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Themes, Cumulativity, and Resultatives: Comments on Kratzer 2003

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According to Kratzer (2003), the thematic relation Theme, construed very generally, is not a ''natural relation.'' She says that the ''natural relations'' are ''cumulative'' and argues that Theme is not cumulative, in contrast to Agent. It is therefore best, she concludes, to remove Theme from the palette of semantic analysis. Here I oppose the premises of Kratzer's argument and then introduce a new challenge to her conclusion, based on the resultative construction in Mandarin. The facts show that Theme and Agent are on equal footing, insofar as neither has the property that Kratzer's conjecture requires of a natural relation.

Keywords: thematic relations, cumulativity, event mereology, resultative construction, Mandarin Chinese

1 Introduction

According to Kratzer (2003), the thematic relation Theme, construed very generally, is not a ''natural relation.'' She says that the ''natural relations'' are ''cumulative'' and argues that, while Agent is cumulative, Theme is not. It is therefore best, she concludes, to remove Theme from

the palette of semantic analysis: as a rule, no lexical item or syntactic relation should have Theme in its interpretation.[1]

I review the substance of this proposal in sections 2 through 4, indicating premises that strike me as wrong, to do with the mereology of events. I then pursue a particular empirical challenge in section 5, from the resultative construction in Mandarin. Resultatives offer what may be the clearest case in which to test Kratzer's hypothesis, and in English, they seem to provide it with ideal support. But Mandarin shows this support to be illusory, and the hypothesis to be wrong, by disentangling thematic relations that are confounded by the grammar of English. Relative to the events in their domains, Agent and Theme relations do not contrast in cumulativity, so we cannot dismiss Theme on these grounds. I conclude briefly in section 6.

2 Cumulativity and Naturalness

Kratzer (2003) proposes that ''cumulativity'' is a property of any ''natural relation.'' What does this mean?

A relation is ''cumulative'' when it is closed under *summing* of its arguments, indicated here by ''$+$.'' A one-place relation P is cumulative when (1) holds, and a two-place relation Θ, when (2) does (compare Krifka 1992).

(1) $P(e_1) \wedge P(e_2) \rightarrow P(e_1 + e_2)$

(2) $\Theta(e_1, x_1) \wedge \Theta(e_2, x_2) \rightarrow \Theta(e_1 + e_2, x_1 + x_2)$

Summing of x and y yields a single individual $x + y$ with x and y as its only improper *parts*. The improper part relation, $\sqsubseteq$, is reflexive, transitive, and antisymmetric. An individual with parts other than itself is *complex*. An individual that is not complex is *atomic*. Following David Lewis (1986:211), Kratzer takes summing to apply freely. Given any two individuals—say, Al Gore (a) and Marcus Junius Brutus (b)—there exists a unique complex individual that is their sum ($a + b$). Likewise for any two events. Al kissed his wife in 2000 AD (e_1), Brutus stabbed Caesar in 44 BC (e_2), and there is a complex event that is the sum of these two ($e_1 + e_2$). The parts of a sum needn't stand in any substantive relation.

Kratzer uses parts and sums in a semantic theory of sentences containing plurals, one deriving in large part from Link 1983. Complex individuals serve as the extensions of plural definites. And at least sometimes, summing interprets the conjunction of expressions in type $\langle e \rangle$, such that the extension of ''Al and Brutus'' is $a+b$. In addition, predicates of events have complex events in their domain. But unlike summing of entities, summing of events does not have very obvious morphological expression.[2]

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[1] Kratzer builds on this conclusion to make the further claim that, in general, an underlying direct object instantiates a lexical argument of the verb, rather than an argument of a covert predicate in its immediate context (Kratzer 1996). The latter alternative, she assumes, would be plausible only if the thematic relation imposed on the object were a very general one, compatible with many different types of events, as Theme is meant to be (contrast Schein 1993).

[2] Following Davidson 1967, sentences are existential quantifications over events, not directly referring descriptions or names. So conjunction of sentences does not straightforwardly express summing of events. Perhaps conjunction of event nominals expresses summing of events, but only if such nominals actually denote events (Parsons 1990), rather than entities uniquely correlated with events (Chierchia 1984).

Given this theory of plurals, cumulativity helps validate certain inferences.[3] Suppose, for example, that the (a) sentences in (3)–(5) have the logical forms in (b), and e_1 and e_2 are events that verify the first two sentences. Then cumulativity for the relations Agent and *dance* ensures that (3) and (4) jointly entail (5), since $\langle e_1 + e_2, a + b \rangle$ then satisfies Agent, and $e_1 + e_2$ satisfies *dance*.

(3) a. Al danced.
    b. $\exists e.\text{Agent}(e, a) \wedge dance(e)$

(4) a. Brutus danced.
    b. $\exists e.\text{Agent}(e, b) \wedge dance(e)$

(5) a. Al and Brutus danced.
    b. $\exists e.\text{Agent}(e, a + b) \wedge dance(e)$

In sentences with more than one plural argument, a logical form that expresses thematic relations in separate conjuncts becomes crucial (Krifka 1992, Schein 1993, Kratzer 2000). Suppose two editors separately proof a manuscript riddled with errors. There is an interpretation of (8a) under which it is implied by (6a) and (7a). Separate expression of the Agent relation allows the subject and object quantifiers in (8) to be independent. And now the inference from (6b) and (7b) is readily captured by presuming cumulativity, once again.

(6) a. Editor 1 found errors 1 through 12.
    b. $\exists e.\text{Agent}(e, x_1) \wedge find(e, y_1)$

(7) a. Editor 2 found errors 7 through 20.
    b. $\exists e.\text{Agent}(e, x_2) \wedge find(e, y_2)$

(8) a. Exactly two editors found exactly twenty errors.
    b. $\exists e.[\exists x : 2!(x)]\text{Agent}(e, x) \wedge [\exists z : 20!(z)]\,find(e, z)$

If e_1 and e_2 are events that verify (6b) and (7b), cumulativity ensures that $\langle e_1 + e_2, x_1 + x_2 \rangle$ satisfies Agent and $\langle e_1 + e_2, y_1 + y_2 \rangle$ satisfies *find*. (8b) must therefore be true, since by assumption $x_1 + x_2$ comprises two editors and $y_1 + y_2$, twenty mistakes.

To secure results like these, Kratzer pursues the conjecture that all event sortals and thematic relations are uniformly cumulative—at least if they are ''natural.'' The ''natural categories,'' she writes, are ''those that humans take to be candidates for denotations of simple lexical items, spontaneously and without any explicit instruction or definition'' (2003:7).[4]

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[3] Schein (1993) and Pietroski (2005) develop a theory of plurals as denoting, not complex individuals, but (second-order descriptions of) predicates. Under this theory, certain entailments otherwise guaranteed by stipulating cumulativity, such as those described in this section, instead follow as logical validities.

[4] The restriction to ''simple lexical items'' does not much weaken the definition, since Kratzer keeps the semantic contributions of syntactic relations to a minimum. Syntax introduces only application, conjunction, and perhaps something like composition of functions. All content beyond these operations, the substantive content, must come from the primitive items combined in syntax (i.e., the lexical items), and these may be silent. The natural predicates are therefore the initial candidate denotations for *every* minimal pairing of substantive content and syntactic form in the analysis of the sentence—with one exception. If a lexical item is not ''simple,'' it might not immediately find a denotation among the natural predicates. This is a wild card in Kratzer's hand, but here we can ignore it.

Kratzer says little about *why* the cumulative predicate meanings should be most immediately acquired: does this express an arbitrary bias of the language faculty, or something more general about the structure of thought and perception in human children?[5] Nor does Kratzer say whether the ontology of complex individuals that her discussion of cumulativity presumes is ''natural'' itself. Do toddlers come to presume, ''spontaneously and without explicit instruction,'' that any two objects are part of a complex individual, even when there is no substantive relation between them? Depending on the answers to these questions, the conjecture that ''natural relations'' are cumulative will be more or less plausible.

In any case, if the conclusions I reach below are correct, one strong version of Kratzer's hypothesis is falsified. We cannot maintain that thematic relations are cumulative, while also presuming that events can be summed freely.

3 Agent versus Theme

Kratzer argues that Theme is not cumulative, while Agent is. This conclusion is presented in the context of a broader intuition, (9).

> (9) ''Themes lack the conceptual independence of agents. Theme arguments seem to be tightly linked to their verbs. Agents are different. Actions seem to have agents independently of how we describe them.'' (Kratzer 2003:4)

So for Agent but not for Theme, one can tell whether x bears the relation to e, without knowing what other predicates hold of e.

There are well-known objections to this optimism about agents (see, e.g., Parsons 1990, Dowty 1991, Landman 2000, Schein 2002). Given an exchange of money for goods, for example, one cannot say who its agent was except relative to a description of the event as a buying or as a selling. So if there is a general Agent relation, and its domain is ''events,'' then these so-called events wear a description on their sleeve. They have structure that is not given just by what transpires in the world, fine enough to distinguish buyings from sellings. And (9) is therefore too strong.

That said, it's worth seeing how Kratzer develops the intuition.

Her perspective coincides with a further presumption. In testing for the cumulativity of thematic relations, she feels free to describe the sum event in any way that seems appropriate—since after all, the applicability of the tested predicate is not supposed to depend on how we describe the event of which it is predicated. In particular, the sum event need not be described using a verb that applies equally to its parts. Accordingly, Kratzer presupposes what I will call *Variety*, (10).

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[5] The latter possibility would seem to be more reasonable in this case. At the very least, it should not be that predicate meanings we acquire ''spontaneously'' lead immediately to thoughts and percepts that require ''explicit instruction.''

(10) *Variety*

An event e that satisfies description V may have an event e' that does not satisfy V as a proper part.[6]

Importantly, therefore, not all complex events are plain plurals in Kratzer's view, sums of several events that meet the same description. Some events are singular with respect to their description as a V, and yet nevertheless complex, in comprising a sum of possibly unlike parts.

For instance, Kratzer narrates the planting of a rosebush as in (11). Take e_1, e_2, and e_3 to be the events that verify these three sentences. More specifically, take these to be the sorts of finely structured events that support Agent relations. Then we can say that Agent relates Al to e_1, Bill to e_2, and Carl to e_3.

(11) a. Al dug a hole.
     b. Bill inserted a rosebush.
     c. Carl covered the hole with soil.

Now suppose that in virtue of what actually happened, we say (12), truly. Then there is also an event of planting a rosebush, e_4.

(12) Al, Bill, and Carl planted a rosebush.

But Kratzer says more. She proposes that the planting, e_4, is *identical* to the sum of the three other events, $e_1 + e_2 + e_3$. So the sum event is a single event of planting, according to Kratzer, but it has proper parts that are not plantings at all, thus illustrating Variety.

Were we to grant this equation, the proposed contrast between Agent and Theme would emerge. The agent of the planting, e_4, is supposed to be the sum of Al, Bill, and Carl. Hence, if e_4 is exactly $e_1 + e_2 + e_3$, the agents of the three parts sum to the agent of the whole. But consider the themes. What got planted was not the hole, the rosebush, and the soil together—it was just the bush itself. So the themes of the parts do not sum to the theme of the whole. We can derive this result by assuming that Agent is cumulative but Theme is not. Then (11), plus the assumption that $e_1 + e_2 + e_3$ is a planting, entails (13) but not (14).

(13) Al, Bill, and Carl planted something.

(14) Al, Bill, and Carl planted a hole, the rosebush, and soil.

Yet the equation is hard to accept. What goes on in the world according to (11) makes (12) true, by assumption. But the Agent relation is not a relation directly to what goes on in the world. It cannot be; not when it distinguishes buyings from sellings. The ''events'' entering into Agent relations have structure not given solely by the stretches of history to which they correspond, many-to-one. And it is not obvious that a mere sum of such events—each of which may satisfy a different description and thus have its own characteristic structure—will itself have the structure needed to support a thematic relation. The planting is somehow related to the three events of

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[6] That is, V(e), and for some e' distinct from e, $\exists x[e' + x = e]$, but $\neg$V(e').

digging, inserting, and covering. But are the properties in virtue of which we recognize its agent and patient present just in their sum? I would say they are not, any more than the properties that give the Eiffel Tower an apex are present in the mere set of its parts. But Kratzer's discussion implies that they are.

One might cede this objection, but blame the rosebush example. Perhaps there are clearer cases of part-whole relations among events, and these will better support Kratzer's position. Below I will discuss what may be the best candidates, namely, the events of causatives and resultatives. And we'll see that, still, the cumulativity of Agent cannot be upheld.

Before then, it is important to notice that the asymmetry vanishes whenever the summed events do not exhibit Variety, and thus when the sum event is just a plural. Themes then add up just as well as agents do. Suppose for example that the events that verify (15a) and (15b) sum to an event that verifies (16).

(15) a. Al wrote a poem.
      b. Bill drew a picture.

(16) Al and Bill created a poem and a picture.

Here the same description, *create*, also applies to the writing and the drawing, the parts of the putative sum event. This sum is just a complex event of creation, built from two smaller ones. So we don't see Variety. And correspondingly, both participants add up. The agent of the complex event is the sum of Al and Bill, while its theme is the sum of the poem and the picture.

To be clear, let us therefore distinguish two ''kinds'' of cumulativity, one that does not depend on the description provided by the verb, and one that does.

(17) *Independent Cumulativity*
      Cumulative, under any description of the sum event.

(18) *Dependent Cumulativity*
      Cumulative, at least under a description of the sum event that also applies to its parts.

Importantly, the second type of cumulativity is enough to license the inferences in (3)–(8). Arguably, therefore, Kratzer's theory of plurals needs no more than this. But the proposal to exclude Theme from the family of natural relations relies on the first, and stronger, kind of cumulativity; it assumes that Agent has this property but Theme does not. Yet we'll see more reason to believe that Agent doesn't have it either.

4 Thematic Uniqueness and Devolution

Sentence (19) does not say merely that there was a lifting whose agent (or agents) included Al, and whose theme (or themes) included the piano. If it did, (20) would be enough to make it true. But in fact (20) does not entail (19), since (20) allows that Al did nothing at all to the piano.

(19) Al lifted the piano.

(20) Al and Bill lifted the piano and the harpsichord.

Rather, (19) makes the stronger statement that there was a lifting whose only agent was Al, and whose only theme was the piano. For this reason, it entails that Al lifted the piano (Schein 1993).

Semantic theories need to ensure this result. Those that presume an ontology of complex individuals, like Kratzer's, do this with a principle like (21); see Carlson 1984, Dowty 1989, Parsons 1990, Landman 2000, Kratzer 2001.[7]

(21) *Thematic Uniqueness*
For any thematic relation Θ and event e (possibly complex), there is at most one individual d (possibly complex) such that $\Theta(e, d)$.

So if (19) implies an Agent relation between Al and a lifting, there can be no other individual so related.

Thematic Uniqueness requires even finer structure in the events to which sentences assign thematic relations, more than the verb does alone (Lasersohn 1995, Schein 2002). Suppose that Al was sickened by an egg, because he was sickened by its albumen. Then (21) demands two distinct sickenings, since the egg is not its albumen. And insofar as this and similar consequences are accepted, the equations that underlie Kratzer's contrast between Agents and Themes become even less tenable. If getting sick from the albumen is not getting sick from the egg, how could it be that the planting is merely the sum of the digging, inserting, and covering?

The final challenge to Kratzer's conjecture, to be developed in the remainder of this article, depends on an interaction of Thematic Uniqueness with Cumulativity, (22). Thematic relations to e devolve to e's parts (Kratzer 2001:29).

(22) *Devolution*
If Θ is (independently) cumulative and $\Theta(e, d)$, then for any part e' of e, if there is a d' such that $\Theta(e', d')$, then d' is either identical to, or part of, d itself.

For if e' is a part of e ($e' \sqsubseteq e$), their sum is just e again ($e' + e = e$). The sum of their agents is $d' + d$. But by assumption, the complete agent of e is just d. So it must be that $d' + d = d$, hence that $d' \sqsubseteq d$. In case the agent d of event e is an *atomic* individual, therefore, d must also be the agent of any part e' that has an agent.

Kratzer (2003:4) immediately notices a problem in causatives like (23). This sentence seems to describe an event of making Bill vote, one that has a voting as a part and whose agent is just Al alone. But then the agent of voting too would have to be Al, and this is wrong.

(23) Al made Bill vote for George.

To defuse the challenge, Kratzer revises our interpretation for (23). Al is not the agent of a making-vote. Rather, he is the agent of some event that itself is in a Cause (or *make'*) relation to Bill's voting, but does not have the voting as a part.

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[7] See Schein 1993, 2002, and Pietroski 2005 for theories that deal with thematic relations but do not presume that plurals denote complex individuals. Instead of (21), these theories presume that a plural argument in a position assigned a Θ relation to a predicate P is constrained to identify all and only the Θ participants in the events $e_1, \ldots, e_n$ that satisfy P.

This suggests, however, that event-oriented adverbs in the main clause should describe the action that causes Bill's voting for George. Suppose this was in fact the action of (24). Then it was passionate, on the rostrum, and ten seconds long. And yet we cannot assert these same facts by saying (25), all of whose interpretations assert something quite different. Thus, the revised semantics cannot be right, and the challenge to Kratzer's position remains sharp.[8]

(24) Al passionately kissed his wife for ten seconds on the rostrum.

(25) Al passionately made Bill vote for George for ten seconds on the rostrum.

I now introduce a related challenge, from resultatives like English (26) and Mandarin (27). What is interesting here is that the facts of English finally seem to provide Kratzer's conjecture with resounding support—and yet Mandarin contradicts it directly. The apparently supportive data from English can therefore be a consequence neither of Cumulativity nor of any other semantic principle presumed to be universal.

(26) Al pounded the cutlet flat.
    'Al made the cutlet flat from pounding.'

(27) Tā tī duàn -le nàtiáo mùbǎn.
    3SG kick snap -PFV that wood.plank
    'She/He made the plank snap from kicking.'[9]
    (More naturally: 'She/He kicked the plank in two.')

5 Resultatives and Thematic Relations

A resultative is a single clause comprising two overt predicates, the *means* predicate M and the *result* predicate R, neither one introduced by a conjunction or adposition. The clause describes a change, concluding in a state defined by R and achieved by means of an event described by M. In (26), M is the verb *pound* and R is the phrase *flat*. In Mandarin (27), both are verbs: *tī* 'kick' and *duàn* 'snap', respectively.

Importantly, an adverb that modifies the verb phrase as a whole does not ipso facto modify M. (28) does not entail (29), for example, under either placement of the adverb; as a consequence, (30) is in no way odd or contradictory. Likewise, (31) does not entail the absurd proposition that Ozzy *sang* by not resting.

(28) Al (slowly) pounded the cutlet flat (slowly).

(29) Al (slowly) pounded the cutlet (slowly).

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[8] Compare the similar discussion of lexical causatives in Pietroski 2005:185–189.
[9] To avert certain confusions, I impose a uniform scheme of translation: 'Subject made Object Verb-2 from Verb-1'ing'. The resulting formula is meant to convey only the general content of the sentence, not its grammatical structure. The Mandarin construction involves no verb meaning 'make', the two verbs are not separately inflected, and the first verb is not contained within an adjunct prepositional phrase. Interlinear glosses use these abbreviations: 1/2/3SG 'first/second/third person singular pronoun', COP 'copula', NEG.POT 'negative potential infix', NMOD 'adnominal modifier', PFV 'perfective', SELF 'reflexive pronoun'.

(30) Striking it rapidly for hours, Al slowly pounded the cutlet flat.

(31) Ozzy sang his throat hoarse by not resting between songs.

It follows that the verb phrase is a predicate of an event e_1, distinct from the event e_2 of M. Abstracting from many details, the verb phrase in (26) has a meaning something like (32), for some relation K. Presumably $K(e_1, e_2, e_3)$ requires at least that e_1 is a change that concludes with e_3 and is achieved by means of e_2.

(32) $[\![$ *pound the cutlet flat* $]\!]$
   $= \ldots \lambda e_1 \exists e_2 \exists e_3 . K(e_1, e_2, e_3) \wedge pound(e_2, \ldots) \wedge flat(e_3, \ldots) \ldots$

Correspondingly, the semantics for resultatives in Kratzer 2005 cannot be right. It treats *pound the cutlet flat* as a predicate true of poundings with a certain relation Φ to a state of flatness, (33). And in that case, (28) should entail (29), wrongly.[10]

(33) *$[\![$ *pound the cutlet flat* $]\!]$
   $= \ldots \lambda e_2 \exists e_3 . \Phi(e_2, e_3) \wedge pound(e_2, \ldots) \wedge flat(e_3, \ldots) \ldots$

Now, Variety allows that a singular event can have unlike parts, parts that don't satisfy the same description as the whole. From that perspective, it would also seem right to say that a single pounding flat has a pounding as a part, and necessarily so. Certainly it is safer than saying that a planting has a digging as a part, since every pounding flat involves a pounding, but not every planting involves a digging. Thus, for those who join Kratzer in presuming Variety, resultatives are an ideal domain in which to test for cumulativity.

Suppose then (at the moment, just for the sake of argument) that (26) says Al is the agent of the pounding flat, event e_1 in (32) (compare McCawley 1971, Green 1972). Given that poundings too have agents, Al must then be the agent of the pounding as well, e_2 in (32), by Devolution.

And indeed he is: (26) entails that Al pounded the cutlet. Moreover, this reflects a categorical property of the English resultative. Without exception, the underlying subject names the agent of the means event.[11] And for just this reason, the English resultative can be seen as showcase evidence for Kratzer's suite of assumptions. If any construction describes a complex event with an unlike part, it is the resultative, whose event of change plausibly has the event of M as a proper part. And sure enough, as Independent Cumulativity and Thematic Uniqueness jointly require, the agent of one must be the agent of the other—in English.

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[10] Kratzer's name for Φ is ''CAUSE.'' Simplifying, CAUSE(e, e') says that e is a change that results in e'. Kratzer refers to such an e as an ''event of causing.'' To one reviewer, this suggested that if e is both an event of causing and (e.g.) a pounding, then the agent of pounding is also the ''agent of an event of causing.'' This does not follow; or it ought not follow, unless we want to say that the agent of a pounding that precedes sunset is therefore the agent of an event of preceding sunset. It would follow only if events of causing *as such* have agents. Were Kratzer to assume that they do—and thus, given (32), that the agent of the means event is necessarily the agent of the event of causing—then the discussion of Mandarin below would count as further evidence against the semantics in (32).

[11] The surface subject is the underlying subject, I presume, only when it does *not* identify the theme of the result state described by R (Simpson 1983, Levin and Rappaport Hovav 1995, Williams 2007). So in *The lake froze solid*, for example, *the lake* is not a subject underlyingly.

But this cannot be an expression of semantic universals, since things are different in Mandarin. Sometimes, as in (27), Mandarin looks like English: the underlying subject is naturally understood as referring to the agent of the means event, the one named by the first verb. But not always (Lü 1986, Ma 1987, Li 1990, Gu 1992, Huang 1992, Ren 2001, Williams 2005). In other cases, the subject is most naturally taken to refer to the theme of the means event, (34), or to an individual with no thematic relation to that event at all, (35).[12]

(34) a. Yīfú xǐ lèi -le jiějiě.
clothes wash tired -PFV elder.sister
'The clothes made Big Sister tired from [her] washing [them].'
(Ren 2001:326; my translation)

b. Nà píng jiǔ hē zuì -le wǒ.
that bottle wine drink drunk -PFV 1SG
'That bottle of wine made me drunk from drinking.'
(Gu 1992:80; my translation)

(35) a. Zhèjiàn shì kū hóng le Lǐsì-de yǎnjīng.
this matter weep red PFV Lisi's eyes
'This matter made Lisi's eyes red from weeping.'
(Huang 1988:296; my translation)

b. Chī jǐ dùn miàntiáo yě chī bu qióng tā.
eat several meal noodle also eat NEG.POT poor 3SG
'Eating a few meals of noodles won't make him poor from eating.'
(Lü 1986:7, quoting Jiang Zilong, *Weichi Huizhang*; my translation)

The latter type of example is important. It shows what the defender of Independent Cumulativity would want to deny—and what we assumed provisionally for English (26). The subject is indeed assigned a thematic relation to the event of change associated with the whole verb phrase, independent of any additional relation to the events of M or R. In particular, it is necessarily construed as referring to the initiator of that event, its agent (see Li 1990, Gu 1992, Huang 1992, Williams 2007). And yet this thematic relation does not devolve to the means event, as Independent Cumulativity requires. (35b), for example, talks about an event of change, one that ends in poverty and is brought about by eating. The initiator or agent of this change is an eating of noodles. But this eating of noodles didn't eat anything. It is not the agent of the event described by the verb in M. That event, an eating, has a different agent, presumed to be the person indicated by the pronoun in object position.[13]

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[12] Not all relations to an event that satisfies the description of a verb V are *thematic* relations. I count only those that are imposed on the interpretation of some argument in a simple clause whose predicate is V. So if Al made Bob cry, Al has some relation to the crying—he made it happen—but not a thematic relation, since this sort of relation to a crying is imposed on neither argument in the sentence *He cried tears*.

[13] Elsewhere (Williams 2005, 2007), I have argued that the semantics of resultatives always involves, not only an Agent for the event of change, but a Theme as well. This relation is assigned to the underlying object and implies undergoing the change to the R condition. It is readily seen that this relation does not devolve from the event of change to the means event either: witness *Ozzy shouted his throat hoarse*.

Since the Agent relation need not devolve to the putative parts of its event, it is not independently cumulative. The English resultative obscures this, because it exhibits a requirement that is absent in Mandarin: the verb in M must find its agent in the underlying subject of the clause, just as it would in general. This difference between the two languages is remarkable; for an account of it, see Williams 2008 (and contrast Li 1990). All that matters here, however, is its consequences. It allows for Mandarin to demonstrate linguistically that there is no principle that requires the agent of a change to be the agent of its means event.

Of course, the challenge from Mandarin would dissolve if I were wrong, and the event structure of its resultative were different from what I have assumed, (36).

(36) $\exists e_1 \exists e_2 \exists e_3.K(e_1, e_2, e_3) \wedge [\![M]\!](\ldots)(e_2) \wedge [\![R]\!](\ldots)(e_3) \wedge \text{Agent}(e_1, [\![\text{Subject}]\!]) \ldots$

In particular, suppose it instead had a *causing-event semantics*, (37), similar to what Kratzer assigns to English periphrastic causatives like (23). Then the Mandarin resultative would say just that one event e_c causes another e_r, where the latter is the event of R (or maybe a change that ends with it); and the reason we regard the referent of the subject as a ''causer'' would not be that it has an Agent relation to a superordinate event of change, but only that it has *some* relation Θ to the causing event, e_c.[14]

(37) $\exists e_c \exists e_r.\text{Cause}(e_c, e_r) \wedge [\![R]\!](e_r) \wedge \Theta(e_c, [\![\text{Subject}]\!]) \ldots$

In sentences like those in (27) and (34), we would understand this e_c to be the very event described by the verb in M, e_m; for example, if (34a) says that some event e_c involving the clothes caused Big Sister's exhaustion, then surely e_c was an event of washing them. But cases like those in (35) are different. Here e_c and e_m would have to be distinct, since the subject doesn't refer to any participant in the latter. (35a) says that a certain matter made Lisi's eyes red, but not that it wept or got wept. These cases would demand a semantics like (38).

(38) $\exists e_c \exists e_m \exists e_r.\text{Cause}(e_c, e_r) \wedge [\![R]\!](e_r) \wedge \Theta(e_c, [\![\text{Subject}]\!])$
     $\wedge \Psi(e_m, e_r) \wedge [\![M]\!](\ldots)(e_m) \ldots$

Then (35a) would say that a certain matter participated in an event e_c, that e_c caused redness in Lisi's eyes, and that the redness had some relation Ψ to a weeping. Informally, the matter made Lisi's eyes red from weeping.

The details may be different. But whatever they are, under this alternative semantics, the subject is not the agent of a change with the M event as a proper part. And consequently there is no question of whether the part has the same agent as the whole, as cumulativity requires.

However, there are at least two reasons to reject this revision. The first comes, again, from adverbs. If the subject identifies a participant in the causing event, then the maximal verb phrase

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[14] In some theories of causatives (e.g., Parsons 1990), the subject may either name a participant in the causing event or instead provide a description of that event. I find this ambiguity unattractive and unnecessary. But in principle it is possible here as well; one could suppose, for instance, that the subject of (35b) describes e_c directly, as an event of eating several meals of noodles.

is presumably a predicate of that event (either that or a function from an individual to such a predicate). Consequently, it should be this very causing event that is the target of a verb phrase modifier. But (39) shows otherwise. Here the causing event is understood to be one of the wind blowing.[15] And yet an adverb that would describe such an event, (40), though not one of making somebody ill, is impossible.

(39) Lěng fēng (*hūhū-de) chuī bìng -le tā.
cold wind howlingly blow ill -PFV 3SG
'A cold wind made him/her ill from blowing howlingly.'
(Li 1980:100; my translation)

(40) Lěng fēng hūhū-de chuī.
cold wind howlingly blow
'A cold wind blew howlingly.'
(Li 1980:100; my translation)

The same point can be made even with resultatives like those in (34) or (35), where the subject does not name the agent of the M event. The adverb is impossible in (41), and in (42) it describes the change, not the washing. This argues against the causing-event semantics, and in favor of what I assume: the maximal verb phrase is predicated of a change, distinct from the event of M.

(41) Nà píng jiǔ (*gūlu-gūlu-de) hē zuì -le wǒ.
that bottle wine 'glug-glug-ingly' drink drunk -PFV 1SG
'That bottle of wine made me drunk from [my] drinking [it] gluggingly.'

(42) Yīfú jiànjiàn-de xǐ lèi -le jiějiě.
clothes gradually wash tired -PFV elder.sister
'The clothes gradually made Big Sister tired from [her] washing.'

Second, under the causing-event semantics, it can make no difference to the truth conditions *which* participant is identified by the subject. If my singing a song causes hoarseness in my throat, for instance, then it does so whether the subject of a sentence I use to say this refers to me or the song. Yet speakers share the intuition that (43) does not entail (44), even when what is sung is held constant.

(43) Wǒ chāng yǎ -le sǎngzi.
1SG sing hoarse -PFV throat
'I made [my] throat hoarse from singing.'

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[15] It might be that the semantics of (39) states explicitly that the causing event, e_1, is a blowing. Or perhaps it does not, and we instead infer this pragmatically, given a denotation which says that e_1 caused an event of be(com)ing sick from a blowing. But either way, insofar as e_1 is understood to be a blowing, it should be possible to describe it as howling.

(44) Nàshou gēqu chāng yǎ   -le   wǒ.
     that   song sing hoarse -PFV 1SG
     'That song made me hoarse from singing.'

(44) says something that (43) does not, namely, that the song is itself responsible for the injury. Imagine that the song is simple, and I hurt my throat just by singing its first lines too aggressively. Then (43) is quickly judged true, but (44) is not. Instead, one can raise the objection in (45).

(45) Bu shì nǐ chāng -de   gē   chāng yǎ   -le   nǐ-de sǎngzi! Shì nǐ zìjǐ!
     NEG COP 2SG sing -NMOD song sing   hoarse -PFV your throat COP 2SG SELF
     'It's not the song you sang that sang your throat hoarse! It's you yourself!'

Here the causing-event semantics has nothing to say. But the facts are as expected if the subject identifies the agent of an event of change, besides any understood relation it may have to the means event. If I am the agent of my throat getting hoarse from singing, then the song I sang is not. So the event structure of the Mandarin resultative must be as I have supposed.

Given this, only one reply remains available. To maintain Kratzer's objection, one must assume that the thematic relation assigned to the subject in a resultative, relative to the event of change, is not the general Agent relation. It is some other, more particular relation; let's call it *Causer*. Then, even if this new relation is cumulative, it devolves to the subevents only if those subevents themselves have causers. For example, the causer of an event of drinking someone drunk—see (34b)—is the causer of its component drinking only if drinkings have causers. And why not say that they don't? Often enough, the verbs that occupy resultatives are activity verbs, not causatives, and presumably activities don't have causers.

There is no need to fuss over cases where the verb describing the means of change may itself be causative, as when it means 'cut', for the suggested resolution of the challenge is weak enough as it is. If Agent is to be a natural and basic predicate, I would expect that it applies at least to both activities and events of caused change. More importantly, to say instead that the actor in an activity and the initiator in a change do not share a thematic relation makes Kratzer's theory much weaker.

In particular, it vitiates the project of summing subjects. Al and Bill can participate in the cleaning up of a tabletop, Al by clearing it of plates and Bill by wiping it.

(46) a. Al clears the tabletop of plates.
     b. Bill wipes the tabletop.
     c. Al and Bill clean up the table.

The clearing and the cleaning are both changes, and changes are supposed to have causers. Given that the clearing is part of the cleaning up, Independent Cumulativity therefore tells us that Al is among the cleaners. But not so Bill, even when the wiping is part of the cleaning up too. Wiping is an activity, and activities have agents, not causers, by hypothesis.

And yet, cumulativity *would* tell us that Bill is among the cleaners if he had not merely wiped the tabletop, but dried it off. For then Bill, as the drier, would be a causer, since drying off is a change.

(46) b.′ Bill dries off the tabletop.

This asymmetry seems strange. If there are general semantic principles that force us to put Bill among the cleaners given (46b′), they should do the same given (46b), it seems to me. So while dividing subjects into causers and agents saves Independent Cumulativity from the resultative data, it lessens the descriptive coverage of that doctrine. And the result is an unintuitive loss of generality.

Thus, resultatives have the same event structure in Mandarin as in English.[16] The difference is just that Mandarin does not grammatically require the subject to refer to the agent of the means event, even when it refers to the agent of change. As a result, Mandarin shows that Agent is not independently cumulative.

6 Conclusion

Kratzer (2003) argues that Agent is independently cumulative—cumulative under any description of the event—while Theme is not. This hypothesis finds its best test in resultatives. And here Mandarin makes clear what the grammar of English obscures: Agent is not independently cumulative either. So if there is to be a deep distinction between the two thematic relations, a distinction that makes only one of them ''natural,'' it is not to be found in cumulativity. More fundamentally, it is doubtful that Independent Cumulativity even could be true. It rests on Variety, the premise that a single event may be identical to a sum of other events of unlike sorts. And individuals, whether objects or events, are not in general identical to the mere sum of their putative parts.[17]

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[16] Of course, the syntax of resultatives is not the same in the two languages. In Mandarin, the predicate comprising both M and R is a complex verb, while in English, it is phrasal and discontinuous. But this should not matter to the semantics of the Agent relation, which Kratzer claims is cumulative. Moreover, it would be a very different claim to say that Agent is cumulative only for events that happen to be described by a verb in a certain syntactic context—in particular, a verb that is not contained within a larger, complex verb.

[17] Oddly, while Kratzer clearly presupposes Variety in distinguishing Theme from Agent in Kratzer 2003, she appears to reject it in Kratzer 2001:25: ''[W]henever *e* is a reading, eating, building, pushing, or petting of something, and *e*′ is a subaction of *e*, then *e*′ is a reading, eating, building, pushing, or petting of something as well.''

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