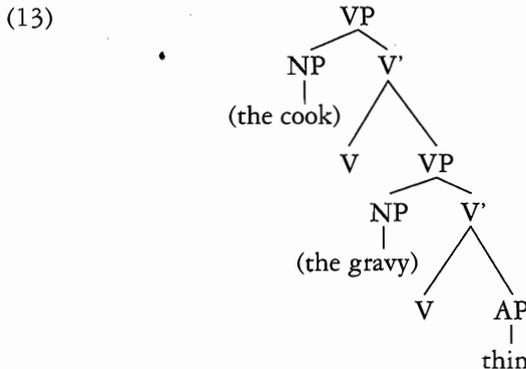
$$(11) i > (e \rightarrow r)$$

The subject of a change predicate is sometimes called a "theme" (cf. Gruber 1965, Jackendoff 1972) or an "affected patient" (cf. Anderson 1977, Pesetsky 1990). Again, however, these semantic roles, like the elementary semantic interpretations in general, are derivative of the lexical syntactic relations.

In an accepted view of thematic relations, the "theme" roles, and the associated elementary semantic relation "change", extend to predicates of the type represented in (12) below:

- (12) (a) The oven browned the roast.
 (b) The storm cleared the air.
 (c) The cook thinned the gravy.
 (d) This narrows our options.

We assume that the verbs here, like the others we have been examining in this study, are derived by conflation. Here, however, the conflating elements are adjectival. The Lexical Relational Structure of the verb in (12c) is set out in (13):



The upper V in (13) projects the LRS associated with the “causal” relation represented in (6) above. The lower V projects a structure which is parallel to the VP displayed in (9), but with the PP of the latter replaced by AP, the phrasal projection of the adjectival category A.

The lexical category A is associated with the notional type “state” (*s*), and the elementary semantic relation associated with the V’ projection is presumably as in (14):

$$(14) e \rightarrow s$$

That is to say, an action or dynamic event “implicates” a state. Or to put it another way, a state is achieved as an integral, or defining, part of a dynamic event. This corresponds, we suggest, to the notion of a “change resulting in a state”.

It is a fundamental semantic requirement of AP that it be attributed of something, e.g., of an entity. Thus, just as in the case of PP complements, so also in the case of AP complements, a “subject” necessarily appears in the specifier of VP (i.e., *the gravy* in (13)). And this subject is integrated into the associated semantic representation in the usual way:

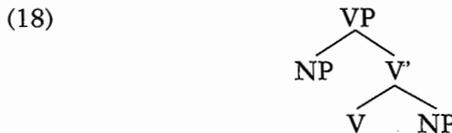
$$(15) i > (e \rightarrow s)$$

Again, the subject can be thought of as the “theme”, inasmuch as it corresponds to an entity undergoing change.

We have examined three of the complement types available in LRS representations, i.e., those projected by the categories V, P and A. The fourth type, that projected by the category N, is exemplified by the unergative verbs of (16) and the simple transitives of (17):

- | | |
|-----------------------------|---------------------------------|
| (16) (a) The child laughed. | (17) (a) We had a good laugh. |
| (b) The colt sneezed. | (b) She did her new song. |
| (c) Petronella sang. | (c) The ewe had twins. |
| (d) The ewes lambded. | (d) This mare does a nice trot. |

In both cases, the abstract relational structures here involve a verbal head projecting a V’ structure containing an NP in complement position:



In the case of (17), of course, the complement NP is a categorial variable in the LRS representation of the various verbal lexical items; it is realized as an NP argument in s-syntax, through lexical insertion in the usual manner. In the case of (16), on the other hand, the complement NP dominates a constant, the nominal source, through conflation, of the denominal verb (see Hale and Keyser 1991, for some discussion of this).

If it is appropriate to assume that the elementary semantic structures are associated with syntactic structures in the unambiguous manner suggested so far, then the semantic structure associated with the V' of (18) is as in (19):

$$(19) e \rightarrow i$$

Here, an action or dynamic event “implicates” an entity, or instance, i . This corresponds to the notion that the implicating event is completed, or perfected, by virtue of the “creation”, “production”, or “realization” of the relevant entity or instance.

If (18) is the correct relational structure for unergatives, and for the “simple transitive” (light-verb, cognate object, and creation predicate constructions), then full expression of the associated semantic structure is as follows, integrating the “subject” into the interpretation in the customary manner:

$$(20) i > (e \rightarrow i)$$

This correctly reflects the fact that the sentences of (16) and (17) clearly have subjects at s-structure. In fact, all members of the category V which we have examined here project structures which, at some point or other, have subjects. It is nevertheless legitimate to ask whether the lexical relational structures of verbs necessarily express the specifier relation. We will turn to this question in the following section.

2. Categories and specifiers

We have been considering a conception of lexical syntactic projections according to which any appropriate VP may “embed” as the complement of a verb. Structures (8) and (13) represent projections of just this type. And verbs projecting both these structures are energetically represented in the verbal vocabulary of English, for example.

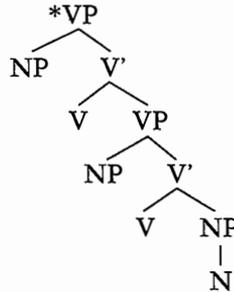
But there are some gaps, and the theory of argument structure which we are considering must have an explanation for them. Consider the following ill-formed usages:

- (21) (a) *The clown laughed the child. (i.e., got the child to laugh)
 (b) *The alfalfa sneezed the colt. (i.e., made the colt sneeze)
 (c) *We'll sing Loretta this evening. (i.e., have Loretta sing)
 (d) *Good feed calved the cows early. (i.e., got the cows to calve)

These sentences represent an extremely large and coherent class of impossible structures in English. In particular, unergative VPs cannot appear as complements of V – i.e., an unergative may not appear in the l-syntactic “causative” construction, as depicted in (22):

This structure, the putative source of the verbs in (21), satisfies all conditions so far considered in our discussion. No principle precludes it, so far. But the structure is consistently absent, so far as we can tell, from the English vocabulary of denominal verbs.³ Why should this be?

(22)



The answer, we think, lies in the LRS representation of unergative verbs. The verbs of (21) are a problem only under the assumption that they have the relational structure (18) – in particular, the problem is in our assumption that these verbs have a VP-internal subject. If we assume instead that unergatives do not have a subject in l-syntax, then the problem disappears, since the structure depicted in (2) cannot exist and, therefore, the verbs of (21) cannot exist either.

This is our answer. Unergatives have no subjects in their LRS representations. But for this to be a solution of any interest, it must be something other than a stipulation to the effect that some verbs have a subject in LRS and others do not. Which verbs are allowed not to have VP-internal subjects at l-syntax? Which verbs must have a subject, as the inner VP of *shelve* and *clear* surely must? If these questions have no answer, our suggested explanation for (21) is no more than an observation.

In the relational structures of the location and locatum verbs studied above—verbs like *shelve* and *saddle*—and, likewise, in the relational structures of change of state verbs of the type represented by (12), the appearance of a subject in the inner VP is “forced”, being required by the complement within that inner VP. In essence, since the complement in the inner VP is a predicate in the LRS representation of those verbs, full interpretation of the inner VP requires that a subject appear, internal to the VP, so that predication can be realized locally, as required (cf. Williams 1980, Rothstein 1983), thereby correctly relating the complement of the inner VP to the subject of that VP.

We will assume that the specifier position of VP in the LRS representation of a lexical verb is filled only when that is forced by some principle. In the case of change of state or location verbs just considered, the appearance of a subject is forced by predication, we suggest.

For verbs of the class now commonly termed “unergative”, nothing forces the appearance of a subject. This follows, since the complement in the lexical relational

(3) This is a feature which distinguishes l-syntactic representations from s-syntax, where causatives in many languages readily take unergatives. We postpone for later work the class of prima facie l-syntactic counterexamples represented by English *trot the mule*, *jump the horse*, and *run the bounds*; cf. Brousseau and Ritter, 1991.

structures of such verbs is not a predicate. We can assume, then, that the subject is in fact excluded from the LRS representations of unergatives.

In our attempt to answer the questions formulated in (3) above, we suggested that argument structures, or LRS projections, were constrained in their variety by (a) the paucity of lexical categories, and (b) by the unambiguous nature of lexical syntactic projections. If what we have suggested here for unergative verbs is correct, then we must consider an additional limit on the variety of possible argument structures – specifically, we must also determine what is it that forces the appearance, or absence, of a subject.

We believe that nothing new has to be added to achieve the correct result. This result is in fact given by the general principle according to which linguistic structures must be “fully interpreted” (Chomsky 1986). The principle of full interpretation will guarantee that verbs of change of location or state *have* a subject in the inner VP – absence of the subject would leave the complement of the inner VP uninterpreted (see Rothstein 1983, whose work on predication we take to be true origin of this idea). The same principle will also guarantee that unergative verbs *lack* a subject in their LRS representations – a subject, if present in an unergative LRS, would itself be uninterpreted for lack of a predicate in the complement position. The s-syntactic subject of an unergative verb is, therefore, a “true external argument”, appearing in the specifier position of the functional projection IP (or, in the case of small clause constructions, in the adjoined position assumed by the subject).

These remarks on l-syntactic internal subjects apply not only to verbs which involve conflation, of course; they also apply to “analytic” constructions in which the main verb appears with an overt complement. Thus, for example, various constructions employing the relatively abstract English verb *get* exhibit the predicted range of acceptability in the causative. Thus, for example, *get drunk* and *get into the peace-corps*, with complements which are inherently predicative, permit not only the intransitive form (e.g., *my friend got drunk*, *my friend got into the army*), but they also appear freely in the causative form (e.g., *we got my friend drunk*, *we got my friend into the peace-corps*). By contrast, expressions like *get the measles*, *get smallpox*, and the like, with nominal (hence non-predicative) complements, cannot appear in the causative, as expected by hypothesis (e.g., **get my friend the measles*, *get my friend smallpox*, in the relevant sense). Alternative explanations (e.g., case theory, for one) exist to explain this contrast, but we would like to suggest that a more straightforward l-syntax explanation exists, accounting not only for these examples but also for the ill-formedness of **laugh my friend*, where a case-theory account is not plausible (given *laugh my friend off the stage*, in which *laugh* does assign case, apparently; Cf. Burzio 1981).

Given the above considerations, we can assume that the structures which express the relations among the arguments of a verb are characterized by the operation of two fundamental defining principles, (23a) and (23b):

(23) Lexical Relational Structure (Argument Structure):

- (a) unambiguous projection; (b) full interpretation.

To the extent that they are correct, these principles, in conjunction with the restricted set of lexical categories (V, N, A, P), determine the limits on the range of relations which arguments can enter. This effectively answers question (3a), concerning the paucity of so-called thematic roles. The principles also define a precise class of relational structures. And to that extent, they answer question (3b), since the LRS representations embody biunique structural-semantic (i.e., structural-thematic) relationships for all lexical items.

Although it is perhaps premature to assert this now, it is likely that the requirement of full interpretation prevents the appearance of a subject within the projections of the categories other than V. This follows, since the semantic licensing of a subject in the specifier position projected by a given category is, by hypothesis, through predication of a complement in that same projection – in short, a subject is licensed by local predication. If the lexical structure representations of the categories P, N, and A do not take complements which are predicates, then it follows that they cannot themselves have subjects. If this is true, then to that extent, the class of potential lexical structures is further constrained.

To say that the non-V categories do not take predicate complements in their lexical structure representations does not mean, of course, that there are no “predicative” complements to these categories at d-structure, for example. Thus, consider such predicates as *out to get us*, *proud to be here* in which the complements are clausal, and hence contain predicates. But these are not simple predicates of the type permitted in l-syntactic representations. If they are infinitivals, as they appear to be, they are complete in their relational structure and *cannot* be predicates (in our view, but see Williams 1980). Consequently, *out* and *proud* here cannot have “local” subjects, i.e., subjects within their own projections, since their complements do not require that the specifier position be filled. Besides, if the complements *to get us* and *to be here* are infinitivals, headed by the functional category INFL, then they do not represent a class of projections available at l-syntax as we have defined it, and, if they are not, they are simply irrelevant to the discussion.

The question remains whether any of the non-V categories take predicates in the sense of the foregoing discussion, i.e., predicated directly of a local subject. Beguiling candidates are constructions like *good at her job*, *dynamite at calculus*, in which the complement is a PP. However, these are not real instances of what we are seeking. The PP complement here is, in reality, an oblique object, marked for case by means of the preposition. To say that someone is good at her job or dynamite at calculus does not involve predicating *at her job* or *at calculus* of the subject of the sentence, or of anything, for that matter. To be sure, to say that someone is *good in the ring* does involve (secondary) predication of a PP – *in the ring* is predicated of the subject, but this PP is not a *complement* of the adjective, properly speaking (see Rapoport 1990, for relevant discussion of secondary predication and for references to an extensive literature on the subject).

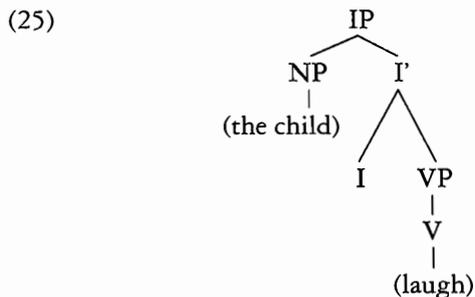
3. The specifier position and the depth of embedding in lexical relational structures

If the specifier position for so-called “unergative” verbs, like those in (16) above, is excluded by virtue of the principle of full interpretation, then their expressed sub-

jects must be “external”, as we have said. The Lexical Relational Structure of a verb like *laugh* cannot be as in (18). Rather, it must be something on the order of (24) – at least that is what we will assume for present purposes:



The precise sense in which the subject of an unergative verb is external can be left vague, for our purposes, but it will involve at least the following assumptions: (a) the subject is not present in the LRS projection of the predicator and, (b) it is not dominated by the maximal projection of the predicator at d-structure (though it might be an adjunct to that node, cf. Sportiche 1988). In English, at least, subjects in general are in the specifier of the functional category IP, and that could, in principle, be the d-structure position of unergative subjects, which is what we will assume for expository purposes. Thus, omitting some irrelevant details, the d-structure of (16a) —i.e., *the child laughed*— is essentially as in (25):



The verb, by hypothesis, is the result of conflation – of the LRS object *laugh* into the abstract V which heads the lexical item as a whole. There can be no VP-internal subject, by the principle of full interpretation, so that the expressed subject must be external.⁴

We must assume that the VP in (25) is a predicate at d-structure; it therefore requires a subject at some level in s-syntax, by the extended projection principle (Chomsky 1982, and Rothstein 1983), presumably a corollary of the general principle of full interpretation. The required subject must at least appear in specifier of IP at s-structure (our assumption that it appears there at d-structure is merely a convenience).

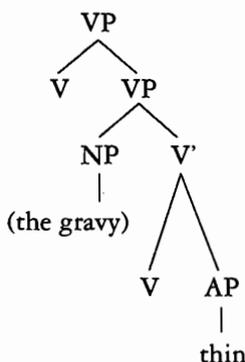
There are a number of problems which must be addressed in relation to the external subjects of verbs which have no “internal subject” in their LRS representations. We ask the reader’s indulgence in this regard. The problems we allude to are, in part, inherent in our approach to the study of argument structure, and we are still very much in the process of dealing with the issues that arise. For the moment, we

(4) The s-syntactic representation (25) is simplified from the l-syntactic representation in various ways — e.g., by erasure of the trace defined by head-movement, together with the phrasal node projected thereby. We leave open here the important question of whether the material thus deleted is “visible” at d-structure.

assume simply that the VP of (25) is inherently a predicate at d-structure, probably because of the elementary "meaning" associated with it (i.e., (19)) – perhaps, linguistically speaking, a "dynamic event" must have an expressed "cause", "perpetrator", "source", or the like, as in (20). Whatever the reason, it is a fact, pure and simple, that unergatives have a subject ... they are predicates, from the point of view of grammar, and they must be predicated of certain kinds of linguistic expressions (normally NPs), and there are certain relatively well understood selectional restrictions on predication (*neigh* of horses, *low* of cattle, *bleat* of sheep, and *talk* of people, *rain* of ambient *it*, and so on). This is prototypical predication. But since the subject of an unergative, by hypothesis, cannot be internal to the VP projection in l-syntax, since its appearance there is not forced by the principle of full interpretation, we must assume that the predication requirements must be met in s-syntax, by an external subject.

If this reasoning is correct, then it must apply equally to the lexical relational structure representations of verbs associated with the "causal semantics" informally expressed in (7) – i.e., to location verbs (like *put* and *shelve*) to locatum verbs (like *saddle*, *blindfold*), and to verbs of change of state (like *thin*, *lengthen*, *break*, and the like). This follows, since the inner VP, being "complete", and therefore not a predicate, cannot force the appearance of a subject in the matrix VP. Accordingly, the structure presented in (13), for the verb *to thin* (as of *gravy*, *paint*), must be corrected to (26), omitting the matrix subject.

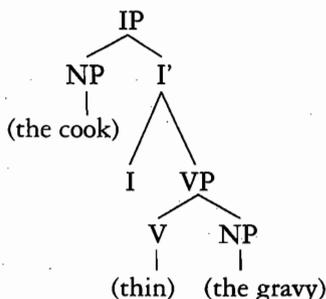
(26)



Thus, in a sentence employing this verb, like *the cook thinned the gravy*, the expressed subject (i.e., *the cook*) must be external to the lexical VP projection at all levels of s-syntactic representation, as is the subject of an unergative verb. And, further, as in the case of unergatives, predication at d-structure is the means by which the expressed subject is interpreted, the domain of predication being the IP, in which the expressed subject occupies the specifier position in s-syntax, as in the abbreviated d-structure (27).

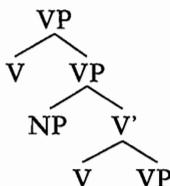
The verb here is derived in l-syntax by successive incorporation of the adjective *thin* into the abstract verbs of (26), in conformity with the provisions of the head-movement process:

(27)



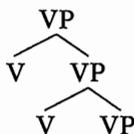
Our analysis of unergative and causative verbs depends on the notion that a VP is not a predicate in l-syntax. If this notion is correct, then we can explain—in part, at least—why there is a limit on recursion in LRS representations. Generally, the lexical relational structure for a verb has at most one VP embedding. Thus, so far as we know, no verb corresponds to the hypothetical LRS structures (28), the reason being that the structure fails to satisfy the requirement of full interpretation—the most deeply embedded VP is not a predicate, so, by that hypothesis, the inner subject is not licensed:

(28)

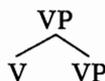


But, if this structure is illicit because of a failure of predication, then what if the NP is simply omitted? This would give (29), also non-existent, so far as we know:

(29) (a)



(b)



We assume that the same general principle precludes this structure as well. The “double causative structure” cannot be interpreted, since only one can be predicated of a subject in s-syntax. Again, this is a failure of predication (of the inner VP in this case) and, hence, a failure to achieve full interpretation. Thus, unrestricted recursion of the VP category—while it is similar in character to the s-syntactic recursion freely permitted, for example, by clausal complementation—is impossible in the syntax of LRS representations, precisely because of the full interpretation requirement.⁵ It is

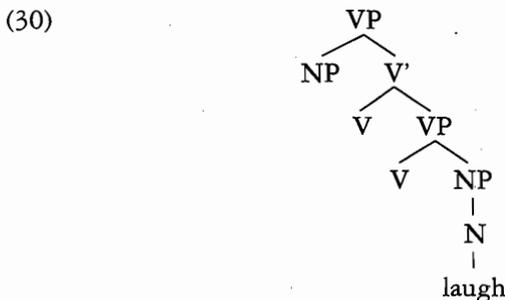
(5) Full interpretation is a requirement of s-syntactic structures as well, of course, but its effect there is different, due, among other things, to the properties of the various functional categories, which define a Specifier position for external arguments.

also quite possible that (29a) is ruled out on the even more general grounds that, in LRS representations, it is not distinct from the simpler structure (29b). If it is not, then considerations of ambiguity and economy will rule the more complex structure (29a) out.

4. Some remarks on subjects and external arguments

There is clearly a sense in which a subjectless VP is an open expression, since it functions freely as a predicate in s-syntax – e.g., *laugh* in (25), where an unergative verb is predicated of an NP in s-syntax; or similarly, the causative *thin*, also putatively subjectless in lexical relational structure, predicated of *the cook* in (12c) above.

The fact that these unergative and causative lexical relational structures correspond to VPs which function as predicates in s-syntax makes it necessary, of course, to ask seriously whether they might also function as predicates in l-syntax. We must, for example, consider the possibility that the lexical VP corresponding to *laugh* could be an l-syntax predicate and, therefore, be permitted to appear as a complement to an l-syntax matrix verb which, by the principle of full interpretation, would force the appearance in the matrix of a subject, as in (30):



One possibility, of course, is that this is in fact the correct representation of the verb *laugh* and, correspondingly, the same “causative” structure might be assigned to all unergatives, accounting for the “agentivity” or their subjects, perhaps.

Suppose the inner VP corresponds to the elementary notion of the happening of an event *e* which “implicates,” or “is” a laugh. The matrix VP simply represents the causal relation, as before. And *Mary laughed*, under the analysis implied in (30), would correspond to something like *Mary caused a laugh to happen*. But this is wrong semantically. While *Mary broke the pot* can correspond to a situation in which Mary indirectly causes a pot to break (e.g., she bumps against the wall causing the pot to fall off the shelf, or so), *Mary laughed* cannot correspond to any such situation (e.g., Mary told a joke causing laughter, or the like). The system of relations expressed in (30) is far too “indirect”.

Be this as it may, we *must* argue that (30) is an impossible structure. Otherwise, we cannot account for the ill-formedness of **we laughed Mary* and the full range of structures it represents. If (30) were a possible lexical relational structure, of course, then nothing would prevent it from appearing as the complement of V, yielding an

LRS representation which, in the relevant respects, is the same as those of an ergative verb like *break*, a locatum verb like *saddle*, or a location verb like *shelve*, verbs whose internal VP *does* have a subject. We would be forced then to seek elsewhere for an explanation of **laugh Mary*, **cry Billy*, **sing Merl*, #*break Billy a pot* (not equal to *cause Billy to break a pot*), #*holster Matt his pistol*, and the like. If (30) is simply impossible, then these problems disappear.

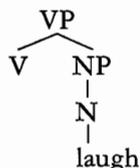
The key to this problem, we feel, is to be found in an understanding of the notion "predicate". Let us put aside, first, the obvious fact that VP can be a predicate at d-structure in s-syntax. We know, for example, that an NP can also be a predicate there, though, by hypothesis, it *cannot* be a predicate in LRS representations in l-syntax. So, the question we must ask is whether VP is a predicate in l-syntax. We want the answer to this question to be "no", obviously, since (30) is impossible, according to the view we are advancing.

Considering just the relations expressed in l-syntax, the notion "predicate" can be correlated with the elementary notional type associated with the four categories. The category P projects a predicate, because it is inherently relational – thus, an expression of the type represented by *on the shelf* requires an additional argument, a subject, because the preposition *on* relates a place (e.g., *shelf*) to some other entity; that is the fundamental characteristic of the category realized by prepositions in English. Similarly, the category A, we maintain, represents the fundamental notional type of "attributes". We maintain that this property of adjectives forces the appearance of a subject in l-syntax, since the relation "attribute of", inherent in adjectives, must be satisfied by predication. By contrast, we have argued, the category N is fundamentally non-relational, and hence cannot license the appearance of a subject in l-syntax.

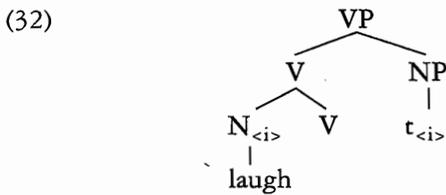
Now we must address the problem of the category V. Does V project a predicate in l-syntax? We have said that the fundamental notional type associated with the category V is "(dynamic) event". We wish to argue that this category is *not* inherently relational. An event is no more relational than an instance or entity is relational. While an event may have participants, and these may have "interrelationships" internal to the event, the latter is not itself a relation. Thus, while the category VP is the paradigm predicate in s-syntax, it is *not* a predicate at l-syntax, where the notion "predicate" correlates strictly with the elementary notional type of a category. Accordingly, VP does not license the appearance of a subject in an immediately superordinate clause, and (30) is therefore not a possible l-syntax representation. So the English verb *laugh*, and all verbs of the type, acquire their subjects through predication at d-structure. Their subjects are "true" external arguments.

Assuming this view of the matter, an unergative verb of the type represented by *laugh* will have an initial LRS representation of the form depicted in (31):

(31)



Actually, of course, this is a simplification. The complete l-syntactic representation of an unergative verb is a *derivation* which, by hypothesis, is defined by the conflation process (i.e., incorporation by head-movement) applied to an initial structure of the simple verb-object form exemplified by (31). Assuming that the conflation process responsible for denominal verb formation is in fact incorporation, and if it is subject to general constraints on transformational rules (as argued in Hale and Keyser 1991, and in press), then l-syntactic head movement, like the corresponding process at s-syntax, must involve structures in which empty categories, specifically *traces*, are appropriately related to *antecedents*. Thus, head movement defines a structure of the form (32) from the initial structure (31) above:



This structure is licit under the conditions on head-movement (cf. Travis 1984, and Baker 1988), hence the relation between the trace and its antecedent (the incorporated N, with which it is coindexed) is necessarily licit. In general, we make crucial use of constraints on head-movement in suggesting explanations for the ill-formedness of certain conflations which, on *a priori* grounds, should be possible – e.g., “external subject conflations” of the type represented by **it stormed Rama Cay*, in the sense of *a storm did something to Rama Cay*, “dative conflations” as in **house a coat of paint* in the sense *give a house a coat of paint*, and “small clause subject conflations” as in **metal flat* in the sense of *flatten metal, render metal flat* (cf. Hale and Keyser 1991, and in press, Walinska de Hackbeil 1986, 1989). Our perception of these matters requires that we assume derivations of the type suggested by (31-32) and, in particular, derived structures involving trace-antecedent relations (i.e., “chains”) like that indicated by coindexation in (31).

Without meaning to prejudice the question of whether l-syntactic traces are “visible” at d-structure, or anywhere else in s-syntax, we employ the trace-pruning convention to abbreviate the syntactic structure projected by the verb *laugh* to its conventional “intransitive” form (33):

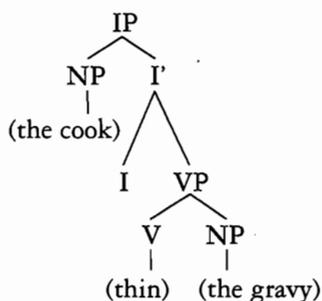


Thus, while we will assume that the full derivation of an unergative verb (and the same applies *ceteris paribus* to all verb types) is “visible” in the lexicon, and is therefore an integral and accessible part of our linguistic knowledge, its full complexity will be abbreviated in s-syntactic representations here. The abbreviation is achieved by means of a simple algorithm according to which any l-syntactic trace, and each

categorical node it projects, is deleted – accounting for the monadic structure of (31) through deletion of the nominal trace and the categories it projects (N, and NP).⁶

The analysis suggested here for unergative verbs extends naturally to causative verbs as well, i.e., to attribute causatives (e.g., *thin*, *tighten*, etc.), locatum verbs (e.g., *saddle*, *bridle*), and location verbs (e.g., *pen*, *corral*). Thus, for example, the structure given in (13) for *thin* (*the gravy*) must, by hypothesis, be rejected and replaced by (26); and correspondingly for verbs like *shelve* (*the books*) and *saddle* (*the horse*). The “agentive” s-syntactic subjects of such verbs, in their transitive use, are “truly external”, as depicted in (27) for the attribute causative verb *thin* repeated here as (34), in which the internal VP (conflated from (26)) is abbreviated in the manner just suggested:

(34)



Locatum and location verbs also project s-syntactic VP structures of this simple transitive sort.

If the s-syntactic subjects of transitives and unergatives are “external subjects,” how are they in fact related to their verbs? In a sense, of course, the answer is simple – they are related to their verbs through predication. Relative to the VP, they appear in an s-syntactic position (e.g., Spec of INFL) appropriate for predication (cf., Williams 1980, Rothstein 1983, Rapoport 1987).

We will assume that this answer is correct. But there is, of course, a deeper question. Is this external subject a part of the argument structure of the verb which heads the VP predicated of it? Is the external subject an argument, in any sense, in the l-syntactic representation of the verb? Does it get its theta-role from the verb?

The answer to this question, we believe, is negative. The external subject is not present in the LRS representation of the verbs under consideration here. At least, it is not present in the sense of this framework – e.g., in the sense in which an object, say, is present, as a point in the LRS projection defined by the verb. It cannot, therefore, “receive its theta-role” from the verb, since the concept “theta-role”, to the extent that it can be understood in the context of LRS representations, corresponds precisely to the notion “lexical relation”, defined over the LRS projection. If the subject

(6) The situation is somewhat more complex than this however, since the derived verb is also abbreviated in (33); it is abbreviated from its complex l-syntactic form consisting of the verb root (zero) and the (adjoined) noun corresponding to the “morpheme” *laugh*. Here again, the question arises whether this internal structure, as opposed to the overall category V, is “visible” at d-structure. For the general importance of zero derivational morphology, and issues akin to “visibility”, see Myers 1984, and Pesetsky 1990.

is absent from the LRS representation of a verb, then it cannot “get its theta-role” from the verb, clearly.

How, then, do we account for the fact that the external subjects of unergative and causative verbs, say, are understood as “agents” in relation to the events named by those verbs? How is the “agent role” assigned?

We assume that it is in fact correct to say that the subjects in question are associated with a semantic role, typically the role termed “agent”, and we will adhere to the traditional usage in saying that these subjects are “assigned the agent role”. But, we assume that this assignment is “constructional”, in the sense that it is effected in a syntactic configuration defined in s-syntax. This manner of assignment, we contend, is to be distinguished entirely from that associated with the semantic roles (theme, patient, goal, etc.) corresponding to the l-syntactic relations defined by LRS projections. The agent role is a function of s-syntactic predication. In so far as it concerns the agent role, this view of the matter is essentially that developed by Chomsky 1981 and Marantz 1984, according to which the subject receives its semantic role from VP, not from the V itself.

Not all subjects are “external” in this sense, of course. And, accordingly, not all subjects are “agents”. Verbs of the type represented by *thin (the gravy)*, *tighten (the cinch)*, *loosen (the girth)* —i.e., members of the class of “ergative verbs” (cf. Burzio 1981; Keyser and Roeper 1984)— have the property that they may project both transitive and intransitive s-syntactic verb phrases. In the latter case, the internal NP undergoes movement to subject position —i.e., to Spec of INFL in the following sentences:

- (35) (a) The gravy is thinning nicely.
 (b) The cinch finally tightened.
 (c) The girth loosened.

Here, the s-syntactic subject is “internal” in the sense that it is an argument internal to the LRS representation of the verbs. We maintain that it is exactly this internal subject which is to be identified with the “affected argument” of the Affectedness Condition, which has played an important role in lexical and syntactic studies since Anderson’s work on passive nominalss (Anderson 1977; and for relevant recent studies of the role of the affectedness property, see Jaeggli 1986, and Pesetsky 1990). If the affected argument is an internal subject in l-syntax, as we believe, the semantic notion “affected” is correlated with a structural position in the l-syntactic representation of verbs.

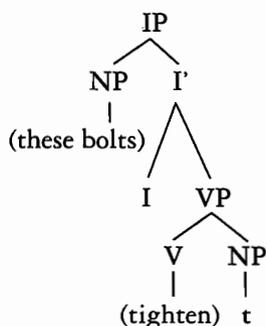
The verbs of (35) above belong to the class of so-called “ergative verbs”, exhibiting an “uncompromised” transitivity alternation along the ergative pattern (i.e., with object of transitive and subject of intransitive the stable argument in the alternation). But to this class of verbs must be added the so-called “middle” of English, which exhibit the same transitivity alternation, “compromised” by various well-known requirements which must be met for full acceptability (e.g., use of the generic, a modal, or an adverb like *easily*, etc.):

- (36) (a) Rye bread cuts easily.
 (b) These bolts tighten easily.
 (c) Limestone crushes easily.

Of course, all ergative verbs can be used in the middle construction – (36b) is a good example. The middle, like the inchoative (i.e., the intransitive use of ergatives as in (35)), involves s-syntactic movement of an internal subject. Transitive verbs which can undergo middle formation are just those whose s-syntactic object is an “affected argument”, i.e., those verbs whose s-syntactic object corresponds to an internal subject in l-syntactic structure.

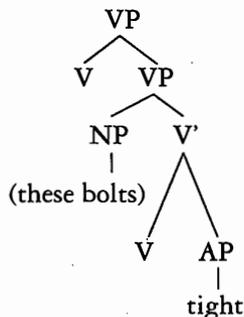
Under these assumptions, is it perhaps not sufficient to assume that the relevant portion of the s-structure of the middle sentence (36b) is simply that depicted in (37), in which the derived subject heads a chain with the trace (of NP-movement) in s-syntactic object position.

(37)



This is insufficient, since the VP here is indistinguishable from that of expressions of the type represented by *make trouble*, *have a baby*, *do a job*, and the like, whose l-syntactic representations correspond to the simple transitive type [_{VP}V NP] (i.e., the same as that projected by unergative verbs). These latter do not enter into the middle construction and, by hypothesis, do not involve an “affected” argument in the relevant sense. By contrast, the l-syntactic counterpart of the VP of (36b) is that depicted in (38) below, in which the argument at issue (*these bolts*) is an internal subject:

(38)



The middle construction of English appears to be restricted to verbs which have an internal subject in this sense. This implies of course, that transitive verbs like *cut*, *break*, *crush* partake of the complex l-syntactic causative structures assumed here for the conflated denominal location/locatum verbs and for de-adjectival verbs of the type represented in (36b). And if the English middle construction is formed in s-syntax, then the relevant aspects of these structures must be "visible" at that level.

While we will assume that this account is essentially correct, there are a number of serious problems which must eventually be dealt with. We will deal with only one of these here. It concerns an aspect of the relation between middle and inchoative constructions.

5. The overlapping distribution of middles and inchoatives

The difference between inchoatives and middles is an old issue, and it is the focus of an extensive literature (e.g., van Oosten 1977, Lakoff 1977, Keyser and Roeper 1984, Jaeggli 1984, Hale and Keyser 1986, 1987, 1988, Condoravdi 1989). Why is the acceptability of the middle conditional? Why must there be some modification—modal, aspectual, an adverb, etc.—to achieve acceptability in the case of the middle, as opposed to the inchoative, which has no such requirement? In the following discussion, we will not be concerned with this time-honored problem but rather with a problem which our own system defines, namely, the distribution, across verbs, of the inchoative and the middle constructions.

The problem is this. So-called "ergative" verbs, like *narrow*, *clear*, *tighten*, all have an inchoative use, as well as the transitive, and related middle, uses:

- (39) (a) The screen cleared.
 (b) I cleared the screen.
 (c) This screen clears easily.

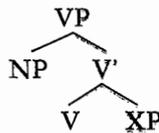
We have assumed that such verbs, in their transitive uses at least, all have the structure depicted in (38). And, we have assumed further, that this structure is, in the relevant respects, the same as that associated with location and locatum verbs. However, these verbs lack the inchoative:

- (40) (a) *The books shelved.
 (b) I shelved the books.
 (c) These books' shelve easily.

Thus, while both the middle and the inchoative, by hypothesis, involve s-syntactic movement of an internal argument, the two processes are not coextensive—the inchoative is more restricted than the middle. Why is there this difference?

We believe that the answer to this question lies in the structures of the two classes of verbs. More specifically, it is to be found in the nature of the inner predication. Our assumption to this point has been that both ergative verbs and location/locatum verbs involve an inner VP of the following form:

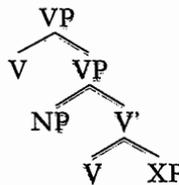
(41)



The head of XP belongs to a category which forces the appearance of a subject, hence the NP in Spec of VP. Since the two verb classes involve the same structure, there is no obvious reason for the difference they exhibit in relation to the inchoative. However, the structure depicted in (41) is overly abbreviative with respect to the content of XP. The ergative verbs we have been considering are de-adjectival, and the complement of the inner V is therefore AP. By contrast, the location and locatum verbs have PP in the complement function. This difference, we feel, is crucial.

For verbs of the ergative class, the transitive is defined by the canonical causative structure [V VP]:

(42)



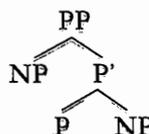
And we will assume also that the middle construction is defined on the transitive and, therefore, that it involves an abstract causative configuration in the LRS representation of verbs.

By contrast, we would like to suggest that the inchoative is based not on the transitive (causative) structure. Rather, the inchoative is simply the inner VP alone – i.e., the structure (41). This is the form of the intransitive of an ergative verb. Thus, we suggest, (39a) is simply the intransitive counterpart of the transitive which underlies (39b,c).

But if the intransitive form of an ergative verb simply lacks the upper VP, there should, in principle, be intransitive counterparts of the location/locatum verbs – these would be instances of (41) in which XP is PP. A reconsideration of the nature of the category P suggests a reason why this might be impossible.

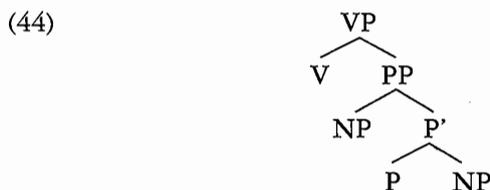
The category P has the fundamental property that it is interrelational, requiring two arguments, one a complement, the other a subject (or specifier). Most important, like the adjectival category A, prepositions force the appearance of a subject. In our initial representations of this property, we assumed that this required the use of a verb to introduce the required specifier position – the internal subject position of (42). We ignored the possibility that *both* the complement and the subject might appear internal to PP, as in (43):

(43)



However, the logic of our framework might actually be seen to require this alternative. This would be so, for example, if we supposed that the special property of the P category were necessarily acknowledged in the minimal possible structure. Its complement taking property is met, of course, in the V' phrase. And that structure immediately defines the predicate corresponding to the second property of P, i.e., that it projects a phrase requiring a subject. All of this happens internal to PP, without violating the principles of unambiguous projections and full interpretation.

We suggest that this line of reasoning is possibly correct. If it is, then, we can explain why location and locatum verbs are always transitive (or middle) and never inchoative. These verbs have the structure depicted in (44), in which V denotes a dynamic event implicating an interrelation:



Inchoatives are the intransitive counterparts of the causative structures, defined as the inner VP, bereft of the superordinate causative verb. While (44), underlying the location/locatum class, are causatives, the inner construction is not verbal – it is prepositional. Therefore, there can be no parallel intransitive counterpart to these verbs. The configuration (41) is simply absent from the LRS representation of location/locatum verbs.⁷

It is natural to ask why the A category does not also take its subject argument internally. The class of adjectives we have so far considered, we believe, are monadic – it may be a basic property of adjectives, as an l-syntactic category, that they do not take complements of the sort which force the appearance of a subject. Nonetheless, they themselves denote attributes and must be predicated of an NP. This NP is not a complement, but rather a subject. And it is a subject whose appearance is not forced by virtue of an element *internal* to AP. It must therefore appear *external* to the AP projection. This, of course, requires the use of a V projection in the LRS representation of verbs like *clear*, *narrow*, and the like. It follows, then, that these verbs have the inchoative use.

6. Concluding remarks

The purpose of this paper has been to explore the limits on (verbal) lexical items in respect to their argument structures —with a view to determining what is, and

(7) It is, of course, not obvious why the V of (44) should be a “causative” (requiring an external subject at d-structure) rather than a “raising predicate”. That is to say, why can’t the NP in the Spec of PP simply raise to Spec of VP and thence to Spec of IP in s-syntax? The second step, at least, appears to be involved in closely parallel s-syntactic “analytic” structures like *mud got on the saddle*, *paint dripped on the floor* (cf. transitive *we got mud on the saddle*, *we dripped paint on the floor*). However, the first step is impossible for location/locatum verbs, since raising (like NP-movement in general) is motivated by case theory and is therefore irrelevant to l-syntax.

what is not, a possible lexical argument structure— and, if possible, to give an explanatory account of linguistically relevant limitations on lexical forms. Extending Talmy's (1985) term somewhat, we have used the phenomenon of "conflation" as a probe into the inner organization of lexical argument structure, concluding that argument structure can be properly viewed as a *syntax*. And accordingly, it is subject to the laws of syntax, as known generally, and, in particular, it is subject to the principles determining the grammatical uses of "head movement" or "incorporation" (Baker 1988). A full attempt to account for argument structure must, we have argued, assume that the syntactic projection of lexical categories and arguments conforms to the principles of "unambiguous projection" (cf. Kayne 1984) and "full interpretation" (cf. Chomsky 1986a). We have intended to show that this is all that is needed to give a full account of the notion "argument structure". If so, then there are no linguistic mechanisms which are specific to argument structure. There is, for example, no process of "theta role assignment", apart from predication. And there are no "theta roles", apart from the lexical relations expressed in unambiguous, fully interpreted, projections of the elementary lexical categories.

At this point, the claims of the preceding paragraph represent little more than speculations, supported by suggestive, though not altogether conclusive, evidence. Further work along this line must both strengthen the evidentiary base and extend its coverage to the full range of confluations.

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