

6. Incremental Theme

Besides narrowing the class of role data, our focus on argument selection will also require us to widen our scope to include a new role category I will call *Incremental Theme*. Though the key idea of this section was once sketched in a talk (Dowty 1987) suggested by proposals in Hinrichs (1985), this idea was independently noticed and most fully developed formally by Manfred Krifka (Krifka 1987, 1989). This proposal is that the familiar way in which the aspect of telic predicates (or *accomplishments* and *achievements*) depends on their NP arguments (Verkuyl 1972, Dowty 1979) can be captured formally by the principle that *the meaning of a telic predicate is a homomorphism from its (structured) Theme argument denotations into a (structured) domain of events*, modulo its other arguments. *Homomorphism* is a standard mathematical notion which is finding more and more applications in linguistics, e.g. Montague (1970) Keenan and Faltz (1985). Put simply, a homomorphism is a function, from its domain to its range, which preserves some structural relation defined on its domain in a similar relation defined on the range. (See Partee et al 1990 for formal discussion.) In the case of telic predicates, this relation which is preserved is the "part-of" relation: If x is part of y , then if a telic predicate maps y (as Theme) onto event e , it must map x onto an event e' which is part of e .

For example, take the telic event described by *mow the lawn*: if I tell my son to mow the lawn (right now), and then look at the lawn an hour later, I will be able to conclude something about the "aspect" of the event of his mowing the lawn from the state of the lawn, viz., that the event is either not yet begun, partly done but not finished, or completed, according to whether the grass on the lawn is all tall, partly short, or all short. On the other hand, I will not necessarily be able to inspect the state of my son and conclude anything at all about his completion of his mowing the lawn. In this event, my son is the Agent and the lawn is the Theme, in fact the Incremental Theme. The homomorphism claim means that because of the meaning of *mow*, the state of parts of the lawn and their part-whole relationships are reflected in the parts of the event of mowing it and ITS part-whole relationships.¹

The hypothesis that telic predicates are homomorphisms neatly explains Verkuyl's (1972) long-standing puzzle about the way that bare plurals and mass term arguments can make a sentence with a telic predicate behave as if were "durative"

¹ Note that the claim is NOT that telic predicates denote functions that are also one-to-one, i.e. *isomorphisms*. A homomorphism can be a many-one function. Thus the claim that *eat* denotes a homomorphism from its object argument denotation to an event is not counterexemplified by a situation in which I eat a whole sandwich in one gulp (all parts of the sandwich mapped onto the same event) instead of the more usual one in which different parts of the sandwich are mapped by the eating event into the distinct sub-events of eating the respective parts. And, this also implies, the part-of relation is not understood as "is a proper subpart of" but rather, so as to allow a thing to count as a part of itself.

or "imperfective" in aspect, as in the familiar examples (19):

- (19) a. John drank a glass of beer. ["perfective"]
b. John drank beer (for an hour). ["durative"]

The NP *A glass of beer* refers to an entity that has various proper subparts that are of course quantities of beer of various sizes, though no one of these is itself a GLASS of beer: if *drink*, a telic predicate, is a Theme-to-event homomorphism, it maps this argument denotation into an event of drinking a glass of beer, and maps the subparts of this quantity of beer into sub-events of drinking subquantities of that beer, but it also follows that none of these proper subevents is an event of drinking a GLASS of beer. If we follow Bennett and Partee (1972), Taylor (1977), Dowty (1979) and later writers in defining a telic sentence as one denoting a unique event, i.e. one having no proper subevents describable by the same sentence, then (19a) is telic. Example (19b) is similar, and of course has the very same homomorphic predicate mapping some quantity of beer and its subparts into a corresponding event and its subevents: the difference is that the NP *beer* does not specify a definite quantity of beer, so subquantities of the main quantity could also be referred to by this same NP *beer*. This implies that the subevents which make up the main event are describable by the same core sentence, i.e. *John drink beer*, so this sentence, unlike (19a), can simultaneously describe an event and sub-events of that same event: hence (19b) is not a telic sentence and it (but not (19a)) can be felicitously and truthfully modified by a durative adverbial *for an hour* (which requires (Dowty 1979:332-334) that there are multiple successive occasions on which its core sentence is true). See Krifka (1987:13-19, 1989) for more detailed discussion of this analysis.

Examples of Incremental Themes are traditional "effected objects", "destroyed" objects, and objects entailed to undergo a DEFINITE change of state:

- (20) build a house, write a letter, perform a sonata;
destroy a presidential finding, eat a sandwich;
paint a house, polish a shoe, proofread an article;

But it turns out that many traditional Themes, i.e. things entailed to "move or undergo a change of state", are not Incremental Themes. For example, the objects in *push a cart*, *raise the thermostat*, *dim the lights* move or change, but the verbs by themselves imply only an INDEFINITE change of position or state (and they are atelic). On the other hand, many achievement verbs entail a definite change in one of their arguments but are not homomorphic (*die*, *touch the finish line*, *recognize a face*), except in a trivial sense, since by normal criteria their arguments never undergo this change in distinguishable separate stages, i.e. subevents. Therefore it

would be both an undergeneralization and an overgeneralization to identify Incremental Themes with cases in which the direct object referent is "totally affected or effected". A different situation is presented by the examples in (21):

(21) walk from the bank to the post office, drive (a car) from New York to Chicago, run a mile;

grow into an adult, become an architect.

If John drives from New York to Chicago, John necessarily undergoes a definite change of location from one place to the other, but if this trip were interrupted before it was finished, we would not infer that part of John has arrived in Chicago while the rest of him is still in New York.

Upon reflection, it is clear that what is partially but not totally affected in this case, in a way parallel to the themes in (19), is the **path** John traverses in driving from NY to Chicago: if the event is started but not completed, then part of this path has been traversed by John, not all of it, but the positions of parts of JOHN of course remain intact with respect to each other. We could distinguish the Themes in (21) by a new term *Holistic Themes*: though they undergo a change of state in stages, the change is "incremental" only because of some relationship they bear to the true Incremental Theme, not because they undergo a change part by part. One interesting thing about such examples is that the "argument" with respect to which these telic predicates are homomorphisms on this hypothesis, namely the Path argument, is (like Jackendoff's "Theme" in the verb *butter*) not a syntactically realized argument at all; the prepositional phrases *from New York* and *to Chicago* refer to the beginning and end points of the Path. However, an Incremental Path Theme can be syntactically realized as a Direct Object in semantically parallel telic examples like *cross the desert*, *traverse the United States (in six days)* or *drive the Blue Ridge Skyway (from beginning to end)*. Similar observations about Holistic Themes apply to the last examples in (21), *John was becoming an architect but was interrupted before he could finish his degree*, etc., though here the "Path", if we want to call it that, is even more removed from syntactic expression---the stages that one goes through to reach the status of architect were partly but not exhaustively achieved; NOT "part of John but not all of him has become an architect".

Yet a different manifestation of Incremental Theme appears in (22), which we can call a *Representation-Source Theme*:

- (22) photograph a scene
- copy a file
- memorize a poem
- read a book

To see the point of these, compare them with their (near) paraphrases in (23):

- (23) take a photograph of a scene
- make a copy of a file
- form a memory of a poem
- acquire the information in a book (from it)

The direct objects in (23) are effected objects and Incremental Themes; they denote representations, of some kind or other, of the things mentioned in the following prepositional phrase. The prepositional objects in (23) and the direct objects in the respective paraphrases in (22) are not traditional Themes, in that they refer to things which are not effected (or affected) by the relevant action. They are however like Incremental Themes in an indirect way: since representations have parts which reflect the structures of the objects they represent, an incompletely produced representation may well be a representation of a proper part of the object to be represented, so the structure of the source object can be indirectly reflected in the event of producing the representation. For this reason, the representation-source arguments which are the sole object NPs in (22) act as de facto Incremental Themes there.

Some of the examples in the literature on aspect and aktionsart involve plural or quantified NPs in one or more positions that are like Incremental Themes in their apparent homomorphic relationship to events, yet a singular NP with the same verb does not seem to denote a (non-trivial) homomorphic semantic function:

- (24) a. John visited Atlanta
- b. John visited 25 cities (in two weeks)
- c. 2,500 tourists visited Atlanta (in two weeks).
- d. It took 15 tourists a half an hour to visit all 10 Photo Sites in the park.

That is, if we imagine the event in (b) to be interrupted without being completed, we might expect John to have visited some but not all of the 25 cities, and similarly in (c), that some but not all visitors made their visits; in (d), the completion of all 150 visits is at issue. But neither subject nor object works this way in (a). Apparently, a quantified NP argument along with almost any distributive telic verb (and some collective telics) can be understood homomorphically, because this combination generates reference to a set of individual events, one for each entity referred to by the quantifier. It is the

"meta-event" combining all these individual events that has sub-parts corresponding to the individual entities picked out by the quantifier NP. However, it turns out that only those NP arguments that are Incremental Themes even when singular will be relevant for argument selection---i.e. those cases where incremental themehood is entailed by the meaning of the predicate itself---so I will reserve the term *Incremental Theme* for that narrower class of cases, excluding ones like (24b-d).

Tenny (1987, 1988) has independently called attention to the way certain NPs "measure out the event" named by a verb, but it is clearly the same phenomenon as that discussed here, her term "aspectual delimitedness" replacing the more traditional term "telicity" used here. (Cf. also Hopper and Thompson 1980 and Rappaport and Levin 1988.) However, her description differs from the present one in that (i) she does not associate the phenomenon with thematic roles in general, but claims aspect as a semantic category is unique in this kind of syntactic association with arguments, which (ii) she maintains is exclusively with DIRECT OBJECT arguments ("internal arguments"), cf. Tenny (1987:179). I believe the latter is not correct, however. Transitive verbs like those in (25),

- (25) a. John entered the icy water (very slowly).
b. The crowd exited the auditorium (in 21 minutes)
c. Moving slowly but inexorably, the iceberg took several minutes to pierce the ship's hull to this depth.

and similar verbs such as *reach*, *leave*, *depart*, *abut*, *abandon*, have Incremental Theme subjects. Their meanings treat the stationary threshold or boundary traversed (and the direct object referent) as a line or plane rather than a region but allow that a space-occupying body (the subject referent) traverses it gradually, which means the subject is an Incremental Theme. Verbs like *cross* (*penetrate*, *permeate*, *pass*, *skirt*, etc.) allow either the thing traversed (as in (26a)), the moving body (26a), or both (26c), to be regions (and therefore Incremental Themes):

- (26) a. She crossed the desert in a week.
b. At the turtle race, the winning turtle crossed the finish line in 42 seconds.
c. It took Hurricane Archibald 3 1/2 hours to cross the Florida peninsula.

Also, as noted above, a prepositional phrase as well as a direct object can express an Incremental Theme (*She walked across the desert in a week*). Many intransitives also have Incremental Theme subjects, such as *emerge*, *submerge*, *deflate*, *bloom*, *vaporize*,

decompose, etc.² The phenomenon thus belongs in the realm of partial correlation of lexical meaning with argument configuration, not general compositional semantics. Despite the fact that Incremental Theme has not been counted within the traditional canon of thematic roles, I can see no good reason to exclude it if we begin from the position that any semantic factor which argument selection can be influenced by should be counted under this rubric: as will emerge even more clearly below, Incremental Theme is definitely in this category.

² I.e. the achievement verbs which entail a complex rather than simple change of state, also a subclass of the Unaccusative predicates (Rosen 1984). I call attention to the transitives with incremental subjects in (25) and not just the intransitives, because some will suggest that the subjects of the unaccusatives are derived by Unaccusative Advancement from underlying direct objects, hence at that level conform to the claim that all Incremental Themes are direct objects. This is less plausible for *John entered the water (gradually)*, which has a visible, independent direct object. Even here, of course, one can imagine it being suggested that *the water* originates as an underlying oblique and is advanced to direct object after *John* is advanced from direct object to subject. At that point, of course, one would have a right to ask whether the invariant association of Incremental Theme with syntactic direct object still had any empirical content or had been elevated from empirical hypothesis to methodological assumption, i.e. that one was in actuality prepared to postulate any syntactic abstractness necessary to maintain a uniform semantic association with a certain syntactic position---in other words, the methodology of generative semantics (and perhaps some contemporary theorists), where meaning is the decisive arbiter of the deepest underlying structure and indirect syntactic argumentation is sought post hoc to justify analyses suggested by such assumptions about semantic connotations of deep structure.