

Agents in Mandarin and Igbo Resultatives

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1 Introduction

Huang 1988 and 1992 are landmarks in the cross-linguistic analysis of complex predicates. The rigor and creativity of these studies made way for two fertile decades of further work in the area, on a wide array of languages. Together with their sequels, these papers have contributed inestimably to our understanding of verbs and the structure of predicates, drawing on the lessons of Chinese languages.

My topic is clauses with resultative complex predicates in Mandarin, Igbo and English. This paper concerns only those with an agentive verb, such as English (1) and (2).

- (1) Lee cut the bone open.
- (2) Mo sang her throat hoarse.

I call *cut* and *sing* agentive both because cuttings and singings necessarily have agents, and because (3) and (4) are bad. These are transitive and unergative verbs.

- (3) * The bone cut.
'The bone got cut.'
- (4) * The intro sang.
'The intro got sung.'

In English, resultatives with such verbs have two features I want to discuss in a cross-linguistic context. First, when they inhabit a transitive clause, as in (1) and (2), the subject must name the agent of the verb's event.¹ (1) entails that Lee cut something and (2), that Mo sang. (5) and (6) are accordingly impossible. I explain the unusual glosses below in section 2.

- (5) * The bone cut his knives dull.
'The bone made his knives dull from cutting [it].'
- (6) * The intro sang her throat hoarse.
'The intro made her throat hoarse from singing [it].'

In this respect the resultative clauses are just like those with the agentive verb on its own. In (7) and (8) as well, the subject must name the cutter or singer.

- (7) Lee cut the bone.
 (8) Mo sang (the intro).

Second, such resultatives cannot occur in unaccusative clauses, such as (9) or (10), without any dependent to name the agent implied by the verb. Again this is like the verb on its own: (9) and (10) match (3) and (4), respectively.

- (9) *The bone cut open.
 ‘The bone got open from [someone] cutting [it].’
 (10) *Mo’s throat sang hoarse.
 ‘Mo’s throat got hoarse from [someone] singing.’

These two features have had a decisive influence on theories of the resultative, and on general theories of argument structure, through works such as Dowty 1979, Levin and Rappaport Hovav 1995, and Kratzer 2005. In many theories, at least one of the two is grammatically or conceptually necessary. Yet this cannot be right, as they are not exhibited equally in every language. Neither feature is exhibited in Mandarin. First, the transitive clause in (11) does not entail that the bone did any cutting.²

- (11) Na gen gutou qie dun -le wode caidao.
 that CLS bone cut dull -PFV my food knife
 ‘That bone made my knife dull from cutting.’

Second, the intransitive clause in (12) contains *tui* ‘push,’ which on its own occurs just in clauses with a subject naming the pusher.

- (12) Na liang che tui fan -le.
 which CLS car push reverse -PFV
 ‘Which car got upended from pushing [it]?’ (adapted from Tan 1991:79)

Igbo does share the first feature with English, so that (13) entails that Chidi dug out something, and (14) is accordingly impossible.

- (13) Chidi gwu ji -ri oḡu ya.
 C. dig out snap -FACT hoe 3s
 ‘Chidi made his hoe snap from digging out [stuff with it].’
 (14) *Ji ahụ gwu ji -ri oḡu ya.
 yam that dig out snap -FACT hoe 3s
 ‘That yam made his hoe snap from digging out [with it].’

But like Mandarin, Igbo differs from English in allowing for sentences like (15), the unaccusative counterpart to (13), even though *gwu* ‘dig out’ alone is a transitive verb (Nwachukwu 1987, Uwalaka 1988, Hale et al. 1995).

- (15) Ọgụ ya gwu ji -ri egwuji.
hoe 3s dig out snap -FACT BVC
'His hoe snapped from digging out [stuff].'

The likeness on display in (12) and (15) is not, however, complete. In unaccusative clauses with resultative complex predicates, Igbo allows only a subset of the agentive verbs that are possible in Mandarin. For example, (16) replaces *gwu* 'dig out' in (15) with *zọ* 'tread on,' and the result is unacceptable (Hale et al. 1995). This contrasts with Mandarin (17).

- (16) *Ọgụ ya zọ ji -ri egwuji.
hoe 3s tread on snap -FACT BVC
'His hoe snapped from treading on [it].'
- (17) Haojige pingguo cai lan -le.
many apples tread mushy -PFV
'A good many apples got mushy from treading [on them].'

So along our dimensions of interest, we have minimal comparisons between these three languages. The contrast between Mandarin and Igbo is especially interesting, since their resultatives are otherwise quite similar (Lord 1975, Williams 2008).

In this paper I ask how to describe these facts theoretically, in light of the variation between languages. First, what is the grammar of Mandarin and Igbo such that (12), (15) and (17) are acceptable when Mandarin *tui* 'push' and *cai* 'tread on,' or Igbo *gwu* 'dig out,' are on their own transitive verbs, and when the same is not possible in English, or for Igbo *zọ* 'tread on' in (16)? Second, what requires the subject in Igbo (13) to name the agent of the digging, as in English (5), when this is not necessary in Mandarin (11)? Our answers should keep the grammar of each language simple. But they should also trace the variance among languages to plausible points of difference, keeping as much as possible constant. And this is not as easy as it looks, despite how banal the facts of English might appear. In my view, the basic case is laid bare for us by Mandarin. The patterns of English or Igbo are elaborations within the outlines that Mandarin makes plain, expressing additions either to the argument structure of verbs, or to the structure or meaning of the resultative. So the question is, which way of elaborating makes the most sense?

To focus, I will proceed in the context of a theory I have defended elsewhere (Williams 2008, 2009, 2014, accepted). In earlier expositions, I responded mainly to the interpretation of the underlying object in a resultative clause. I now attend to the underlying subject. The theory serves to illuminate the particular challenges of the data I have in my sights. But those challenges remain sharp even under accounts of the resultative other than my own, such as those in Li 1995, Levin and Rappaport 1995, Rappaport Hovav and Levin 2001, Rothstein 2004, Kratzer 2005, or Huang et al. 2009, though I will not pause to show this. My goal is not to prove my framework right, but at most to show how our data might be described in its terms. One part

of this framework is the claim that verbs in Mandarin and Igbo characteristically do not have any arguments, while verbs in English do (Williams 2005, 2008). In this setting we have the question whether facts like Igbo (14) and (16), or English (5) and (9), require that agentive verbs in these two languages have their implied agent as a lexical argument, an assumption with little motive in Mandarin. For both Igbo and English, my answer will be a very cautious No.

The paper unfolds as follows. Section 2 establishes some basic facts about resultatives, as well as the terms I use to describe them. Section 3 reprises the theoretical frame for our discussion, and applies it to the interpretation of objects. I then turn to our two main questions. Section 4 asks how to describe cases like Mandarin (12) and (17), or Igbo (15) and (16), where a resultative with an agentive verb can or cannot inhabit an unaccusative clause. Section 5 concerns such predicates in transitive clauses, such as Mandarin (11), or Igbo (13) and (14). How should we ensure that, in Igbo and English but not Mandarin, the subject then names the agent implied by the verb? I summarize in section 6.

2 Basics of resultatives

A resultative complex predicate has two parts, a *means predicate* M, and a *result predicate* R. In Mandarin (17) above and (18) just below, M contains at least *cai* ‘tread on’ and R, at least *lan* ‘mushy.’ In Igbo (19) and (20), M and R contain at least *ku* ‘strike’ and *wa* ‘split.’

- (18) Ta cai lan -le haojige pingguo.
 3s tread mushy -PFV many apple
 ‘S/he made a good many apples mushy from treading [on them].’
- (19) Q ku wa -ra ọba ahụ.
 3sS strike split -FACT gourd that
 ‘He made that gourd split from striking.’ (Hale et al. 1995)
- (20) Ọba ahụ ku wa -ra akụwa.
 gourd that strike split -FACT BVC
 ‘That gourd split from striking.’ (Hale et al. 1995)

I take M to be the largest expression containing the predicate head which does not also contain R, or any structure that introduces any part of the meaning associated with the construction. Likewise for R, *mutatis mutandis*. The smallest constituent containing both M and R, I will call MR.

In surface syntax, resultatives are very similar in Mandarin and Igbo. Both M and R in general house a root that can occur on its own as a verb that exhausts the clausal predicate, as *ku* ‘strike’ and *wa* ‘split’ do in Igbo (21) and (22). In addition, the verbs in M and R are never audibly separated by an adjunct or argument, and suffixes attach to MR as a whole.

- (21) Ọ kụ -rụ ọba ahụ.
3sS strike -FACT gourd that
'He struck that gourd.'
- (22) Ọba ahụ wa -ra awa.
gourd that split -FACT BVC
'That gourd split.'

English is different in at least four ways. M and R are separated by the direct object, affixes attach to the verb in M, R may contain adverbial modifiers, and the head of R cannot be a verb or even a deverbal participle.

No audible morphemes signal the meaning of the construction. But a resultative clause entails that there was a change or process that ended with the event of R and was achieved by means of the event described by M. Thus Igbo (19) and (20) entail that there was a change or process that ends with a snap and is achieved with a strike. In general this entails that the M event caused that of R. But there is much more to the semantics than merely causation.³

I will assume that any resultative complex predicate, MR, has a meaning with the outlines of (23). Here \mathcal{K} is true of $\langle e_1, e_2, e_3 \rangle$ just in case e_1 is a process ending with e_3 and achieved by means of e_2 . Thus \mathcal{K} can be analyzed as the conjunction of two other relations, say as in (24), but that won't matter in this paper.

- (23) $\llbracket \text{MR} \rrbracket = \lambda e_1 \exists e_2 \exists e_3 [\dots \mathcal{K}(e_1, e_2, e_3) \ \& \ \llbracket \text{M} \rrbracket(\dots)(e_2) \ \& \ \llbracket \text{R} \rrbracket(\dots)(e_3) \dots]$
- (24) $\mathcal{K}(e_1, e_2, e_3) \equiv \text{Means}(e_1, e_2) \ \& \ \text{End}(e_1, e_3)$

What will matter greatly is the assumption in (25): an event that satisfies MR need not satisfy M. This implies, contra Parsons 1990, Kratzer 2005, and many others, that the event of MR (e_1) is not identical to that of M (e_2), as allowed by (23).

- (25) Third Event Assumption (TEA)
An event that satisfies MR need not satisfy M, and therefore the two are predicates of different events.

Adverbs provide one reason for this: an adverb modifying MR need not describe the M event (Rappaport Hovav and Levin 2001). For example, (26a) does not entail (26b). Given that adverbs like *slowly* are predicates of events (Davidson 1967), this would not be possible if satisfiers of MR were always to also satisfy M, much less if the two were predicates of the very same event.⁴

- (26) a. Al slowly pounded the cutlet flat.
b. \nexists Al slowly pounded the cutlet.

In (26a), *slowly* describes the process of flattening the cutlet, the event of MR, e_1 in (23). And in fact it cannot describe the pounding that was done in its service. If it could, we could use (27) to say that the cutlet was slowly flattened by means of quick pounding. But we can't, suggesting that M is inaccessible to direct modification.⁵

- (27) * Al quickly pounded the cutlet flat slowly.
 ‘Al slowly made the cutlet flat by pounding it quickly.’

Analogous facts hold of Mandarin. An adverb such as *jianjian-de* ‘gradually’ may describe the MR process without describing its means event, and direct modification of M is arguably impossible, as suggested by (28).

- (28) Leng feng (#huhu-de) chui bing -le ta.
 cold wind howlingly blow ill -PFV 3s
 ‘A cold wind made him/her ill by blowing (howlingly)’
 (L. Li 1980:100, translation AW)

I will assume the same for Igbo, and this will be essential for everything to follow in this paper. Theorists who have not recognized the TEA have also not noticed the challenges we face in this paper. Without the TEA, many would not arise.

Now turn to the interpretation of the surface subject and object, S and O. These may name participants in the event of M. Interpreting a use of (19), we may take it to concern a striking in which S names the striker, and O names the struck. In addition, a resultative entails that some individual changes, entering a result condition defined by R. The overt phrase that identifies this individual *controls* R. In Mandarin (18) and Igbo (19), it is O controls R, since the apples wind up mushy and the gourd winds up split. In (17) and (20), however, it is S that controls R. I will refer to resultative clauses in which O controls R as *transitive* and those in which S controls R as *intransitive*. This should not be mixed up with the distributional category, intransitive or transitive, of the verb in M.

My glosses will follow a fixed format, exemplified above in the data already given. Transitives are glossed as “S made O R from M’ing,” and intransitives as either “S got R from M’ing” or “S R’ed from M’ing.” When relevant, I will add an understood subject or object for “M’ing,” within square brackets. In the use of *from* with transitives, the result is rarely idiomatic. But the uniformity will avert two unwarranted suggestions. First, that transitive and intransitive resultatives differ in the semantic relation between the events of M and R; second, that S in a transitive must name the agent of its means event, which is not the case in Mandarin, witness (11).

3 A theory of resultatives

3.1 Outside Relations Semantics

In Williams (accepted) I argue that, across languages, resultatives are best analyzed as having an *Outside Relations* (OR) semantics. This says that, in the meaning of a resultative clause, S and O bind thematic relations to the event of MR, besides any relations there might be to the event of M. A transitive has a meaning like (29a), and an intransitive has a meaning like (29b).

- (29) a. $\lambda e[\text{Agent}(e, \llbracket S \rrbracket) \ \& \ \text{Theme}(e, \llbracket O \rrbracket) \ \& \ \llbracket \text{MR} \rrbracket(\dots)(e)]$
 b. $\lambda e[\text{Theme}(e, \llbracket S \rrbracket) \ \& \ \llbracket \text{MR} \rrbracket(\dots)(e)]$

S is the surface subject, but I assume that intransitive resultatives are unaccusative clauses. S is an object underlyingly, interpreted as the theme of the clausal event. I defend this explicitly in Williams (accepted); see also Ma 1987 (425–6), Huang 1992 (128–9), and Sybesma 1999 (38–44).

This semantics expresses a familiar idea: in sentences with ‘causative’ meaning, S and O name the ‘causer’ and ‘causee.’ (29) renders these roles as the agent and theme of a process or change. For Mandarin this view is developed in Li 1990 and 1995; see also Huang 1992. For English it finds expression in Goldberg and Jackendoff 2004, for example, which develops analogous aspects of Jackendoff 1990 and Goldberg 1995. The OR semantics goes against a common view, however, which would assign (1) a meaning like (30) (Dowty 1979, Parsons 1990, Levin and Rappaport Hovav 1995, Kratzer 2005). Here S and O have thematic relations only to the events of M and R, in disagreement with (29).

- (30) Cause(‘Lee cut the bone’, Become(‘the bone be open’))

Following Parsons 1990 and Pietroski 2005, I assume that the theme of a change or process is the theme of the event that ends it. This is ‘what it means’ to undergo a process or change. Using our relation \mathcal{K} , we can state this as in (31), echoing Parsons (1990:119) on “BECOME.”⁶ Were \mathcal{K} decomposed as in (24), a similar postulate would instead govern the End relation.

- (31) $\Box \forall e_1 e_2 e_3 [\mathcal{K}(e_1, e_2, e_3) \rightarrow \text{Theme}(e_1, x) \equiv \text{Theme}(e_3, x)]$

Given (31), the phrase that names the theme of the event of MR also controls R as a necessary consequence. Therefore the OR semantics in (29) is alone sufficient to entail that control goes to O in a transitive and to S in an intransitive; it is not necessary to also state a thematic relation to the event of R itself. Presuming as I do that intransitive resultatives are unaccusative, this means in turn that control is always by a direct object underlyingly. Thus given (31), the “direct object restriction” (Simpson 1983, Levin and Rappaport Hovav 1995) is explicitly an instance of the generalization that the theme of a clause’s event will be its object, promoted to subject in the absence of an agent (Fillmore 1968, Jackendoff 1972, Perlmutter 1978). In Williams (accepted) I argue that this is the most explanatory derivation the direct object restriction, and that this, among other facts, argues strongly in favor of the OR semantics. Here I take this for granted.

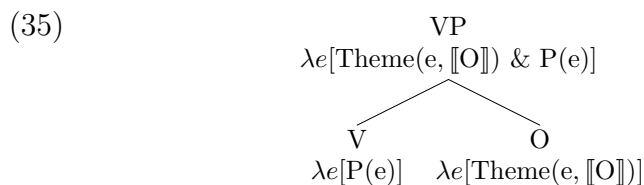
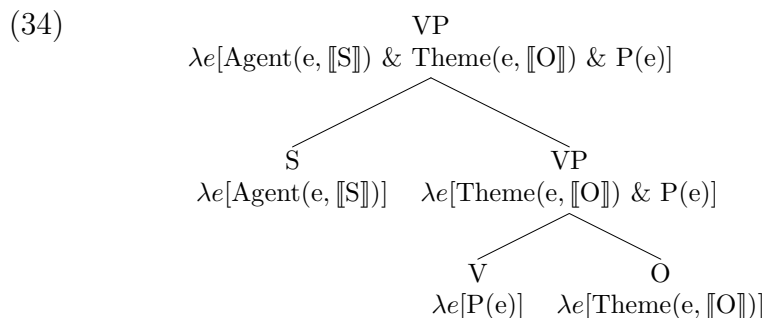
3.2 Verbs and arguments

Developing ideas in Huang 1992 and Sybesma 1999 in the setting of Carlson 1984 and Kratzer 1996, and in general agreement with Lin 2001, I argue in Williams 2005 and 2008 for the *No Argument Theory* of Mandarin and Igbo, or NAT. This is the

claim that in these languages, verbs characteristically have no arguments lexically. Semantically I take this to mean that the verb is interpreted simply as a function from events to truth values, like the examples in (32) and (33), from Mandarin and Igbo respectively.⁷ Syntactically, it means that the verb, while it has subcategorial features that may themselves be selected, does not itself express a requirement to combine with a dependent.

- (32) a. $\llbracket qie \text{ 'cut' } \rrbracket = \lambda e[\text{Cutting}(e)]$
 b. $\llbracket cai \text{ 'tread on' } \rrbracket = \lambda e[\text{TreadingOn}(e)]$
- (33) a. $\llbracket ku \text{ 'strike' } \rrbracket = \lambda e[\text{Striking}(e)]$
 b. $\llbracket gwu \text{ 'dig out' } \rrbracket = \lambda e[\text{DiggingOut}(e)]$

Thematic relations, if not introduced by the verb, are introduced by something in its context. Something other than the verb, either a head (Kratzer 1996, Marantz 1997) or an interpreted syntactic relation (Carlson 1984, Pietroski 2005), imposes an Agent relation on (what surfaces as) S, and a Theme relation on (what surfaces as) O. Here I will say nothing more specific than that, and use (34) and (35) to illustrate the idea as crudely as possible, outlining the underlying verb phrases for transitive and unaccusative clauses, respectively.



Plugging *cai* ‘tread on’ from (32b) into (34), we derive (36b) as the meaning for (36a).⁸

- (36) a. XiaoWei cai -le haojige pingguo.
 X.W. tread on -PFV many apple
 ‘Wei tread on a good many apples.’
- b. $\lambda e[\text{Agent}(e, \text{Wei}) \ \& \ \text{Theme}(e, \text{apples}) \ \& \ \text{TreadingOn}(e)]$

Next I make two assumptions about the structure of resultatives. First, that MR occurs in the same kind of structural context as a simple verb does. For instance,

cai lan ‘tread-on mushy,’ *ku wa* ‘strike split’ and *cut open* occur in the same context as do *cai* ‘tread on,’ *ku* ‘strike’ and *cut* on their own, namely the V slot in (34) or (35). Second, I repeat the standard assumption (Thompson 1973, Lord 1975, Y. Li 1990, Larson 1991, Huang 1992, Ihiõṅṅ 1992, Hale et al. 1995) that M contains nothing but the verb itself, hence no structure to introduce a thematic relation.

Given the first assumption, plus (34) and (35), S and O will name the agent and theme of the MR event, delivering the OR semantics. Given the second assumption, plus no-argument verb meanings like those in (33), the meaning of a resultative in Mandarin or Igbo will state no relations whatsoever to the event described by M. The Mandarin transitive (37a) will mean (37b), for example, and intransitive (38a) will mean (38b). Here the only stated thematic relations are to the event of MR.

- (37) a. Xiao Wei *cai lan* -le haojige pingguo.
 X.W. tread on mushy -PFV many apples
 ‘Wei made the apples mushy from treading on [them].’
 b. $\lambda e_1 \exists e_2 \exists e_3 [\text{Agent}(e, \text{Wei}) \ \& \ \text{Theme}(e, \text{apples}) \ \& \ [\mathcal{K}(e_1, e_2, e_3) \ \& \ \text{TreadingOn}(e_2) \ \& \ \text{Mushy}(e_3)]]$
- (38) a. Haojige pingguo *cai lan* -le.
 many apple tread on mushy -PFV
 ‘A good many apples got mushy from treading on [them].’
 b. $\lambda e_1 \exists e_2 \exists e_3 [\text{Theme}(e, \text{apples}) \ \& \ [\mathcal{K}(e_1, e_2, e_3) \ \& \ \text{TreadingOn}(e_2) \ \& \ \text{Mushy}(e_3)]]$

Given the Third Event Assumption in (25), thematic relations to the event of MR do not entail any relations to an event satisfying M. With respect to M, therefore, the meaning of a resultative sentence in Mandarin or Igbo does not itself restrict the interpretation of S and O. Absent any further meaning postulates for \mathcal{K} , understood relations to the means event must be pragmatic enrichments meant by the speaker, informed by world knowledge and consistent with the sentence meaning: S and O are the agent and theme of a process that ends with R and is achieved by means of M. This restriction is substantial, since it entails ‘direct causation’ and requires that S and O name co-participants in a single event (Pietroski 2005:188).

For English, on the other hand, I claimed that verbs do characteristically have lexical arguments. Transitive verbs have at least their implied theme as an argument (Kratzer 1996); for example, *strike* and *cut* have meanings with the outlines of (39). Whether they also have their agents as arguments is a question we will turn to below.

- (39) a. $[[\textit{strike}]] = \lambda y \dots \lambda e [\dots \text{Theme}(e, y) \ \& \ \text{Striking}(e)]$
 b. $[[\textit{cut}]] = \lambda y \dots \lambda e [\dots \text{Theme}(e, y) \ \& \ \text{Cutting}(e)]$

Arguments of M are inherited by MR. Thus *cut open* will have a meaning like (40), inheriting the theme argument of *cut* from (39b). All else equal, therefore, this role will come to be bound by a dependent in the resultative clause, specifically O.

$$(40) \quad \llbracket \textit{cut open} \rrbracket = \lambda y \dots \lambda e_1 \exists e_2 \exists e_3 [\dots \mathcal{K}(e_1, e_2, e_3) \ \& \ [\dots \textit{Theme}(e, y) \ \& \ \textit{Cutting}(e)] \ \& \ \textit{Open}(\dots)(e_3)]$$

Unlike in Mandarin and Igbo, therefore, interpretation with respect to the M event is restricted in the sentence meaning. The verb in M has arguments and these project to S or O. For details about the derivation, see Williams 2005 and 2008.

I will now describe some of the data that these proposals are meant to account for, concerning the interpretation of O relative to the means event.⁹

3.3 Themes in resultatives

(41) is a familiar kind of example. Here *her throat* controls R, but does not tell us what Mo sang.

(41) Mo sang her throat hoarse.

Thus the controller of R does not always name the theme of the means event. In English this possibility is restricted, however. As a rule it is available only when the verb in M is on its own acceptable in unergative clauses, as *sing* is in (42) (Dowty 1979:222, Carrier and Randall 1992:187, Levin and Rappaport Hovav 1995:39).

(42) Mo sang.

The verb *cut* is stubbornly transitive, and not generally good in unergative clauses such as (43).¹⁰ Thus O in (44) must name what was cut, and (45) is unacceptable.

(43) * Lee cut.

(44) Lee cut the bone open.

(45) * Lee cut the knife dull.

‘Lee made the knife dull from cutting [with it].’

This is what we expect, given our theory. The transitive verb in M projects its theme argument, deciding the interpretation of O.

For Mandarin the prediction is different. The controller of R should not be restricted relative to M, even when the verb there is transitive. And this is indeed what we find (Lü 1986, Ma 1987, Y. Li 1990, Tan 1991, among others). O need not name the theme of the M event, even when the verb in M is transitive, as in (46).

- (46) a. Ta hai qie dun -le nide caidao.
 3s also cut dull -PFV your food knife
 ‘He also made your cleaver dull from cutting.’
 (adapted from Ma 1987:428)
- b. Wo tai zhong -le jianbang.
 1s carry swollen -PFV shoulder
 ‘I made [my] shoulders swollen from carrying.’

This cannot be explained by positing a *pro* object for M, since the sentence cannot accommodate a second object overtly. And in any case, the sentences in (46) may be used felicitously even when the theme of the M event is not topical or salient.

Igbo lacks object *pro* entirely, and yet shows exactly the same pattern. The verbs *bi* ‘cut’, *gwu* ‘dig out’ and *tụ* ‘throw’, for example, are transitive. On their own they occupy transitive clauses, with direct objects that must name what was cut, dug out, or thrown. They are generally unacceptable in unergative clauses. Yet these same verbs are also natural in (47), where O need not name what was cut, dug out, or thrown. A speaker of (47c), for example, may mean to convey either that Obi has thrown the gourd or that he has thrown something at it.

- (47) a. Obi bi kpụ -rụ mma.
 O. cut dull -FACT knife
 ‘Obi made the knife dull by cutting [with it].’
- b. Obi gwu ji -ri ọgụ.
 O. dig out snap -FACT hoe
 ‘Obi made his hoe snap by digging out [with it].’
- c. Obi tụ pu -ru ọba ahụ.
 O. throw have hole -FACT gourd that
 ‘Obi made the gourd have a hole in by throwing [something at it].’
 (Igwe 1999)

This pattern is systematic and robust, across transitive verbs. It is even recognized in Igwe 1999, a dictionary which lists common MR combinations. Igwe often glosses these as having several salient readings, differing in the understood relation of O to M. (47c) is one example.

What goes for O in a transitive, moreover, goes equally for S in an intransitive. There the interpretation of S is again unrestricted relative to M. I show this using Igbo in (48).¹¹ See also the Mandarin examples in (59) below.

- (48) a. Mma ahụ bi kpụ -rụ ebikpụ.
 knife that cut dull -FACT BVC
 ‘That knife got dull from cutting [stuff].’
- b. Ọgụ ya gwu ji -ri egwuji.
 hoe 3s dig out snap -FACT BVC
 ‘His hoe got snapped from digging out [stuff].’
- c. Ọba ahụ tụ pu -ru atụpu.
 gourd that throw have hole -FACT BVC
 ‘That gourd got a hole in it by throwing [it/something at it].’

These facts motivate the claim that Mandarin and Igbo verbs do not have implied themes as arguments. The remainder of the paper, however, concerns the implied agent of the verb in M. And here Igbo differs from both Mandarin and English.

4 Agentive verbs in intransitive resultatives

Igbo *ky* ‘strike’ is not an unaccusative verb, witness (49). When it exhausts the predicate in a basic clause, that clause must be transitive, as in (50). There must be a dependent to bind the role of striker.

(49) *Ọba ahụ kụ -rụ akụ.
gourd that strike -FACT BVC
‘That gourd got struck.’

(50) Ọ kụ -rụ ọba ahụ.
3sS strike -FACT gourd that
‘S/he struck that gourd.’

But this is not so when *ky* ‘strike’ inhabits M in a resultative, such as *ky wa* ‘strike split.’ Then we do find it in unaccusative clauses, with nothing naming the striker (Nwachukwu 1987, Uwalaka 1988, Hale et al. 1995). (51) has *ky wa* ‘strike split’ in a clause that is manifestly intransitive (see note 11).¹² Here *ọba ahụ* ‘that gourd’ is the subject, and no dependent binds the role of striker.

(51) Ọba ahụ kụ wa -ra akụwa.
gourd that strike split -FACT BVC
‘That gourd split from striking.’ (Hale et al. 1995)

This is not a special case. As suggested by the examples in (48) above, many transitive verbs can occupy M in an intransitive resultative—though not all, as we will see.

Mandarin is arguably the same, though this is harder to see in a *pro*-drop language with no morphological marking of subjects. Tan (1991) argues that (52), with the resultative predicate *tui fan* ‘push over,’ has an intransitive parse where *na liang che* ‘which car’ is the subject, and not a fronted object.¹³

(52) Na liang che tui fan -le?
which CLS car push reverse -PFV
‘Which car was pushed over?’ (adapted from Tan 1991:79)

Here no argument names the pusher. And yet the verb *tui* ‘push’ does not on its own occur comfortably in unaccusatives, (53). It is a transitive verb.

(53) ?*Na liang che tui -le?
which CLS car push -PFV
‘Which car was pushed?’ (ibid)

English, of course, is different. MR can occupy an unaccusative clause, with no agent for the verb in M, only when that verb can do the same on its own. So while *freeze solid* and *slap red* can both occur in transitive resultatives, (54), only the former occurs in intransitives, (55), since only *freeze* can do the same, (56).

- (54) a. The January temperatures froze the lake solid.
 b. Mo slapped Lee's face red.
- (55) a. The lake froze solid.
 b. *Lee's face slapped red.
- (56) a. The lake froze.
 b. *Lee's face slapped.

How should we understand this? The English data suggest that MR inherits its transitivity entirely from M. Applied to Mandarin and Igbo, this would imply that verbs such as Mandarin *tui* 'push' or Igbo *ku* 'strike' have two lexical entries, one transitive and the other intransitive, to allow for both transitive and intransitive resultatives, respectively, with these verbs in M.¹⁴ But this is unsatisfactory. The intransitive lexical entry would only ever occur inside of a resultative, never on its own. And why should this be? The better view, it seems to me, is that the distribution of MR is determined compositionally, not only by M but also by other parts of the construction. The pattern is simply eclipsed in English, where agentivity is evidently by itself sufficient to exclude a predicate from unaccusative clauses. In other languages the conditions are weaker.

Discussing Mandarin, Tan (1991:80) suggests that telicity is a relevant factor. The predicate in an unaccusative clause must be telic, she suggests, and *tui fan* 'push over' is telic while *tui* 'push' on its own is not. This recalls observations in Smith 1978, Van Valin 1990, Dowty 1991, Levin and Rappaport Hovav 1995, and elsewhere. In general the predicate in an unaccusative clause describes a substantive change or 'activity' in the referent of its subject, where 'activity' includes at least movement and emission of sound or light (Levin and Rappaport Hovav 1995).¹⁵ (58) gives examples.

- (57) Theme condition on simple unaccusative clauses
 An unaccusative clause, unless passive or stative or middle,¹⁶ describes its event as involving a substantive change or activity in its theme, the referent of its surface subject.
- (58) My phone cracked / vibrated / beeped / glowed.

For Mandarin, this covers a lot of ground. Most any telic predicate, and specifically any predicate of change in Mandarin, can occur in unaccusative contexts. A resultative that can be transitive can also be intransitive, no matter what verb is in M. (59) gives a variety of examples that will be relevant below.

- (59) a. Na ba dao qie dun -le?
 which CLS knife cut dull -PFV
 'Which knife got dull from cutting?'
- b. Ji ge pingguo cai lan -le?
 how many CLS apple tread on mushy -PFV
 'How many apples got mushy from treading [on them]?'

- c. Na gen qianbi xie zhe -le?
 which CLS pencil write snap -PFV
 ‘Which pencil snapped from writing?’ (adapted from Ma 1987:424)
- d. Sheide shoupa ku shi -le?
 whose handkerchief cry wet -PFV
 ‘Whose handkerchief got wet from crying?’

But (57) is grossly insufficient for English or for Igbo. English *slap red* describes a change, and yet (55b) is ungrammatical. For Igbo, Hale et al. 1995 observe that *ku* ‘strike’ in (51) cannot be replaced with *zo* ‘tread on’ in (60), in contrast to Mandarin (59b). In these languages, there must be conditions in addition to (57).

- (60) *Oba ahụ zo wa -ra akwā.
 gourd that tread on split -FACT BVC
 ‘That gourd split from treading.’ (Hale et al. 1995)

In English the further condition seems to be (61). An unaccusative clause, unless passive or middle or stative, must describe its event as conceivably spontaneous, and not necessarily brought about with the involvement external agent (Fillmore 1970, Smith 1978, Van Valin 1990, Levin and Rappaport 1995).

- (61) Agent condition on unaccusative clauses in English
 An unaccusative clause, unless passive or middle or stative, describes its event as conceivably spontaneous, not necessarily brought about with the involvement of an external agent.

You cannot get slapped unless somebody slaps you, but at least as we normally view things, a lake can freeze without anything freezing it. (61) therefore allows *freeze* but not *slap* as the predicate in unaccusative clauses. Now consider resultatives. When M entails an agent, MR describes its event as achieved by means of an event with an agent. We can interpret (61) as excluding such a predicate from unaccusative clauses. And if we do, then although *slap red* and *freeze solid* both describe changes, as per (57), only the latter abides by (61) and is therefore permitted in (56). MR will occur in unaccusative clauses only if its M can do the same.

Before returning to Igbo, let me sketch one formalization of these ideas within my general framework. I would like to show how they might be implemented without presuming that agentive verbs ever have their implied agents as arguments—thus preserving the NAT for Igbo, and allowing for the possibility that agents are not arguments of the verb in English either (Schein 1993, Kratzer 1996).

Suppose that the predicate of a clause, pretheoretically its verb phrase, is headed by a functional item of category *v* (Chomsky 1995, Kratzer 1996, Marantz 1997). We can then stipulate that in unaccusative clauses this *v* selects a complement with the feature [c] and without the feature [a]. And now let us assume that in all three of our languages, expressions with [c] are all and only those which describe

their event as involving “substantive change or activity in its theme.” Accordingly, any resultative predicate MR should have the feature [c], contributed by whatever introduces the meaning of the construction; the feature cannot come from M or R, since it may be that neither describes an event with an active or changing theme. The semantic category of predicates with [a], on the other hand, varies by language. In English the predicates with [a] are those that describe their event as having an agent. In Igbo they are some subset of these, including *zọ* ‘tread on’ but not *ky* ‘strike.’ And in Mandarin, where M seems never to keep a resultative from being intransitive, there are perhaps no verbs with [a]. The observed patterns would then follow, provided that MR has [a] whenever its M does.

On this account, we need not say that a verb with [a] itself has an agent as an argument. Its semantic value needn’t be a function over agents, and it need not select syntactically for a certain kind of DP. But we do need to say something about headedness. Any complex expression inherits features derivationally from just one of its parts, therefore called its head. But MR seems to have features from more than one source. It has [a] because of M, and [c] because of “whatever introduces the meaning of the construction.” Here is a way to resolve this tension. Assume that “whatever introduces the meaning of the construction” is the head of MR, and call this part K. Now let K have either of two syntactic categories: either it has [a] and selects for a complement which itself has [a], or it lacks [a] and selects for a complement without [a]. MR then inherits features from just one of its parts derivationally, but this head happens to echo the category of its complement. This is a familiar kind of solution. It is like saying that *the bone* and *the bones* both have *the* and not *bone(s)* as their head—but the determiner occurs in either of two subcategories. One is marked singular and also selects for a singular complement, the other is marked nonsingular and selects for a nonsingular complement. The case of finite and nonfinite complementizers is similar.

Back to the Igbo data. In our present terms, the descriptive question is which verbs have [a]. Clearly some verbs have it, unlike in Mandarin. And clearly the category is not defined by (61), as it is in English: strikings involve an agent, and yet Igbo (51) is fine, with *ky wa* ‘strike split’ in an unaccusative clause. So then what does makes the difference between *ky wa* ‘strike split’ and *zọ wa* ‘tread split’? The answer is not clear to me, but I would like to venture some observations.

Hale et al. 1995 suggest it may matter that *zọ* ‘tread on’ is instrumental, in that treading involves feet. This does not seem likely, however, as verbs like *bi* ‘cut with a knife’ and *kpọ* ‘chop’ are fine in intransitives, as are *sọ* ‘prick’ and *hyi* ‘sweep.’

(62) Mma ahụ bi kpụ -rụ ebikpụ.
knife that cut dull -FACT BVC
‘That knife got dull from cutting.’

(63) Nkụ kpọ wa -ra akpọwa.
firewood chop split -FACT BVC

‘The firewood got split from chopping.’ (Nwachukwu 1987:102)

Moreover, there are many unacceptable intransitives that do not involve instrumental verbs, as in (64) for example.¹⁷ Compare these to Mandarin (59) above.

- (64) a. *Osi ahụ b'e ji -ri eb'ejì.
wood that perch on snap -FACT BVC
‘That branch got snapped from perching [on it].’
- b. *Akwa kpu wa -ra ekpuwa.
egg brood split -FACT BVC
‘The eggs got split from brooding [them].’
- c. *Tebul ahụ wụ wa -ra awụwa.
table that jump split -FACT BVC
‘That table got split from jumping [on it].’
- d. *Akisi be de -re (n' akwa) ebede.
hanky cry wet -FACT (PREP weeping) BVC
‘The hanky got wet from crying [into it].’
- e. *Pensul m de ji -ri edeji.
pencil 1sPOSS write snap -FACT pencil
‘My pencil got snapped from writing [with it].’

The examples in (64) hint that (65) may be a better hypothesis. The predicate of an unaccusative clause cannot be defined in terms of traits of an animate (or quasi-animate) creature.

- (65) Animacy condition on unaccusative clauses in Igbo
The meaning of a predicate in an unaccusative clause cannot be defined in terms of the traits of an animate creature.

Treading requires mobile feet, and mobile feet are in the first instance a trait of animate creatures. Plausibly, therefore, *zo wa* ‘tread-on split’ is defined in terms of an animate agent, and so is excluded from unaccusative contexts by (65). Likewise it is animate creatures who perch, brood, jump, and weep.¹⁸ And though we may say that machines can write, mechanized mark-making counts as writing only relative to intentional conventions of human beings. So in this way (64e) too falls under (65), as I intend it. *Ku* ‘strike,’ on the other hand, makes no reference to animates. It simply describes a kind of forceful impact. Thus *ku wa* ‘strike split’ complies with (65) and is possible in unaccusative clauses. Similarly for *hiọ pia* ‘rub crushed’ in (66): events of rubbing only require two moving surfaces, neither one of which needs to be animate.

- (66) Anwuta ahụ hiọ pia -ra ahiọpia.
mosquito that rub crushed -FACT BVC
‘That mosquito got crushed from rubbing.’

Unfortunately, there are cases not easily subsumed under (65). Igbo speakers I have consulted do not reject intransitive resultatives with *ta* ‘chew’ and *bu* ‘carry on the head’ in M, for example. If there is some sense in which chewing and carrying on the head are not “defined in terms of the traits of animate creatures,” it is not clear to me. Further work is needed, therefore, to determine the semantic correlates of being an [a] verb in Igbo.

5 Nonagentive subjects of transitive resultatives

I proposed in section 3.1 that, in both Mandarin and Igbo, a resultative clause has the very spare semantics in (67), where *M* and *R* are functions from events to truth values that give the meanings of M and R.

$$(67) \quad \lambda e_1 \exists e_2 \exists e_3 [\text{Agent}(e, \llbracket S \rrbracket) \ \& \ \text{Theme}(e, \llbracket O \rrbracket) \ \& \ \mathcal{K}(e_1, e_2, e_3) \\ \& \ M(e_2) \ \& \ R(e_3)]$$

(67) states no thematic relations between the event of M and the referents of either S or O. For O we have seen evidence that this is right; for example, (68) is true whether Chidi dug out his hoe, or dug out other stuff using his hoe.

$$(68) \quad \text{Chidi gwu} \quad \text{ji} \quad \text{-ri} \quad \text{oḡu ya.}$$

C. dig out snap -FACT hoe 3s
‘Chidi made his hoe snap from digging out.’

But S is a different story. Given just (67), (69) should be acceptable with the given interpretation. This sentence is just like (68), except in how we mean the referent of S to relate to the event of M. Here we mean it to be not the digger but the thing dug out, and this is unacceptable.

$$(69) \quad * \text{Ji} \quad \text{ahụ gwu} \quad \text{ji} \quad \text{-ri} \quad \text{oḡu ya.}$$

yam that dig.out snap -FACT hoe 3s
‘That yam made his hoe snap from [someone’s] digging [with it].’

This represents a categorical fact about Igbo: whenever a transitive resultative has an agentive verb in M, S names the agent of its event. In this way Igbo is like English, where sentences as in (70) are impossible. Both languages accord with (71).

$$(70) \quad \text{a.} \quad * \text{That dough pounded my fist sore.}$$

‘That dough made my fist sore from pounding [it].’

$$\text{b.} \quad * \text{The intro sang Mo hoarse.}$$

‘The intro made Mo hoarse from singing [it].’

$$(71) \quad \text{Resultative Agent Observation (RAO)}$$

When a transitive resultative has an agentive verb in M, S names the agent of its event.

There is a striking contrast with Mandarin, however, where (71) does not apply (Ma 1987, Li 1990, 1995, Tan 1991, Gu 1992, Wang 1995, Ren 2001). Sentences like those in (72) are frequently acceptable.

- (72) a. Yifu xi lei -le jiejie.
 clothes wash tired -PFV elder sister
 ‘The clothes made big sister tired by [her] washing [them].’
 (Ren 2001:326, my translation)
- b. Na shou gequ chang ya -le wo sangzi.
 that CLS song sing hoarse -PFV 1s throat
 ‘That song made my throat hoarse from [my] singing [it].’
- c. Na gen gutou qie dun -le wode caidao.
 that CLS bone cut dull -PFV my food knife
 ‘That bone made my knife dull from cutting [it].’

Thus any theory designed to account for the freedom of Mandarin, including the NAT, will not extend to Igbo without elaboration.

What, then, is the best elaboration? Why in Igbo but not Mandarin does S in a transitive resultative name the agent of an agentive verb in M? And how can we describe the difference between Igbo and Mandarin without neglecting what they share? In sections 5.1 and 5.2 I consider how to answer these questions while preserving the OR semantics and the NAT, starting with the answer that I find least unattractive. Then in section 5.3 I discuss what options are available if we reject the NAT, concluding that they offer no special advantages, whether or not we have an OR semantics. In section 5.4 I observe a problem posed by transitive resultatives in Igbo with apparently *non*-agentive verbs in M, specifically *d’a* ‘fall.’ Finally in 5.5, I compare my conclusion with the suggestion that transitive resultatives in Mandarin differ from those of Igbo or English in the thematic interpretation of S.

5.1 The Resultative Agent Postulate

The first response to our questions makes no structural distinctions between Igbo and Mandarin. It simply adds a meaning postulate to the one language but not the other, called RAP in (73). We could assume that the RAP holds in English as well.

- (73) Resultative Agent Postulate (RAP)
 The agent of the process described by a resultative must be the agent of its reported means event: $\Box \forall e_1 e_2 e_3 [\mathcal{K}(e_1, e_2, e_3) \rightarrow \text{Agent}(e_1, x) \equiv \text{Agent}(e_2, x)]$

Any such postulate is initially disappointing. It makes no predictions, and follows from nothing else. In particular, contrary to the occasional suggestion that a ‘causer’ is simply the agent of an event that directly causes something, it does not follow

from our normal understanding of changes and processes. When I cut a bone with a saw, the bone may dull my saw. In that case the bone is the agent of the dulling process, but not of anything else. It simply resists the action of my cutting. The cutting, moreover, surely causes the dullness, and does so quite directly. So (74) does not conflict with how we think about changes or processes. Nor does Igbo (69). The thoughts these sentences are meant to express are perfectly natural. Indeed they are thoughts that can be expressed with comparable clauses in Mandarin.

- (74) *The bone cut my saw dull.
 ‘The bone made my saw dull from cutting.’

So the RAP has no deep motivation. And one cannot say that it expresses some notion of change or causation that is parochial to language, since it does not apply in Mandarin. Perhaps worse, the RAP must apply only to the “reported” means event, the one described by M. For plainly the agent of a process need not be the agent of *every* event by means of which it is achieved. This is an oddly formal restriction for what is supposed to be a meaning postulate.

That said, unexplained restrictions like this seem to be common in the domain of resultatives. Green (1972:84) judges the sentences in (75) unacceptable, and English speakers generally agree with her. But there is no settled account of why, when the variants in (76) are unobjectionable (though see Goldberg 1995:195).

- (75) a. *She shot him lame.
 b. *He hammered it tubular.
- (76) a. She shot him dead.
 b. He hammered it flat.

Similarly, Japanese speakers accept (77a) but reject (77b) (Washio 1997:9).

- (77) a. John -wa niku -o yawaraka -ku ni -ta.
 J. -TOP meat -ACC soft -INFIN boil -PAST
 ‘John boiled the meat soft.’
- b. # John -wa niku -o yawaraka -ku tatai -ta.
 J. -TOP meat -ACC soft -INFIN pound -PAST
 ‘John pounded the meat soft.’

Washio (1997) subsumes this under the generalization that Japanese only allows “weak resultatives.” In a weak resultative, M “strongly implies” a (“tendency towards”) a particular result, and R entails a state characteristically associated with that result. According to Washio, boiling “strongly implies” a result correlated with softness, but pounding does not. Despite Washio’s insights, however, there is no accepted account of why this restriction should hold in Japanese, or why Japanese should differ in this way from Mandarin, Igbo and English. In particular it has not been convincingly tied to variation in the structure or logical form of the resultative construction.

Perhaps the Igbo rejection of sentences like (69) has a similar character. Speakers of Igbo and Mandarin share the same basic understanding of change, and the same structure for resultatives, syntactic and semantic. But resultatives just have a slightly narrower meaning in Igbo, which adds a condition that Mandarin does not, the RAP. We can still assume that the Means relation is one of only a few that UG provides to interpret a complex predicate.¹⁹ All the RAP forces us to accept is that languages may add to this in various limited ways, narrowing the constructional meaning. Here is a fictional analogy. Suppose there were several languages where a certain construction is interpreted by disjunction. Should we be distressed if in some other languages the analogous construction has the slightly narrower meaning of exclusive disjunction? Or should such additions be seen as tolerable?

In any case, while the RAP is at first unattractive, the postulate is warranted if making it allows for simplification elsewhere. And as we will now see, without RAP, there will be real complications to the grammar, whether or not we accept the NAT.

5.2 Other responses within the NAT

Without the RAP, I see two responses that preserve the NAT. One says that in Igbo but not Mandarin, M includes more than just the verb. It also contains structure that introduces an Agent relation. Suppose with Kratzer 1996 that agents are introduced by a silent morpheme called *Ag*. Then MR would have a syntax like (78a) and a meaning like (78b). Crucially, (78b) provides an explicit agent relation for e_2 , the means event.

- (78) a. $[^{MR} [^M \dots \text{Ag} [V \dots]] [^R V \dots]]$
 b. $\dots \lambda e_1 \exists e_2 \exists e_3 [\mathcal{K}(e_1, e_2, e_3) \ \& \ [\text{Agent}(e_2, x) \ \& \ M(e_2) \dots] \ \& \ [R(e_3) \dots]]$

Now suppose we ensure that this agent role for M is bound by S, not O. Technically this is no small matter (Williams 2005), but let us imagine it can be done in an acceptable way. The facts of Igbo will then follow. S will necessarily be interpreted as naming the agent of the M event.

But problems arise when we imagine a transitive verb in M, like *ku* ‘strike’ or *gwu* ‘dig out.’ When such a verb is on its own, it cannot occupy an unergative clause. Thus its immediate context will of necessity include the structure to introduce not only an agent but also a theme—a complete transitive verb phrase. And yet it is necessary that this restriction *not* apply when the verb is in M, since in Igbo there is no requirement that any dependent ever name the theme of the M event. This makes for a puzzle. Why is a transitive verb allowed to occur without a theme dependent exactly and only when it occupies M? Why should the resultative context have exactly this nonlocal effect on what is licensed inside of its M component? I see no good answer, and therefore reject this first line of thinking.

The second response, still within the framework of the NAT, is to reject the Third Event Assumption in (25). Perhaps in Igbo, MR is a predicate of the very same event as M is, as stated in (79) (Parsons 1990, Kratzer 2005). Here \mathcal{C} means something like ‘directly causes’. The agent of the event described by MR would then be the agent of the M event. And therefore the subject of a transitive resultative would necessarily name the agent of M, as desired.

$$(79) \quad \llbracket \text{MR} \rrbracket = \lambda e_1 \exists e_2 [\dots \mathcal{C}(e_1, e_2) \ \& \ \llbracket \text{M} \rrbracket(e_1) \ \& \ \llbracket \text{R} \rrbracket(e_2) \dots]$$

But this is otherwise unattractive. The interpretation of adverbs forbids (79), and requires the TEA—a dispositive flaw, in my view. In addition, (79) rules out an OR semantics. We could not assume that O in a resultative is interpreted as the theme of its event, since it would then always name the theme of the M event, contrary to fact. Without an OR semantics, the NAT would lose an important attraction. We could not say that resultative complex predicates occur in the same structural contexts as do simple, one-verb predicates: *ku* ‘strike’ would occur in a context where O is interpreted as the theme of its event, but *ku wa* ‘strike split’ would not.

5.3 Responses without the NAT

Now consider our options if we reject the NAT. We could then say that Igbo verbs do have at least their agent as a lexical argument. The verb *gwu* ‘dig out,’ for instance, might then have a meaning with the outlines of (80).

$$(80) \quad \llbracket \textit{gwu} \text{ ‘dig out’} \rrbracket = \dots \lambda x \lambda e [\text{Agent}(e, x) \ \& \ \dots \text{DiggingOut}(e)]$$

This agent argument is then inherited by any resultative complex predicate in which the verb occurs, so that *gwu ji* ‘dig-out snap,’ for example, has a meaning like (81).

$$(81) \quad \llbracket \textit{gwu ji} \text{ ‘dig out snap’} \rrbracket = \dots \lambda x \lambda e_1 \exists e_2 \exists e_3 [\mathcal{K}(e_1, e_2, e_3) \ \& \ \text{Agent}(e_2, x) \ \& \ \text{DiggingOut}(e_2) \ \& \ \text{Snapping}(e_3) \dots]$$

The facts of Igbo would then follow if this agent argument is necessarily bound by S, regardless of whether *gwu* occurs on its own, or within a transitive resultative. Let us again ignore technical details, and assume this can be ensured in a natural way, via a Thematic Hierarchy or otherwise. To account for intransitive resultatives where the agent role of M is not assigned, as in (82), we can in turn assume an operation analogous to passive, call it **Detrans**. **Detrans** eliminates the agent argument syntactically, and semantically binds its thematic relation with an existential quantifier, as in (83).

$$(82) \quad \begin{array}{l} \text{Ogụ ya gwu ji -ri egwuji.} \\ \text{hoe 3s dig out snap -FACT BVC} \end{array}$$

‘His hoe snapped from digging out [stuff].’

$$(83) \quad \text{Detrans}(\llbracket \textit{gwu ji} \rrbracket) = \dots \lambda e_1 \exists x \exists e_2 \exists e_3 [\mathcal{K}(e_1, e_2, e_3) \ \& \ \text{Agent}(e_2, x) \ \& \ \text{DiggingOut}(e_2) \ \& \ \text{Snapping}(e_3) \dots]$$

So far so good. But again problems arise when we consider the entailed theme of the verb. Is this also an argument of the verb? Suppose first that the answer is Yes, so that transitive verbs have not only their agent but also their theme as a lexical argument. This will give *gwu* a meaning like (84).

$$(84) \quad \llbracket gwu \text{ 'dig out'} \rrbracket = \lambda y \lambda x \lambda e [\text{Agent}(e, x) \ \& \ \text{Theme}(e, y) \ \& \ \text{DiggingOut}(e)]$$

But again, in Igbo a transitive verb in M need not realize its theme. So we would have to say that a verb in M, while it must project its agent argument, need not project its theme argument. In effect we would have to stipulate that in M, a transitive verb is antipassivized, optionally or always, and yet never passivized. But why should this be? And why should it be in Igbo but not English? I see no good answer.

I can imagine the following retort: maybe in Igbo, all the arguments of a verb in M are eliminated indiscriminately. Perhaps this is an effect of ‘compounding,’ the direct combination of two lexical items, as suggested in McIntyre 2004. This would explain the difference between Igbo and English. And we would be at no disadvantage compared to the NAT, since the result of eliminating arguments is the same as never having any. Whatever the proponent of the NAT says, we could say here. But for three reasons this is less attractive than the NAT. First, there is no reason why compounding should eliminate arguments. Second, there seem to be many languages with resultative ‘compounds’ that do not behave like Igbo or Mandarin. And third, I argued in Williams 2008 that the Mandarin pattern is exhibited not only in ‘compounds,’ but whenever the verb combines with something other than a thematic DP (Lin 2001). I discussed the example of *V-de* constructions such as (85).

$$(85) \quad \begin{array}{l} \text{Wo (pai} \quad \text{Lao Wei-de mapi,)} \quad \text{kua} \quad \text{-de} \quad \text{lian} \quad \text{ta taitai} \quad \text{ye} \\ \text{1s (smack L.W.'s} \quad \text{horse rump,)} \quad \text{praise -DE} \quad \text{even} \quad \text{3s wife} \quad \text{also} \\ \text{buhaoyisi.} \\ \text{embarrassed} \\ \text{'(Flattering Lao Wei,) I praised [him] such that even his wife was embar-} \\ \text{rassed.'} \end{array}$$

According to L. Li 1963 and Huang 1992, the verb here forms a constituent, discontinuous on the surface, with the verb phrase to its right. In (85) this is *kua* ‘praise’ with *ye buhaoyisi* ‘also embarrassed.’ The two do not form a compound, since the secondary predicate is phrasal. Nonetheless, once again, no argument in the clause containing the complex predicate names the theme of its first verb’s event.

So suppose instead that transitive verbs in Igbo do not have their entailed theme as an argument, only their agent. Then *gwu* ‘dig out’ has a meaning like (86), and *gwu.ji* ‘dig-out snap’ in turn has a meaning like (87), requiring S to name the digger, but not restricting the interpretation of O.

$$(86) \quad \llbracket gwu \text{ 'dig out'} \rrbracket = \lambda x \lambda e [\text{Agent}(e, x) \ \& \ \text{DiggingOut}(e)]$$

$$(87) \quad \llbracket gwu.ji \text{ 'dig snap'} \rrbracket = \dots \lambda x \lambda e_1 \exists e_2 \exists e_3 [\mathcal{K}(e_1, e_2, e_3) \ \& \ [\text{Agent}(e_2, x) \ \& \ \text{DiggingOut}(e_2)] \ \& \ [\text{Snapping}(e_3) \dots]]$$

5.4 Nonagentive verbs in transitive resultatives

In sum, putting an agent argument inside of M, whether by adding syntactic structure or by giving the verb an argument lexically, raises as many questions as it answers. These complications put the RAP in a more favorable light: at least it allows us to keep the grammar simple. Exactly because the RAP is an ad hoc meaning postulate, it does no collateral damage to the mechanics of composition.

But there is a blunt empirical problem for the RAP solution. Igbo speakers accept transitive resultatives with *d'a* ‘fall’ in M where S names the faller, as in (92).

- (92) Osisi d’a bi -ri eriri.
tree fall in pieces -FACT rope
‘The tree made the rope go to pieces from [the tree] falling [into the rope].’

The RAP requires that S name the agent of the means event. But fallers are usually considered to be themes, at least in unintended fallings. (92) therefore demands one of two responses: either fallers do count as agents in Igbo, but not English, or the RAP does not govern Igbo resultatives.

The first response invokes an unexplained semantic distinction, as does the RAP itself. This is not nice, but what is the alternative? Suppose that fallers are always themes, and consequently that the RAP does not govern Igbo. (69) is then again without an account, and (93) creates a new problem. Most of my consultants reject the meaning in the gloss; for them S must name the faller, so that (93) can only mean that the farmer fell and thereby split the tree.

- (93) * Onye ọlụ ubi d’a ji -ri osisi.
farmer fall snap -FACT tree
‘The farmer made the tree snap from [its] falling.’

This fact would follow from the RAP, were fallers to count as agents in Igbo.²¹ But how should it be accounted for if they don’t? Presumably by giving *d'a* ‘fall’ the faller as an argument, and requiring that this be bound by the underlying subject. This is already unusual: an unergative verb whose subject is a theme. More importantly, it does not make the difference between Igbo and English any more natural. English analogues of (92) are unacceptable, as in (94).

- (94) * The trees fell my car flat.
‘The trees made my car flat from [their] falling.’

Consequently we would have to say that, while Igbo *d'a* and English *fall* both represent fallers as themes, and both have their implied theme as an argument, the former is unergative and the latter, unaccusative. Is this more attractive than assuming that the languages differ in whether fallers count as agents? The notion of ‘agent,’ to do the work linguists want it to do, must be extraordinarily vague (Dowty 1991, Baker

1997). Might we not assume that its vagueness is resolved somewhat differently in different languages, with fallers being sorted as agents in Igbo but not English? This seems a reasonable suggestion for cross-linguistic variation in the acceptability of so-called instrumental subjects—in some but not all languages, a wielded knife may count as the agent of a cutting—and perhaps it is also reasonable here.

5.5 MR or S?

To finish, let me compare the RAP to a more familiar suggestion from the literature on Mandarin. To explain Mandarin examples like (72), it is sometimes suggested Mandarin differs from English in the interpretation of S, and to English we can add Igbo: in Mandarin but not English or Igbo, S binds the role of “causer,” not “agent,” at least in cases like (72). Now, given an OR semantics for all three languages, S always binds a relation to the event of MR. So the hypothesis must be that the *content* of this relation differs across languages: it is, let us say, *C* in Mandarin and *A* in Igbo or English. The effect of the RAP could then be achieved by instead postulating that, if $\mathcal{K}(e_1, e_2, e_3)$, then $A(e_1, x)$ entails that x is the agent of e_2 , but $C(e_1, x)$ does not. This locates the variation in the interpretation of S, not MR.

For me this differs from the RAP in one important way. I would like to assume that the semantic context of a resultative predicate, such as *qie dun* ‘cut dull,’ is the same as that of a simple predicate of action, such as *qie* ‘cut.’ So if a thematic relation interprets S in a transitive clause with a resultative predicate, it also interprets S in transitive clauses with other predicates. And therefore if Mandarin and Igbo differ in resultative clauses, they should differ this way in all clauses that describe actions. At the moment, however, I have no evidence that this is true. And for this reason I provisionally prefer the RAP, keeping the variation in the meaning of MR.

6 Conclusion

Syntactically, resultatives in Igbo are very like those in Mandarin, with two adjacent verbs followed by O. They also share two notable properties, different from English. First, the interpretation of O is not restricted in relation to M, even when the verb in M is transitive. Second, a resultative predicate MR can occur in an unaccusative clause, even when the M verb is agentive, and so cannot do the same on its own.

Given the common assumption that M contains no more than a verb root, these two facts have a nice account if verbs in Mandarin and Igbo have no arguments lexically. Structure to introduce arguments is then outside of M, where it will relate to the event of MR, not the distinct event of M. In addition, the distribution of these arguments must be stated with respect to MR as a whole, and not the root in M. Consequently, since MR may have features from sources other than M, there is no expectation that the two will occur in the same contexts. MR may be licit in an unaccusative clause when M alone is not. This is obscured in English, since

unaccusative clauses reject all agentive predicates. But it is visible in Mandarin and Igbo, where the unaccusative frame is more permissive. And this challenges the simplest supposition about English (Levin and Rappaport 1995, Williams 2005), that it forbids agentive verbs in intransitive resultatives because such verbs lexically have their agent as an argument.

Igbo also shares with English, despite their structural differences, two features that distinguish both languages from Mandarin. In Igbo, some agentive verbs cannot occur in intransitive resultatives; and in a transitive resultative with agentive M, S always names the agent of the means event. These contrasts come from no difference in the manifest syntax, since there Igbo looks like Mandarin. Instead they might be derived by giving agentive verbs in Igbo and English but not Mandarin their implied agent as an argument. But this, I have argued, precipitates quite unattractive complications. It is better to assume that Igbo and English differ, both from Mandarin and from each other, just in which verbs have a syntactic feature [a] that is illicit in unaccusative frames. And perhaps it is also better to stipulate that the constructional meaning of resultatives is slightly narrower in Igbo and English than in Mandarin, entailing that the agent of a process described by a resultative is also the agent of the stated means event. With this difference in content, the logical form is kept as spare in Igbo as it is in Mandarin—for every transitive resultative, it is exactly (95)—and English differs in no more than one small way. A transitive verb in English has its Theme as an argument, and when the verb is M, this is bound by O, as in (96).

$$(95) \quad \lambda e_1 \exists e_2 \exists e_3 [\text{Agent}(e_1, \llbracket S \rrbracket) \ \& \ \text{Theme}(e_1, \llbracket O \rrbracket) \ \& \ \mathcal{K}(e_1, e_2, e_3) \\ \& \ M(e_2) \ \& \ R(e_3)]$$

$$(96) \quad \lambda e_1 \exists e_2 \exists e_3 [\text{Agent}(e_1, \llbracket S \rrbracket) \ \& \ \text{Theme}(e_1, \llbracket O \rrbracket) \ \& \ \mathcal{K}(e_1, e_2, e_3) \\ \& \ M(e_2) \ \& \ \text{Theme}(e_2, \llbracket O \rrbracket) \ \& \ R(e_3)]$$

This seems an attractively minor deviation from the standard set by Mandarin.

Notes

¹My use of “agent” is very broad (Baker 1997). It is not limited to volitional actors, and sometimes includes participants that might also be called instruments, in a different gloss on the same stretch of history.

²In glosses of Mandarin, PFV means ‘perfective’ and CLS means ‘classifier.’ For both Mandarin and Igbo, I use hyphens only with clitics and affixes. Glosses of Igbo use the following abbreviations. FACT means ‘factative.’ Roughly, a predicate in the factative has past time reference when event and nonpast time reference when stative. BVC means ‘bound verb cognate’ (Nwachukwu 1987, Emenanjo 1987), a nominalization of the verb group. In all the data to be presented here, the BVC serves only to satisfy the requirement that a verb group in the factative not be clause-final (Nwachukwu 1987:19–21). 3s(S) means ‘third person singular (subject) pronoun,’

and PREP means ‘general preposition.’ Igbo ([iɓo]) is a Benue-Congo language spoken mainly in Nigeria.

³If Mo punches Lee, causing Lee to fall, hit his head and black out, we can say that the punch caused the blackout, just as well as we can say that a rainstorm caused a crop failure. But we cannot say that Mo punched Lee unconscious. For this reason it is common to say that resultatives (Bittner 1999), like single verb causatives (Shibatani 1972, McCawley 1976, Talmy 1976, Wolff 2003), imply “direct” causation. But this is more a name than an analysis (Shibatani 2000, Pietroski 2005).

⁴More obviously, the event of MR is not (or need not be) the event described by the head of R, since an event of pounding flat is not a state of flatness.

⁵Of course the event of MR may have a certain property *because* its M event has the same. A pounding flat may be loud because its constituent pounding is loud, just like a child may be blonde because its hair is blonde, or illegitimate because its parents are unmarried. But examples like this do not show that an adverb can modify M, any more than *illegitimate blonde child* shows that *child* covertly contains the words *hair* and *parents*, to be modified by the two adjectives.

⁶“The Theme of [BECOME’s] event is the same as the Theme of its Target state: BECOME(*e, s*) → [Theme(*e, x*) ≡ Theme(*s, x*)].” (Parsons 1990:119)

⁷For speakers of any language, events of cutting or striking involve at least two participants. (32) and (33) say nothing to the contrary. Similarly, to say that $\llbracket bicycle \rrbracket$ is $\lambda x[Bicycle(x)]$ is not to deny bicycles necessarily have two wheels.

⁸For clarity I leave the event of the clause bound by a lambda, to distinguish it from any so-called subevents. Eventually this is bound existentially, however.

⁹Formally, inheritance of an argument requires an operation like Kratzer’s (1996) “Event Identification,” which combines function composition with function conjunction. In turn, identifying an argument of MR with an “outside” relation in its context requires an extension of standard conjunction.

¹⁰There are acceptable unergative uses of *cut*, for example in contexts such as (97), where there is a task under discussion which implies an understood object for the cutting. But this does nothing to change the point.

(97) We had to prepare the appetizers, first cutting and then arranging the various treats. I cut and Lee arranged.

¹¹The transitivity of clauses is formally clear in Igbo. Were *mma ahu* ‘that knife’ to be replaced by a pronoun in (48a), the pronoun would have the subject form, not the object form. Moreover, the DP cannot be analyzed as a fronted object, since that would require an overt pronominal clitic to register the subject.

¹²According to Hale, Ihionu and Manfredi 1995, intransitive resultatives in Igbo are not stative. Were they stative, we could assimilate them to English past participles used predicatively, as in: *The bone is cut*. I believe Hale et al. are correct, since for my consultants intransitive resultatives will accept eventive adverbs, such as *osịisọ* ‘quickly,’ to describe the pace of the MR process.

¹³In Mandarin, fronting of a *wh*-phrases is generally infelicitous, suggesting that strings like (52) allows an intransitive parse. Tan (1991) gives additional arguments for this conclusion, but see and LaPolla 1988 and Li and Thompson 1994 for other views. Certainly there can be no general objection to an intransitive resultative with a transitive verb in M, given the clear data from Igbo.

¹⁴Compare the treatment of examples like *freeze solid* in Levin and Rappaport Hovav 1995.

¹⁵Even this condition does not hold in every language. In St’at’imcets, for example, nearly every verb can occur in an unaccusative context, including verbs of striking, such as *qamt* ‘to hit with a thrown object’ (Davis and Matthewson 2009).

¹⁶Here I use *middle* for a special sort of unaccusative clause, usually modal, with distinctive conditions on its tolerance for otherwise agentive verbs: “The grammatical subject of a middle (if present) must have properties such that it can be understood to be responsible for the action expressed by the predicate” (Ackema and Schoorlemmer 2006). These are not restrictions on the unaccusatives that I discuss here.

¹⁷Each of these MR combinations is acceptable in a transitive clause.

¹⁸Only animals can be the agent of *kpu* ‘brood,’ a transitive verb meaning ‘to crouch over (esp. eggs or infants).’ The collocation *kpu wa* ‘brood split’ is listed in Igwe 1999 (pg. 332). The speakers who judged (64c) all said that *wu* ‘jump’ can only describe the jumping of a creature, and not the bouncing of a ball or pebble.

¹⁹See Bittner 1999 and Rothstein 2004 for relevant discussion.

²⁰Here is an example of what would be possible were derivations like (91) allowed more generally. Kratzer (1996) proposes structures like (98), where DP_p satisfies a lexical argument of *cut*, and DP_a satisfies a lexical argument of **Ag**. With no change to *cut* or **Ag**, the proposal we are considering would also allow the alternative derivation in (99), where the lexical argument of *cut* is not satisfied until after V combines with **Ag**. And this would allow, wrongly, for sentences like (100).

(98) $[_v DP_a [_v Ag [_V DP_p cut]]]$

(99) $[DP_p \dots [_v DP_a [_v Ag cut]]]$

(100) * The bone cut Lee.
‘Lee cut the bone.’

²¹Likewise if the RAP governs English, it explains why (101) is unacceptable, even if English, as I am assuming, has an OR semantics.

(101) * The clumsy reporter fell the Jenga tower apart.
‘The reporter made the Jenga tower come apart from [its] falling.’

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