Deconstructing Thematic Hierarchies

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This paper aims to deepen our understanding of a widely adopted theoretical construct: the thematic hierarchy (TH). A TH is a ranking of a set of semantic roles, intended to reflect precedence relations among them. THs are adopted by proponents of many major theoretical frameworks, including Lexical Functional Grammar, Functional Grammar, Government-Binding and descendants, and Role and Reference Grammar, and they figure in accounts of a considerable range of linguistic phenomena in many languages, including subject and object selection, applicativization, causativization, and serialization, as well as in the statement of typological implicational generalizations.

Despite the frequent appeals to the TH, there is a lack of agreement concerning its formulation. The literature contains a plethora of instantiations of the TH, which differ in the semantic roles composing the hierarchy and the ranking of these roles. An implicit working hypothesis is that one TH is valid for all languages and all relevant phenomena, and the "right" TH will emerge from empirical investigation. Critics, however, take this variety of THs as evidence that it is impossible to arrive at a single TH and that, therefore, it makes no sense to posit such a construct.

After providing some background on the appeal and limitations of the TH in sections 1 and 2, we examine the ways in which THs should be understood. We argue that it is impossible to formulate a single TH that will cover all the generalizations that THs have figured in, since these generalizations are heterogeneous in nature. Often a TH is best understood as providing a notation—a ranking of semantic roles—for stating a generalization. This notation has been used to state a variety of generalizations, leading to different THs, but such THs do not explain the generalizations they capture, nor can they be primitive linguistic constructs. In most instances, the generalizations captured by proposed THs arise from several interacting factors, and the key to understanding the relevant THs lies in teasing apart these factors. In fact, some generalizations which appear to implicate THs actually turn out to be more accurately stated in terms of other properties, such as animacy, which are aligned in systematic ways with semantic roles.

In this context, we turn to the most widespread use of the TH: constraining the basic realization of the arguments of a verb. We suggest that in this domain there is indeed a universal ranking of semantic roles; however, the TH which expresses

this ranking is epiphenomenal and not an independent, primitive construct. Rather, this TH can be derived from the more basic elements of the lexical semantic representation of verbs. We uncover the sources of TH effects in argument realization by examining two understandings of the TH that have figured in accounts of this phenomenon, showing that each uses a distinct notion of prominence to rank semantic roles—notions that are related to two views of the nature of semantic roles themselves. We demonstrate that both notions of prominence have a part to play in subject and object selection.

1   Problems with Thematic Hierarchies

Although THs are often used to account for robust linguistic generalizations, there is some skepticism regarding the status of the TH as a linguistic construct, stemming largely from the bewildering number of formulations in the literature. We present a small sample to illustrate their variety. (In the THs below, "Agt" is agent, "Assoc" is associative, "Ben" is benefactive, "Eff" is effector, "Exp" is experiencer, "G" is goal, "Inst" is instrument, "L" is location, "Mann" is manner, "Rec" is recipient, "S" is source, "Temp" is temporal. Roles ranked together are separated by a slash. Dik's "goal" and Fillmore's "objective" are relabelled "patient" to conform to more established usage and facilitate comparison.)

(1)　　a.　　Agt > Th/Pat > G/S/L (Baker 1997)

　　　　b.　　Agt > Exp > Th (Belletti & Rizzi 1988)

　　　　c.　　Agt > Ben > Rec/Exp > Inst > Th/Pat > L
　　　　　　　(Bresnan & Kanerva 1989)

　　　　d.　　Agt > Pat > Rec > Ben > Inst > L > Temp (Dik 1978)

　　　　e.　　Agt > Exp > Inst > Pat > G/S/L > Time (Fillmore 1971)

　　　　f.　　Agt > Dat/Ben > Pat > L > Inst/Assoc > Mann (Givón 1984)

　　　　g.　　Act > Pat/Ben > Th > G/S/L > Ben (Jackendoff 1990)

　　　　h.　　Agt > Eff > Exp > L > Th > Pat (Van Valin 1990)

These and other THs differ along several dimensions. First, they may include alternate relative rankings of certain pairs of roles; for example, Fillmore ranks patient below instrument, while Givón does the opposite. Second, some THs use finer-grained roles than others. Van Valin distinguishes between agents and effectors and between patients and themes, while others do not. Some THs rank non-cooccurring roles (e.g., goal and experiencer) with respect to each other, while others do not. Some THs include only roles associated with arguments, while others also include those associated with adjuncts.

　　　There are two reactions to this diversity. Some researchers assume that a closer scrutiny of the empirical evidence will provide arguments in favor of a particular TH

(cf. the exchange between Bresnan and Kanerva (1989, 1992) and Schachter (1992)). Others merely dismiss the TH. Newmeyer, for example, concludes that "There is reason for strong doubt that there exists a Thematic Hierarchy provided by UG. That seems to be the best explanation for the fact that after over three decades of investigation, nobody has proposed a hierarchy of theta-roles that comes close to working" (2000:65).

It is necessary, however, to determine what counts as a working TH. Proposed THs can be meaningfully compared only if they are interpreted in the same way and are meant to account for the same range of phenomena. Existing THs differ in both respects. Once the interpretation given to prominence is made explicit and tied in an explanatory way to the phenomena a given hierarchy is meant to account for, it should be possible to answer questions such as whether or not a TH should only rank semantic roles of co-arguments of a verb and what the appropriate grain-size of the roles constituting a TH is. As we discuss, once the various uses of the TH notation are appropriately understood, no single TH may turn out to cover the entire range of generalizations that appeal to a TH. This conclusion, however, does not mean that a particular TH may not accurately capture the generalizations motivating it.

2 Context Dependence: One Motivation for a Thematic Hierarchy

We begin our close scrutiny of the TH by reviewing a major motivation for positing it: "context dependence" in the realization of arguments. There often is no one-to-one correspondence between an argument's semantic role and its morphosyntactic realization; its realization often depends on the roles of cooccurring arguments. As we show, the TH is well-suited for capturing such context dependence.

This point can be illustrated with the widely-cited paradigm in (2), which is the basis of Fillmore's (1968) subject selection rule in (3), subsequently reformulated in terms of a TH.

(2)   a.   The door opened.

        b.   Dana opened the door.

        c.   The chisel opened the door.

        d.   Dana opened the door with a chisel.

(3)   If there is an A [=Agent], it becomes the subject; otherwise, if there is an I [=Instrument], it becomes the subject; otherwise, the subject is the O [=Objective, i.e., Patient/Theme]. (Fillmore 1968:33)

These data illustrate context dependence as the expression of *the door* depends on whether there is a cooccurring agent or instrument role and, similarly, the expression

of the instrument depends on whether there is a cooccurring agent. These observations are naturally captured by the TH in (4) together with a subject selection rule that states that the argument of a verb bearing the highest-ranked semantic role is its subject.

(4)   Agent > Instrument > Patient/Theme

TH-based accounts, then, allow reference to arguments in terms of the relative ranking of their semantic roles, obviating the need to refer explicitly to specific semantic roles. This property facilitates more general accounts of various linguistic phenomena. In fact, the just-posited subject selection rule in conjunction with the TH in (5) will account for Speas's (1990:73) observation that recipients can be subjects only when not in the presence of an agent, as shown in (6).

(5)   Agent > Recipient > Theme

(6)   a.   Alex received a package.

        b.   Sam sent Alex a package.

A somewhat different form of context dependence is found in Polinsky and Kozinsky's (1992) study of applicatives and causatives in Kinyarwanda. They note that whether an "oblique" argument or a causee can be the first of two objects of an applicative or causative verb depends on cooccurring "oblique" arguments (the second object is the verb's "own" object). They propose that in instances of cooccurrence, the argument ranked higher in the TH in (7) is expressed as the first object.

(7)   recipient > benefactive > possessor > causee > instrument > comitative
        (Polinsky and Kozinsky 1992: 440, (40))

This hierarchy, for instance, captures the observation that a benefactive has priority over an instrument for expression as first object, with the instrument expressed as an oblique PP.

Context dependence also has prompted reference to THs in the statement of crosslinguistic generalizations about argument realization (Dik 1978, 1997; Givón 1984). "Deep" ergative languages aside, all languages allow a verb's agent to be expressed as subject, but differ as to whether other arguments may be expressed as subject in the absence of an agent. Similarly, all languages allow patient/themes as objects, but vary as to which other non-agent arguments can also be objects. Dik (1978) and Givón (1984) propose that the constraints on variation can best be described through reference to a TH. Languages choose semantic roles that can be realized as subjects or objects from a continuous portion of the TH starting with the agent for the subject and the second-highest role for the object and working

downwards—what Dik calls the Continuity Hypothesis (1978:76). As Dik illustrates, languages may differ in their choice of cut-off points for subjecthood or objecthood on the TH. Thus, assuming the TH in (8), all languages have agent subjects, some might have agent and patient subjects, others agent, patient and recipient subjects, and so on. None, however, would have patient, recipient, and instrument subjects only. Similarly, according to (8) a language would allow benefactive objects only if it allows patients and recipients also to be objects.

(8)   Agt > Pat > Rec > Ben > Inst > Loc > Temp (Dik 1978: 70, (3))

These typological generalizations apply across languages, defining a set of possible languages with respect to the options for the realization of various semantic roles as subject and object. In contrast, the instances of context dependence discussed earlier involve priorities among a verb's co-arguments with respect to their potential realization as subject or (applied) object. So, while Dik's generalization states that a language only allows recipient subjects, if it also allows agent and patient subjects, the other type of generalization involves whether a recipient may be realized as the subject of a particular verb in a language which allows such subjects. The ranking of semantic roles relevant for one purpose may not be relevant for the other. Recognizing that different kinds of generalizations capture context dependence over distinct domains is crucial for understanding why various THs have been proposed.

3   Deconstructing Thematic Hierarchies

The key to understanding the myriad instantiations of the TH lies in teasing apart the factors which underlie the generalizations captured by particular hierarchies, as we show in this section and the next. Before attempting to show this, we mention some complicating issues that must be recognized in any comparative evaluation of THs, so they can be set aside. First, two THs can be compared only if any semantic roles they both include have the same extension, yet this is often not the case. One theory of semantic roles may use a particular label more broadly than a second; differences in grain-size are particularly prevalent with the notions "goal", "theme", and "patient". Second, a TH interacts with other constructs and assumptions of the larger linguistic theory it is integrated into. Some variation in the placement of a particular semantic role across THs might be traced to such interactions and may lack empirical consequences. For instance, whether the TH is used with a monostratal or multistratal syntactic theory can have repercussions for role ranking, as we mention below. Furthermore, the choice of semantics-to-syntax mapping algorithm and the ranking of semantic roles in a TH are mutually dependent, and some disagreements about the statement of the TH may stem from this interdependence. Fuller discussions of these issues is found in Levin and Rappaport Hovav (in press).

Sometimes THs simply provide a concise way of stating a particular general-

ization which arises from a conspiracy of independent factors and should not be confused with the explanation for the generalization. For instance, Polinsky and Kozinsky (1992:440) write that their TH, cited in (7) "is simply a generalization of the empirical regularities discussed". To illustrate this we scrutinize hierarchies which differ as to whether or not benefactives and recipients are ranked together and as to whether these roles are ranked above or below patient/theme. These differences can be understood in the context of a survey of the expression of these roles in and across languages.

Many languages allow recipient and benefactive arguments to be expressed not only as adjuncts, but also via a "core" grammatical relation, e.g., as first object in a double object construction (e.g., English) or as a dative case-marked NP (e.g., German). Since they both show the same core expression, a recipient and a benefactive cannot cooccur (*I mailed Mom Pat the letter), so a statement about the ranking of these roles relative to, say, patient/theme does not have to distinguish between them. Other generalizations, however, must treat them differently. One example is Polinsky and Kozinsky's (1992) generalization about which role has precedence in access to direct object expression in applicatives; a second is Dik's (1978, 1997) generalization about the likelihood that NPs bearing particular roles will be subjects or objects crosslinguistically (see section 2).

Turning now to the ranking of recipient and benefactive with respect to patient/theme, Dik (1978, 1997) ranks these two roles below patient/theme to capture the generalization that all languages allow patient/theme direct objects, but only some allow recipient or benefactive objects (at least in terms of surface "coding" in the sense of Keenan (1976)). Furthermore, patient/themes are typically the subjects of unaccusative intransitive verbs, but no language allows recipient or benefactive subjects of "unaccusatives" (Baker 1996, 1997). Since Dik wishes to capture the likelihood of a semantic role being associated with both subject and object in a single TH within a monostratal framework, patient/theme needs to be ranked above recipient or benefactive, since subject and object are chosen working down from the top of the TH.

In contrast, Givón (1984) posits the reverse ranking: recipient (his "dative") and benefactive are higher than patient/theme. This ranking reflects a concern with language-internal interactions in the realization of arguments bearing particular semantic roles. It is well-known that recipients and benefactives often usurp from patient/themes certain of the coding properties of direct objects, such as control of object agreement on the verb, closeness to the verb, and promotion to subject under passive. Givón's ranking appears to express the likelihood that NPs bearing these semantic roles show these properties. When a patient/theme and a recipient or benefactive both bear core grammatical relations, the recipient or benefactive is more likely to show these coding properties. For example, in the English double object construction the recipient or benefactive appears immediately after the verb and is the derived subject in the related passive.

The point to stress is that the facts that Dik is interested in and those that Givón is interested in cannot be captured by a single TH, although specific THs can be formulated to express each generalization. Such THs, however, must be considered convenient shorthands for stating the relevant generalizations; they are not primitive constructs which figure in the explanation of the phenomena. In the final analysis, a deeper explanation for the range of facts must be found; we now speculate on what it might be.

Recipients and benefactives have coding properties that motivate Givón to rank them together and above patient/theme. The reason, probably, is that recipients and benefactives are typically animate, while patient/themes are not. Animates are more likely to be topical than inanimates, and it is topical NPs that tend to show these coding properties. In fact, crosslinguistically, there are various factors which determine which of two objects in a double object construction have these coding properties, including animacy and definiteness. Thus, ultimately the observations underlying Givón's ranking have their source in animacy considerations, and semantic roles and—hence, the TH—are only indirectly implicated (cf. Evans 1997). Why do Dik's and Polinsky and Kozinsky's generalizations rank recipient above benefactive? Perhaps, they distinguish recipients from benefactives because recipients, but not benefactives, are arguments of their verb (cf. Polinsky and Kozinsky 1992:440) and, hence, more likely to become objects. We speculate that the ranking of patient/theme above recipient and benefactive in Dik's hierarchy for the purposes of subject and object selection has its roots in the fact that recipients and benefactives are usually expressed with dedicated "semantic cases", while patient/themes are not. Hence, patient/themes are more likely to be basic direct object across languages, and only languages which have some means of "advancing" recipients and benefactives to direct object will have them as objects.

4   The Thematic Hierarchy in Argument Realization

The assumption that the TH is a primitive linguistic construct is most often made in conjunction with TH-based accounts of how the arguments of a given verb can be syntactically realized—perhaps, the best known use of the TH. The TH is used to define constraints on argument realization, allowing attested and precluding unattested pairings of semantic roles with grammatical relations. However, in most recent work semantic roles are taken to be derived notions, so that a TH, as it is composed of semantic roles, should also be derived. Semantic roles are essentially labels for classes of arguments; there are two major approaches to defining these classes in terms of basic elements of the lexical semantic representations of verbs. These two approaches to understanding semantic roles dovetail with two distinct understandings, pointed out by Bresnan and Kanerva (1989:23-24), of what the ranking of roles in a TH represents. We show each understanding of the ranking derives from the associated understanding of semantic roles. The TH, then, turns out to be epiphenomenal, derived from the basic elements of lexical semantic rep-

resentation; nevertheless, these elements should, in principle, give rise to a clear ranking of semantic roles.

One way of understanding the derivative status of semantic roles takes them to be labels for positions in an "event structure"—a structured representation of an event, usually taking the form of a predicate decomposition. Prominence relations among arguments, defined in terms of positions in the predicate decomposition, induce a ranking of the corresponding semantic roles and, thus, give rise to a TH. The TH, then, reflects the relative depth of embedding of semantic roles in the event structure (e.g., Jackendoff 1990). There is a second instantiation of the idea that prominence relations reflect the internal "structure" of a verb's own meaning, which is cited by Bresnan and Kanerva (1989) in introducing the two conceptions of the TH: the TH reflects the order of composition of arguments with their verb (e.g., Larson 1988). In fact, order of composition is meaningful only if it reduces to depth of embedding. The reason, as Kratzer (1996) points out, is that alternative orders of composition of the arguments of a single predicate have no detectable semantic effect. Therefore, it is not surprising that some researchers suggest that the TH reflects both depth of embedding and order of composition of arguments (Kiparsky 1987, based on Wunderlich 1977).

A TH thus defined is not an independent construct, but a generalization over possible event structures. Each event structure defines a set of semantic roles that may cooccur as arguments of verbs—one of the pluses of defining roles over event structures. The inventory of event structures, then, determines the possible sets of cooccurring roles, and, thus, what sets of roles may be ranked. Roles that do not cooccur as arguments of a verb do not appear in the same event structure and, thus, cannot be ranked with respect to each other. Since semantic roles name argument positions in an event structure and there are taken to be fairly few event structures involving a small set of rather general predicates, the posited semantic roles are fairly coarse-grained. For example, a frequently posited predicate is CAUSE, and its first argument is taken to define a semantic role. Although this role is usually identified as "agent" (e.g., Jackendoff 1972), it is probably more accurate to label it "causer" since the first argument of this predicate is not filled only by agents in a strict sense; for some verbs, it could also accommodate natural forces and certain instruments (Baker 1997; Van Valin and Wilkins 1996). The label "agent" in THs of this type is then best viewed as a stand-in for all the "roles" which can appear as first argument of CAUSE. More generally, any semantic role figuring in such a TH may be a stand-in for what are several related finer-grained roles in other types of THs.

Structurally-based THs are usually appealed to by researchers who assume that the semantics-to-syntax mapping "preserves" prominence relations between arguments: "Constituent structure at D-structure represents (the) semantic compositionality (of events)", to quote Marantz (1993:143). Such THs figure in generalizations about the relative prominence of arguments in the syntax, as in Larson's statement that "the lowest role on the Thematic Hierarchy is assigned to the lowest

argument in constituent structure, the next lowest role to the next lowest argument, and so on" (1988:382).

If "order of Th-roles is a reflection of their semantic depth" (Kiparsky 1997:484), then an independent criterion is needed to establish when one argument of a multiargument verb is more embedded than a second. Clearly, when such a verb has a complex event structure, comprised of one event embedded in a second, then an argument of the higher event is less embedded than an argument of the lower event and should outrank it in the TH. A range of evidence has been adduced for attributing a complex event structure to causative verbs, such as *break* or *kill* (Dowty 1979; McCawley 1973; Morgan 1969; von Stechow 1995, 1996). In such an event structure the caused event containing the patient is embedded under the predicate *cause*, which also takes the causer as an argument, justifying the ranking of causer over patient.

However, there is no independent way to establish the relative ranking of arguments of a multiargument verb with a simple event structure, including the two arguments of non-causative verbs like *have, love, see, want, scratch,* and *wipe.* One argument of such verbs is realized as subject and the other is not, suggesting a prominence relation between them, yet their relative ranking cannot be established independent of their morphosyntactic realization, which is what the ranking is supposed to predict. For example, this understanding of the TH cannot explain why it is the experiencer rather than the stimulus argument of verbs like *see* or *love* that is realized as subject, since there is no embedding relation between these two arguments in a typical event structure, and, thus, in this and comparable examples there is no way to rule out certain unattested pairings of semantic roles with grammatical relations. Although the inability to handle such examples proves a serious limitation of the structural understanding of the TH, there is a second way of understanding the derived status of semantic roles, which can be used to supplement the first, as it can impose a ranking on arguments when event structure position fails to.

The second approach to semantic roles takes them to be defined in terms of sets of lexical entailments imposed by verbs on their arguments by virtue of the parts they play in the events the verbs describe. Dowty's notion of proto-role is perhaps the best-known instantiation of this approach (Dowty 1991; Ackerman and Moore 2001; Primus 1999). Semantic roles, then, represent clusters of "event-based" properties of arguments, with each of these properties contributing in its own way to the ranking of arguments, and, hence, to the place of the semantic roles defined over them in a TH. For instance, as some researchers (Dowty 1991:574; Croft 1998:37; Koenig and Davis 2001:83; Primus 1999:52–53) have noticed, several of the entailments included under Dowty's Agent and Patient Proto-roles come in pairs: the Agent Proto-role entailment "causing an event or change of state in another participant" can be paired with the Patient Proto-role entailment "undergoes change of state" and the Agent Proto-role entailment "movement (relative to the position of another participant)" can be paired with the Patient Proto-role entailment "stationary relative to movement of another participant". These paired entailments arise

because of asymmetric relations between participants in certain types of events, and, thus, they implicitly define a ranking of arguments (Primus 1999). Lexical entailments, then, may be involved in defining prominence relations, and, consequently, the TH may be seen as the "cumulative result of interacting relative prominence relations among semantic entities" (Mohanan 1994:28). This idea finds its roots in the work of Fillmore (1977:102), who suggests that the TH he proposed in earlier work (Fillmore 1968, 1971) should be replaced by the following series of rankings.

(9)   a.   An active element outranks an inactive element.

          b.   A causal element outranks a non-causal element.

          c.   A human (or animate) experiencer outranks other elements.

          d.   A changed element outranks a non-changed element.

          e.   A complete or individuated element outranks a part of an element.

          f.   A 'figure' outranks a 'ground'.

          g.   A 'definite' element outranks an 'indefinite' element.

The properties of arguments that Fillmore recognizes, as well as a comparable set proposed by Mohanan (1994:28), overlap considerably with the entailments that constitute Dowty's (1991:572) Agent and Patient Proto-roles. This overlap suggests that there is agreement concerning the semantic elements that matter most for argument realization.

The question is what "prominence" means in statements such as those in (9). Fillmore (1977) sees such statements as specifying the relative "salience" of various event participants. Thus, on the view that semantic roles are defined by sets of lexical entailments, a TH made up of such roles would represent a conflation of the effects of such statements. That is, roles would be ranked not in terms of their position in an event structure, but rather in terms of the semantic components that contribute to "salience" or perhaps "topicworthiness". In fact, Givón (1984) and Hawkinson and Hyman (1974), among others, see the TH "as representing a scale of discourse topicality of argument types rather than an order of semantic composition" (Bresnan and Kanerva 1998:23-24). On this understanding, the TH is seen as similar to various natural prominence scales, such as those in (10), which have been appealed to in accounts of a wide range of linguistic phenomena, including coding properties of arguments, such as word order and morphological case.[1]

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[1]The natural prominence scales in (10) rank properties of the NPs that fill semantic roles (or what Evans (1997) calls the "cast"); in contrast, a TH ranks semantic roles, which involved "event-based" properties of NPs—properties entailed by the event described by the verb. It is perhaps for this reason that these natural prominence scales figure in accounts of somewhat different phenomena than the TH; see Levin and Rappaport Hovav (in press). Furthermore, one reason why the semantic properties referred to in Fillmore's statements in (9) do not all find analogues in Dowty's and Mohanan's work is that Fillmore makes reference to properties of the fillers of semantic roles, as well as to event-based properties.

(10)   a.   PERSON: first, second > third

         b.   REFERENTIALITY: pronoun > proper name > common noun

         c.   ANIMACY: human > animate > inanimate

         d.   DEFINITENESS: definite > specific > non-specific

In the scales in (10), prominence is understood as akin to "cognitive salience" (Mc-Carthy 2001; Newmeyer 2000) or "topicality" (Givón 1984), where these are determined on the basis of some semantic properties of NPs.

We have introduced two conceptions of semantic roles, reflecting two perspectives on the lexical semantic representation of verbs, each of which allows a ranking to be imposed on semantic roles. We have already shown that semantic roles cannot be exhaustively ranked for purposes of argument realization solely on the basis of the "structure" of event structure. We now consider whether semantic roles can be ranked for these purposes by the event-based entailments that underlie them. We show that these entailments do have a contribution to make, but that argument realization also requires reference to the geometry of event structure.

As noted above, there is considerable agreement concerning the event-based entailments that figure in argument realization. However, a careful consideration of the entailments making up Dowty's Agent Proto-role (1991:572) reveals that not all of these entailments are equally important. Specifically, causation outranks Dowty's other Agent Proto-role entailments in determining subjecthood (Davis and Koenig 2000:75-76). For example, in languages with productive morphological causativization, the introduced causer invariably becomes the subject of a complex causative event, regardless of the number of Agent Proto-role entailments carried by the causee—the base verb's subject argument. Specifically, the new causer is the subject, even if the base verb requires that its subject be sentient, as in the Hebrew example (11a) or, even sentient and volitional, as in the Finnish example (11b).

(11)   a.   Ha-b'dixa hicxika oti.
            the-joke laugh.CAUS I.ACC
            'The joke made me laugh.'

         b.   Uutinen puhu-tt-i nais-i-a pitkään.
            news.item talk-CAUS-PAST woman-PL-PART long-ILL
            ' The news made the women talk for a long time.'
            (Davis and Koenig 2000: 75, (26))

And, as the pair in (12) shows, causation also takes priority over another Agent Proto-role entailment, motion: a moving participant is the subject only when there is no causer (Dowty 1991).

(12)   a.   The train passed/crossed the border.

b.   The wind blew the napkin off the table.

This data suggests that causation outranks all the other Agent Proto-role entail-
ments in subject selection. We now propose an explanation for this observation.

Among Dowty's Agent Proto-role entailments, causation is the only one that
corresponds to a notion that is readily definable in most proposed event structures.
We suggest its importance to subject selection follows if prominence relations in the
event structure are preserved in argument realization. A causer argument, being the
least embedded in a typical causative event structure, would always take precedence
over any other argument, no matter what its semantic properties, for the purposes of
subject selection. In this way, the relative embedding relations between arguments
in a valid event structure are preserved in the syntactic realization of the arguments
of a verb; in the syntax the relations could be defined by c-command in a constituent
structure or by a hierarchy of grammatical relations.

Although event structure plays an important role in subject and, most likely,
object selection,[2] other event-based statements of prominence come into play where
event structure is inadequate. For instance, when two arguments are at the same
level of embedding in the verb's event structure, as with *see* or *love*, semantic promi-
nence, as defined by a set of statements such as Fillmore's in (9), determines their
relative syntactic prominence. Many of the properties identified by Dowty, Fillmore,
and Mohanan lack analogues in typical event structures; they often differentiate
among the finer-grained instantiations of the coarse-grained roles defined by posi-
tions in event structure. The use of such event-based properties allows semantic roles
to be broken down into smaller components that interact in argument realization.

In this section we have shown that a TH used for determining the options for
realizing the arguments of a given verb can be derived from more basic properties
of the lexical semantic representation of verbs; it should not be considered a prim-
itive construct. Presumably, such a hierarchy should be universal, with languages
agreeing on the relative ranking.[3] However, as discussed in previous sections, other
posited THs, used as statements of various generalizations over semantic roles, may
rank roles in a different way.[4]

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[2]Dowty proposes a set of Patient Proto-role entailments relevant to object selection. Although
we do not go into detail here, there is evidence that of these entailments, "changes state" outranks
the others. Interestingly, this entailment too has a place in most proposed event structures, as they
typically include a predicate such as BECOME or CHANGE.

[3]It is possible that crosslinguistic differences in the options for the morphosyntactic expression
of arguments may suggest that languages have different rankings; however, we suggest that the
rankings are the same, but the differing morphosyntactic options available may obscure this. See
Levin and Rappaport Hovav (in press) for discussion.

[4]Almost without exception, THs, no matter what generalization they are intended to capture,
rank agent highest—a ranking which surely requires an explanation. We speculate that every TH,
in the final analysis, encodes some form of prominence and that agents, which are defined by a
convergence of many of the properties contributing to high prominence (e.g., Givón's (1984) cluster
concept definition of agency), will necessarily be ranked highest in any hierarchy.

5   Conclusion

We conclude by returning to the TH posited to account for Fillmore's well-known subject selection paradigm, 'Agent > Instrument > Patient', and show that it too cannot be a universal primitive construct. First, a purely "structural" interpretation is inappropriate for this TH, as it does not capture the syntactic c-command relations among the NPs bearing the roles included in this TH. Sentences with a morphologically basic verb that include an agent, an instrument, and a patient never have the instrument structurally more prominent than the patient. Yet, this TH does not qualify as a natural prominence scale either as instruments are almost always taken to be less "cognitively salient" than agents and patients.

Most likely, this TH conflates two distinct semantic criteria. The verb *break*, used to exemplify Fillmore's subject selection paradigm, is a dyadic change of state verb, taking causer and patient arguments. The causer argument can be "filled" by an agent, instrument, or natural force (see section 4). The ranking of agent over instrument indicates that when the causer argument is instantiated with an instrument, the expression of an agent is not possible, while the choice of agent as the causer argument does not preclude the expression of an instrument. The ranking of agent and instrument above patient could be given a structural prominence interpretation, by stipulating that causers are always more prominent than patients in syntactic structure. In sum, this TH aptly captures the generalizations behind Fillmore's paradigm, but is not a primitive linguistic construct.

This case study highlights once again the major points of this paper. Every posited TH is worthy of serious scrutiny since it represents an attempt to capture a linguistic generalization. Although a range of generalizations are statable with the same TH notation, these generalizations fall into quite different types. They neither can, nor should, be given a single explanation. Yet, taken individually each generalization and, concomitantly, each proposed TH, have much to contribute to our effort to understand how language works.

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