Patients in Igbo and Mandarin

1 Introduction

The development of event semantics has facilitated discussion of a basic question in verbal grammar. For a given thematic relation between (the meanings of) a verb and a phrase local to it, is that relation introduced by the lexical representation of the verb, or by the structural context in which the verb occurs? Yet the two ways of modeling a thematic relation, as projecting from the verb or as imposed by its context, are often hard to distinguish empirically. In this paper I discuss a case where the facts seem decisive: resultative constructions in Mandarin and Igbo, like (1) and (2) respectively.¹

(1) tâ fî duâin-le náitâio múbân.
   3s kick-snap -PFV that plank
   ‘He made that plank snap by kicking.’

(2) O ku wa-ra o昼夜 auprès.
   3sS strike-splat -FACT gourd that
   ‘He made that gourd split by striking.’

The grammar of these constructions demonstrates that, characteristically in Igbo and Mandarin, neither agents nor patients are arguments of the verb. Basic the-

¹ Mandarin is a Sinitic language and the national language of China. In glosses of Mandarin, PFV means ‘perfective,’ and P&T means ‘sentence-final particle.’ Igbo ([Igbo]) is a Bantu Congo (or Eastern Kwa) language spoken mainly in Nigeria (see Swift et al. 1962, Green and Igwe 1963, Emenejji 1978, and Igwe 1999). Glosses of Igbo use the following abbreviations. FACT means ‘factive’, roughly, a predicate in the factive has past time reference when eventive and nonpast time reference when stative. BVC means ‘bound verb cognate’ (see Nwachukwu 1987 and Emenejji 1978). The BVC is a nominalization of the verb group; in all the data presented here, it is used solely to satisfy the requirement that a verb group in the factive has not be clause-final (Nwachukwu 1987: 19–21). PROG means ‘progressive,’ SBRO means ‘subordinate verb prefix,’ and P means ‘all-purpose preposition.’
matic relations are instead introduced by the structure in which the verb occurs. I have defended this conclusion for agents elsewhere (Williams 2004, 2005). In this paper I make the case for patients, a more surprising hypothesis. Almost always, patients are treated as arguments of the verb, and strong conceptual support has been given for this decision, notably in Kratzer (2003). Here I counter with a grammatical argument. For Igbo and Mandarin, the relative distribution of verbs and patients is best explained if patients are introduced by verb phrase structure, and not by the verb. Based on this I abstract a broader conclusion. If the event of a verb necessarily has a patient as a participant, we still cannot conclude that the verb has a patient as an argument. Lexical meaning is not lexical valence.

The program is as follows. I begin in section 2 by sketching what it means for an argument to be introduced by the verb or by its context. Sections 3 and 4 then define what resultative constructions are, and how they can be used to test for the valence of verbs within them. The lessons of English resultatives are discussed in section 5, before I lay out the target data from Igbo and Mandarin in section 6. Section 7 is the core of the paper, setting out the claim that the facts of section 6 are best explained if patients are not arguments of the verb. Sections 8 and 9 consider and dismiss various alternatives. I then mention a semantic objection to the theory in section 10 before concluding.

2 Projectivist and nonprojectivist models

Suppose that the direct object in a simple clause names the patient of the verb’s event, as in (3). There are two ways to model this, differing in how the relation is introduced in deriving the semantic representation of the clause (see Carlson 1984, Dowty 1989, Kratzer 1996, Borer 2003).

(3) [Al pounced the cutlet] = \exists e. pounced(e) ∧ PAT(e) = c ∧ AG(e) = a

We might say that the patient relation is introduced by the lexical representation of the verb, as in (4) for example. In this case the patient relation projects from the verb, and the patient is a lexical argument of the verb.

(4) [pounced] = \lambda y (\lambda x). pounced(e) ∧ PAT(e) = y (\land AG(e) = x)

Or we might say that the patient relation is not introduced by the verb, but by the structure in which it occurs, perhaps as in (5). Then the patient, while it is identified by an argument category in the clause, is not a lexical argument of the verb.

I will call models of the first type projectivist, and models of the second type nonprojectivist.

The two models differ in how many lexical arguments they assign the verb. But they need not differ in how many participants they assign the event-type that the verb describes. If a verb has an argument to which it assigns a certain thematic relation, then it describes an event involving a participant who bears that relation. But the converse is not necessarily true. Compare (4) and (5a) for example. Given existential closure of y and x in the former, each defines a predicate of events. These two predicates do not necessarily differ in extension. Any event that verifies the predicate from (4) must have a patient; this is stated explicitly in the formula. But the same might be true of (5a), albeit implicitly, if the metalanguage predicate pounced is defined to have (6) as a consequence (see Dowty 1989: 85). In that case (4) and (5a) will describe exactly the same set of events.

(6) Ve[pounced(e) → \exists y. PAT(e) = y]

Thus the choice between projectivist and nonprojectivist models is primarily not semantic, in the strict sense, but grammatical. Given two theories of either sort which assign the verb the same type of event, which one yields the simpler and more explanatory grammar?

It is sometimes suggested that, pursuant to some universal principle, a verb has a lexical argument for each participant in its event (see e.g. Lidz, Gleitman and Gleitman 2003, Kratzer 2003: Chapter 1, page 18). But this is an empirical hypothesis, not an a priori principle. And if my understanding of Igbo and Mandarin is correct, it is a hypothesis challenged by the facts of these languages (see also Davis and Demirdache 2000, Bhatt and Embick 2004).

3 Resultative constructions

Resultative constructions, henceforth RCs, are single clause constructions comprising two predicates, a means predicate (M) and a result predicate (R). Neither M nor R is introduced by a conjunction, adposition, or complementizer. (7) is an English example, where M is pounced and R is flat.

(7) A1 pounced the cutlet flat.

Semantically, RCs express a relation of causation between the eventualities described by M and R, without this relation being indicated by any overt morpheme (Dowty 1979, a.o.): (7) says that pouncing caused flatness. One aspect of this...
meaning is that some object changes state, entering the result condition defined by R. The phrase that names this object, I will say, controls R. In (7) the cutlet controls flat, since (7) entails that the cutlet became flat.

(1) and (2), repeated here, are RCs from Mandarin and Igbo. In (1) M is ti ‘kick,’ R is dà ‘nap,’ and R is controlled by nàtiáo múbùn ‘that plank.’ The sentence says that kicking caused snapping, and what wound up snapped was the plank. (2) says that striking caused splitting, and what wound up split was the gourd. M here is ku ‘strike’ and R is wa ‘split.’

(1) tà tí dà àn le nàtiáo múbùn.
3s kick snap -PP that plank
‘He made that plank snap by kicking.’
(2) O ku wa -ra qíba abu.
3sS strike split -FACT gourd that
‘He made that gourd split by striking.’

My glosses will follow a fixed format: ‘subject made object R by M’ing.’ I will discuss the syntax of Mandarin and Igbo RCs briefly in section 6.

What will interest me primarily are the understood thematic relations of subject and object to the event of M, the means event. In (7) AI names the agent of pounding and the cutlet names its patient. In (1) and (2) as well, the subject is the agent of the M event, and the object is the patient. But we will see in section 6 that Mandarin and Igbo differ from English in not requiring this particular pattern of relations. And this will form the basis of my central conclusion, that verbs are typically without arguments in Igbo and Mandarin.

One last distinction should be made, between what I will call transitive and intransitive RCs. In English the distinction is readily made in terms of surface syntax. Transitive RCs have a subject and an object, (8), while intransitive have only a (surface) subject, (9).

(8) (a) AI pounded the cutlet flat.
     (b) AI yelled his throat hoarse.
(9) (a) The lake froze solid.
     (b) The door swung shut.

But the criterion of the distinction, as I intend it, is semantic. Transitive but not intransitive RCs include an argument that is construed as the agent of causation(i.e. the causer); as it happens, this is always the subject. Concomitantly there is a difference in control of R. Control is by the object in transitives and the (surface) subject in intransitives (Simpson 1983, Y. Li 1995). Classing RCs along these lines assists in cross-linguistic comparison, allowing generalizations to emerge which are otherwise obscured by independent differences in syntax (Williams 2005). In this paper I rely on it only to limit the scope of discussion: I will discuss only transitive RCs.

4 The relevance of resultative constructions

RCs are sometimes analyzed as complex predicates (e.g. Dowty 1979, Larson 1991). It is assumed, that is, that M contains no argument positions. Instead the means verb combines directly with R to the exclusion of the object, (10).

(10) [ Object [Vmeans R ]] (linear order irrelevant)

Insofar as this analysis is correct for a given RC, the construction will provide a diagnostic environment. By putting a verb in M, we stand to learn something about its lexical argument structure. Let us see why.

Suppose we are choosing between two denotations for pound, (11) and (12). The two options make different predictions when pound occurs in M, if the RC is a complex predicate.

(11) [[pound] = λy.λe.pound(e) ∧ PAT(e) = y
(12) [[pound] = λe.pound(e)

Given (11), the verb, when it occurs in M, will have an argument that is not immediately saturated, since there the verb’s sister will be R, an expression that cannot provide a patient. We consequently expect that the complex predicate will inherit this unsaturated argument from M. We expect, for example, that the denotation of pound flat will have the outlines in (13).

(13) [[pound flat] = λy ... pound(e) ∧ PAT(e) = y ...}

So by assigning the argument to the verb lexically, we encode an expectation that the verb will be subject to the same requirement in an RC as in a simple clause. In both contexts it will cooccur with a phrase understood as its patient. Any deviations from this expectation will count as special cases, in need of explanation. For example, we might need to posit a covert object that binds the verb’s unsaturated argument.

We have no such expectation, however, if the patient is not an argument of the verb, (12). Then there will be no argument left unsaturated when M and R combine, and no argument to pass along to the complex predicate. So there will be no assumption, based solely on the verb’s lexical representation, that it will

3 I assume a very broad understanding of the agent relation, similar to what Van Valin and Wilkins 1996 have for their “Effector” relation. I do not assume that agents must be animate or volitional actors.

4 Some of the points I make about the complex predicate analysis can also be made about the Small Clause analysis (Kayne 1985, Hoekstra 1988), according to which RCs have the structure: [ Vmeans [ Object R ] ]. Yet I will not discuss the Small Clause analysis here, as I find it unattractive for the languages under consideration (cf. Sybesma 1999).
enter the same thematic relation in RCs as it does in simple clauses. It will not come as a surprise if no noun phrase in an RC is interpreted as the patient of the means event.

If they are complex predicates, therefore, RCs can provide evidence for whether or not a given thematic relation projects from the verb. If the relation obtains wherever the verb occurs, equally in RCs and simple clauses, then it is likely introduced by the verb itself, lexically. But if it should matter where the verb occurs — with the relation required in simple clauses, but not in RCs — then perhaps it is introduced not by the verb, but by its context.

5 English resultative constructions and verbal valence

Before heading into Igbo and Mandarin, it will be useful to consider English as a counterpoint. We will see that, in English, the grammar of RCs can be used to argue that (at least) patients are arguments of the verb.

In English, a verb is typically subject to the same requirements in an RC as in a simple clause. A verb will require a patient (or theme) when in M, for example, to the same extent, and under the same conditions, that it requires one in a simple clause (Dowty 1979: 222, Carrier and Randall 1992: 187, Levin and Rappaport Hovav 1995: 39, but cf. Boas 2003: 113). The verb yell, for example, does not require identification of its theme (i.e. that which is yelled) in simple clauses, (14), and the same is true in RCs, (15).

(14) Al yelled.
(15) Al yelled his throat hoarse.

The verb hammer generally does occur with an object naming the patient of hammering. But sometimes, particularly when the hammering is repetitive, the patient may go unexpressed, (16). Again, this is true in RCs as in simple clauses; (17) does not tells us what was hammered.

(16) Al hammered ?(nails).
(17) ?Al hammered his wrist sore.

Finally, verbs like cut and carry do not tolerate drop of their patients in simple clauses (18), and the same intolerance is shown in RCs (19). Carrier and Randall (1992: 187) illustrate the same point for the verb frighten, (20).

(18) (a) Al cut *(the frozen meat).
(b) Al carried *(the luggage).
(19) (a) *Al cut the knife dull.
(b) *Al carried his neck sore.
(20) (a) The bears frightened *(the campers).
(b) *The bears frightened the campground empty.

Thus in each case the behavior of the verb in RCs corresponds to its behavior in simple clauses.\(^5\)

The same pattern governs grammatical relations. A verb in M will find its thematic relata bearing the same grammatical relations in the RC clause that they would have in a simple clause. In the simple clauses (21a) and (22a), yell and pound find their agent in the subject and their (theme or) patient in the object; the opposite arrangement is impossible, (21b), (22b).

(21) (a) Al yelled slogans.
(b) *The slogans yelled Al.
(22) (a) Rocky's fists pounded the frozen meat.
(b) *The frozen meat pounded Rocky's fists.

Just so, neither verb can occur in a RC where the object names its agent and the subject names its theme, (23), (24). Notice that the intended meanings here are entirely plausible.

(23) *The slogans yelled Al hoarse.
Intended: 'The slogans made Al hoarse by his yelling them.'
(24) *The frozen meat pounded Rocky's fists bloody.
Intended: 'The meat made the fists bloody by their pounding it.'

When a verb is subject to the same argument requirements in both simple clauses and RCs, I will say that it shows uniform projection. And when it is characteristic of a language that its verbs show uniform projection, I will say that the language has the uniform projection property, or UPP. Thus English has the UPP. Knowledge of this is revealed by our reaction to a quote attributed to Mormon pioneer Brigham Young, (25).

(25) ""'God almighty will give the United States a pill that will put them to death,' Young said during tensions in the late 1850's."
(T. Egan, New York Times, 3 February 2002)

From this unusual sentence we deduce immediately that Young's grammar must have allowed sentences like (26). Were the UPP not a characteristic of English, the strength of this inference would be surprising.

(26) This bitter pill will surely pube you.

Uniform projection is explained if argument requirements are stated as lexical properties of the verb, since they will then be expressed wherever the verb occurs. English RCs have therefore been take to support a projectionist model

\(^5\) Essentially the same pattern is found with respect to agent arguments. A verb will require or refuse an agent to the same degree in M as in simple clauses.
of argument relations, most emphatically in Levin and Rappaport Hovav 1995 (chapter 2). 6

6 Arguments in Igbo and Mandarin

In this section we will see that Igbo and Mandarin do not have the UPP. Systematically, verbs that must cooccur with a patient in simple clause have no such requirement in RCs.

First let us get a clearer idea of the basic structure of RCs in these languages, which differs somewhat from that of the RC in English. In English, M is a verb but R never is. In Igbo and Mandarin, however, M and R are both verbs, roots that can serve as the sole predicate of a clause without auxiliary support. Thus the R predicates in (27) and (29) can head clauses on their own, (28) and (30). Notice that the R verb is moreover not constrained to be stative; in both these examples, it is eventive.

(27) t`i du`an -le n`tia`o mubbn.
   3s kick snap -PFV that plank
   'He made that plank snap by kicking.'

(28) n`tia`o mubbn du`an -le.
    that plank snap -PFV
    'That plank snapped.'

(29) G`ku wa -ra g`ba ah`u.
    3sS strike split -FACT gourd that
    'He made that gourd split by striking.'

(30) G`ba ah`u wa -ra awa.
    gourd that split -FACT BVC
    'That gourd split.'

In English, R is phrasal, in that it may contain modifiers in addition to its head, (31). But the head of R cannot be modified in Igbo and Mandarin, as shown for Mandarin in (32). Thus R is a verbal head simply, and not a phrase.

(31) Al pounded the cutlet very flat.
(32) t`a z`a (*b`en) ping -le n`ku`u r`ou.
    3s pound (*very) flat -PFV that meat
    'He pounded that meat (*very) flat.'

Tense and aspect suffixes follow both verbs in Igbo and Mandarin, and do not attach to M independently. The direct object likewise follows both M and R, and

cannot occur between them, (33), (34).

(33) *t`a ti (-le) n`tia`o mubbn du`an (-le).
    3s kick (-PFV) that plank snap (-PFV)
    Intended: 'He made that plank snap by kicking.'

(34) G`oku (-ru) g`ba ah`u wa -ra).
    3sS strike (-FACT) gourd that split (-FACT)
    Intended: 'He made that gourd split by striking.'

Mainly because M and R are in this way inseparable, it is widely agreed that Mandarin and Igbo RCs are complex predicates. The means verb combines directly with R, and does not combine first with any noun phrase arguments (see e.g. Thompson 1973, Y.Li 1990, and Huang 1992 for Mandarin; Lord 1975 and Hale, Ihio, and Manfredi 1995 for Igbo). I will assume that, more specifically, the first node dominating both M and R is α as in (35a), with an intermediate head introducing the relation of causation between events. 7 Details of the semantic derivation will be proposed in section 7; but in outline it will proceed as in (35b).

(35) (a)

(b) [α] = [CAUSE]][[VR]][[VM]]

6.1 Unrealized patients

In both Mandarin and Igbo, a verb that must cooccur with a patient in simple clauses need not do so when serving as M in an RC.

For Mandarin this observation is commonplace (L. Li 1980, Lü 1986, Ma 1987, Tan 1991, among others). Take the verb qiē ‘cut,’ for example. In simple clauses, (36), it requires an object naming the patient of cutting. Thus sentences like (36b) or (36c) can only be analyzed as including a silent object pronoun, referring to some individual salient in the discourse. They cannot mean simply that there was an event of Lao Wei cutting something, or that there is such an event ongoing.

(36) (a) L`o`W`ei qiē -le zhui`sun.
    L.W. cut -PFV bamboo shoot
    'Lao Wei cut bamboo shoots.'

7 I have no strong objection to an alternative structure where the node α contains just the two verbs, and the relation of causation is introduced by semantic rule. But there is some slight morphological evidence for the presence of the head in Mandarin.

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6 We should appreciate that Levin and Rappaport Hovav’s conclusion is persuasive only if English RCs are complex predicates. If instead the means verb combines immediately with the object NP, as argued by Carrier and Randall (1992), then the local syntactic context of the verb will be the equivalent in RCs and in simple clauses. And in that case we would expect the UPP pattern whether the arguments project from the verb or not.
Finally we cannot say that the direct object in (37), câidâo 'cleaver,' is itself an argument of the means verb. The cleaver is indeed the instrument of the means event; but in simple clauses qiē 'cut' cannot take an instrument as its direct object, (41).

(41) *tâ qiē -le nîde câidâo.
3s cut -LE your cleaver
Intended: 'He cut with your cleaver.'

This pattern is systematic. With few exceptions, any verb in M can occur without the patient argument required in simple clauses. (42)–(44) give further examples.

(42) wô cā zâng -le liângkwoâi móâo.  
1s wipe dirty -PPFY two towels
'I made two towels dirty by wiping.'

(43) tâ pîi têng -le shōu.  
3s smack hurt -PPFY hand
Can mean: 'He made his hand hurt by smacking [something else].'
(Adapted from L. Li 1980: 98, trans. AW)

(44) tâ mîi -ông -le qianbâo.  
3s buy -empty -PPFY wallet
'He bought (so much that) his wallet (got) empty.'
(ex. and trans. Tan 1991: 100)

It can be shown, just as it was for (37), that none of these RCs includes a noun phrase naming the patient (or theme) of the means event; yet in each case M is a verb that must cooccur with a patient (or theme) argument in simple clauses, and cannot take an instrument as its direct object.

Igbo displays the same pattern as Mandarin, just as systematically. A verb required to cooccur with a patient in simple clauses is subject to no such requirement when in M. Take the Igbo verbs bi ‘cut’ and gwu ‘dig out,’ for example. In simple clauses like (45) and (46), these verbs must cooccur with an argument noun phrase that identifies what was cut or what was dug out.

(45) O bi -ri osisi.  
3sS cut -FACT wood
'He cut wood.'

8 Such VPs are considered adjuncts not only because they can be dropped, but also because they cannot include aspectual suffixes or modal verbs.
9 The Igbo data I present here come mainly from primary research I conducted with native speakers from Nigeria, now living in the Philadelphia area. More information on Igbo RCs can be found in Lord 1975; Nwachukwu 1987; Uwalaka 1988; Déchaîne 1993; Haile, Ihimma, and Manfredi 1995; and Igwe 1999.
O gwu -ru jì.
3sS dig -FACT yam
‘He dug up yams.’

Unlike Mandarin, Igbo has no silent object pronouns; so (47) and (48) have no grammatical analysis at all.

(47) (a) *O bi -ri (ebi).
3sS cut -FACT (BVC)
Intended: ‘He cut [stuff].’
(b) *O na e- bi (ebi).
3sS PROG SBRD- cut (BVC)
Intended: ‘He is cutting [stuff].’

(48) (a) *O gwu -ru (egwu).
3sS dig -FACT (BVC)
Intended: ‘He dug up [stuff].’
(b) *O na e- gwu (egwu).
3sS PROG SBRD- dig (BVC)
Intended: ‘He is digging up [stuff].’

Yet when bi ‘cut’ and gwu ‘dig out’ appear in M, there is no need for a patient. (49) and (50) are perfectly natural, despite the absence of any noun phrase identifying what was cut or what was dug out.

(49) O bi -kpu -ru mma.
3sS cut -blunt -FACT knife
‘He made his knife blunt by cutting [stuff].’
(50) O gwu -ji -ri oggu.
3sS dig.up -snap -FACT hoe
‘He made the hoe snap by digging up [stuff].’

Again, these are not cases of silent anaphora, since Igbo has no silent object pronouns. Nor do they express alternative argument structures for bi ‘cut’ and gwu ‘dig up’, alternatives which select an instrument rather than a patient as object. In simple clauses an instrumental object is impossible, (51), (52).

(51) *O bi -ri mma (n’ osisi).
3sS cut -FACT knife (P wood)
Intended: ‘He cut with a knife (at wood).’
(52) *O gwu -ru ogu (na ji).
3sS dig.up -RV hoe (P yam)
Intended: ‘He dug with his hoe (at yams).’

We can only conclude that the requirement associated with these verbs in simple clauses is absent in RCSs. Should the speaker want to identify the patient of the means event, this can be done by means of an adjunct PP, as in (53) and (54).

(53) O bi -kpu -ru mma n’ osisi.
3sS cut -blunt -FACT knife P wood
‘He made his knife blunt cutting wood.’
(54) O gwu -ji -ri oggu na ji.
3sS dig.up -snap -FACT hoe P yam
‘He made the hoe snap digging up yams.’

But the addition of this information is not syntactically required.

The behavior of bi ‘cut’ and gwu ‘dig out’ is in no way exceptional. Verbs that require a patient in simple clauses do not when in M, quite generally. Three more examples are given in (55)–(57).

(55) O sọ -ja -ra osisi.
3sS poke -splayed -FACT wood
‘He played the stick by poking [with it].’
(Can also mean: ‘He played the stick by poking it.’)
(56) O de -ji -ri pensal.
3sS write -snap -FACT pencil
‘She made the pencil (nib) snap by writing.’
(57) O bu -bo -ro olu (n’ ihe).
3sS carry -sore -FACT neck (P load)
‘She made her neck sore by carrying (a load).’

In none of these RCSs is there a noun phrase identifying the patient of the means event. Yet sọ ‘poke’, de ‘write’, and bu ‘carry (on the head)’ are all verbs that require a patient in simple clauses, and cannot take an instrument as object.

6.2 Patients in unexpected places

The suspension of simple-clause requirements is also evident in the correspondence between thematic and grammatical relations. A verb constrained to find its patient in the direct object of a simple clause may seem to find a patient in the subject of an RC.

For Mandarin this has been observed in L. Li (1980), Liu (1986), Ma (1987), Tan (1991), and elsewhere; the most widely known discussions are in Y. Li (1990 and 1995). Consider (58) and (59) for example.

(58) (a) jiéjié xì -le yiřū.
clothes wash -PFV clothes
‘Big sister washed the clothes.’
(b) *yiřū xì -le jiéjié.
clothes wash -PFV elder.sister
Intended: ‘Big sister washed the clothes.’
(59) yifū xi lài -le jiējiē.  
   clothes wash tired -PFV elder.sister  
   ‘The clothes made big sister tired from [her] washing [them].’  
   (ex. Ren 2001: 326, trans. AW)

In simple clauses, (58), the verb xī ‘wash’ is constrained to find its patient in the object and its agent in the subject. Yet in the RC (59), the subject is understood as naming the patient of the means event, and the object, its agent: big sister washes the clothes. So constraints on the correspondence between grammatical and thematic relations in simple clauses are apparently voided when the verb is in M.

Tan (1991) suggests that sentences like these reflect the possibility of the verb in M occurring intransitively and nonagentively, as in (60).10

(60) yifū xi -le.  
   clothes wash -PFV  
   ‘The clothes are washed.’

She then proposes that, in RCs like (59), the means verb occurs in its intransitive guise, and consequently assigns its patient role to the subject. But this cannot be correct. Conceived as nonagentive intransitives, sentences like (60) have a result-state interpretation. (60) means that the clothes are in the state that results from washing, for example. Yet this meaning is no part of (59). (59) does not mean: ‘The clothes being in a washed state made big sister tired.’ It means rather that washing the clothes made her tired. The contribution of the means verb here is eventive, and not (result-) stative. Thus we should assume that the verb in (59) is the eventive transitive of (58) and not the result-state intransitive of (60).

Now let us turn to Igbo. My interviews with Igbo speakers have hinted that sentences like Mandarin (59) are possible in Igbo as well: transitive RCs where the subject is the patient of the means event while also being the agent of causation. Of the four speakers I consulted with most regularly, two accepted (61) and two rejected it.

(61) Gwụ ahu ụmụ nyụ ya.  
   yam that dig.out -snap -FACT hoe 3SPOSS  
   ‘That yam snapped his hoe by digging [it] out’

For those who accept this sentence, the subject, ji ahu ‘that yam,’ is understood as the patient of the means event: the yam is what was dug out. In simple clauses, however, gwụ ‘dig out’ must find its patient in the object, (62).11

10 Tan demonstrates that sentences like (60) do indeed have an intransitive analysis, under which there is no silent pronoun referring to an agent, and the patient NP is the (surface) subject. This conclusion accords with the consensus in the Chinese-language literature (e.g. Gong 1980), and with the perspective in Li and Thompson (1994); but see LaPolla (1988) for disagreement.

11 One of the speakers who accepted (61) also accepted (i). This sentence could not be tested with my other consultants, however, as their dialects do not include the verb do ‘tired, sore’ (Green and Igwe 1963: 232, Igwe 1999: 559).

(i) Ssụ bu ọ hụ -ho -ro ya olu.  
   load carry -sore -FACT 3s neck  
   ‘The load made his neck sore from carrying.’

Here M is bu ‘to carry on the head’, and the subject names what is carried. But this is impossible when bu is on its own, (ii).

(ii) *sụ bu bu -ra ya.  
   load carry -FACT 3s  
   Intended: ‘He carried the load.’

The speaker who accepted (ii) grew up in the Isu-ikwu-ato region of an area now known as Ambiyia, formerly a part of Imo State. The dialect studied in Green and Igwe (1963) was spoken “near Umushia by the people known as Ogbuu” (1963: xii).

12 It is also true that certain non-semantic requirements shown in simple clauses may be suspended when a verb is in M. Verbs that are required to cooccur with a certain semanticallyvacuous object noun phrase in simple clauses are under no such obligation when in M. This is a major topic in the two seminal papers from which the present work derives, Thompson (1973) and Lord (1975).

Yet I lack the space to discuss it here.

6.3 Summary of the data

The thematic relations an Igbo or Mandarin verb must enter in simple clauses, it need not enter when in the means predicate of an RC.12 Correspondingly, while the interpretation of subject and object is fixed with respect to the verb in a simple clause, it is largely free with respect the means verb in an RC.

At the same time, two correlated aspects of interpretation remain fixed. The subject names the agent of the event of causation, and the object names the thing caused to enter the result state defined by R. Unlike thematic relations to the means event, these relations to the event of causation are never reversed (Y. Li 1995). The understood causer, for example, is never named by the object. And while it may happen that the sentence has no noun phrase naming the patient
of the means event, the ‘causae’ in the event of causation is always identified, namely by the phrase that controls R.

A theory of Igbo and Mandarin must therefore answer three questions. Why does the observed degree of freedom in interpretation obtain only in RCs? Why is interpretation in RCs free only with respect to the means event? And how are Igbo and Mandarin different from English? I believe the only explanatory answers to these questions are provided by the theory I will now describe, the No Argument Theory for Igbo and Mandarin, or NAT.

7 The No Argument Theory

The facts of section 6 follow directly if we assume that patients, as well as agents, are not arguments of the verb in Igbo and Mandarin. The typical transitive verb in these languages characteristically has no arguments lexically; it simply denotes a sortal on events, as illustrated in (64) for verbs meaning ‘cut.’

(64) Mandarin ‘cut’: \[ q\text{i}\text{ê} \] = \( \lambda e.\text{cut}(e) \)

Igbo ‘cut’: \[ b\text{ê} \] = \( \lambda e.\text{cut}(e) \)

Correspondingly, thematic relations are introduced by the environment the verb occurs in. Krtzer’s (1996) proposal for introducing agents structurally is familiar and I will adopt it here. (65) sketches the proposal by pairing syntactic nodes with their interpretation. A \( v \) head denoting the agent relation combines with VP, and the resulting \( u \) is interpreted by a rule known as “event identification.”

\[
\lambda x.\exists e\left[\text{VP}(e) \land [v](e)(e)\right] \\
\lambda y\lambda e.1.\text{AG}(e_1) = y
\]

\[ u \]

\[ \text{VP} \]

I add that, in Igbo and Mandarin, patient relations are also introduced structurally. This is done, I will assume, by means of a semantic rule that applies at VP, as in (66).

\[
\lambda e.[V](e) \land \text{PAT}(e) = [DP] \\
\text{DP} \land [v]
\]

(66) Others might prefer to posit a head that denotes the patient relation, combining this with the verb by event identification, just as in the case of agents.

For a simple clause whose verb is Mandarin \( q\text{i}\text{ê} \) ‘cut’ or Igbo \( b\text{ê} \) ‘cut,’ (66) yields (67a) as the denotation for VP. Plugging this into (65) then yields (67b) for \( u \).

(67) (a) \[
[\text{VP DP } q\text{i}\text{ê}] = [\text{VP DP } b\text{ê}] = \\
\lambda e.\text{cut}(e) \land \text{PAT}(e) = [DP]
\]

(b) \[
[\text{VP } y AG [v'] \text{ DP } q\text{i}\text{ê}] = [\text{VP } y AG [v'] \text{ DP } b\text{ê}] = \\
\lambda e.\lambda e.\text{cut}(e) \land \text{PAT}(e) = [DP] \land \text{AG}(e) = y
\]

(67b) states directly that the object DP is the patient of pounding, and the subject, when it comes along, will be its agent. The grammar thus predicts correctly that the interpretation of subject and object in simple clauses will be fixed.

But crucially, the same grammar yields a vague interpretation for subject and object in a RC, given two ordinary assumptions: the M verb and R constitute a complex predicate, and this predicate has the distribution of a simple verb.

If the M verb forms a complex predicate with R, it does not combine first with an object. In the present context, this means it does not first enter any structure that introduces a patient. Moreover, the minimal assumption about the semantics of combining M and R is that it introduces no content beyond the relation of causation. The smallest constituent containing both M and R, then, has the interpretation in (68). I assume, recall, that the CAUSE relation here is introduced by a silent head, CAUSE, located between the two verbs; this head can be taken to denote as in (69).

(68) \[
[\text{MR}] = \lambda e.\exists e_1 \exists e_2 \text{CAUSE} (e, e_1, e_2) \land [M](e_1) \land [R](e_2)
\]

(69) \[
[\text{CAUSE}] = \lambda R \lambda M \lambda e.\exists e_1 \exists e_2 \text{CAUSE} (e, e_1, e_2) \land M(e_1) \land R(e_2)
\]

Given the lexical denotations in (70a), therefore, the complex predicates \( q\text{i}\text{ê } d\text{în} \) ‘cut dull’ and \( b\text{ê } k\text{în} \) ‘cut dull’ will denote as in (70b).

(70) (a) \[
[d\text{în}] = [k\text{în}] = \lambda e.\text{dull}(e)
\]

(b) \[
[q\text{i}\text{ê } d\text{în}] = [b\text{ê } k\text{în}] = \lambda e.\exists e_1 \exists e_2 \text{CAUSE} (e, e_1, e_2) \\
\land \text{cut}(e_1) \land \text{dull}(e_2)
\]

(68) is similar to Rothstein’s rule of “resultative conjunction,” (i)

\[ \text{Resultative conjunction (Rothstein 2001: 158)} \\
A + B = \lambda y.\lambda e.\exists e_1 \exists e_2 (e = e_1 \cup e_2) \land (\text{CUL}(e_1) \subseteq e_2) \land A(e_1, y) \land B(e_2, y)
\]

(i) presupposes an analysis of what (68) has as “CAUSE” into a sequence of two relations, namely the first two conjuncts in the body of the formula. But we are free to interpret this analysis into (68).

The only real difference between (68) and (i) is that (i) identifies the presumed internal arguments of M and R by lambda-abstraction, while (68) includes no such operation, since it combines verbs that have no internal arguments. If this difference is factored out, (68) and (i) can be seen as equivalent.
The RC predicate thus denotes a predicate true of events e wherein one event e₁ causes another e₂ — but it specifies no thematic relations to the means or result events individually.

Now let us assume that the minimal RC predicate has the same syntactic distribution as a simple verb. This assumption is common in the literature, where Igbo and Mandarin RCs are often described as compound verbs. Here it means that complex predicates like qiè dün ‘cut dull’ and bi kpu ‘cut dull’ will occur in the V slot of the VP structure in (66), yielding (71). Plugging this into the υ structure of (65) yields (72) in turn.

\[
\begin{align*}
(71) & \quad \left[ \left[ \text{VP DP} [\nu \text{qiè dün}] \right] \right] = \left[ \left[ \text{VP DP} [\nu \text{bi kpu}] \right] \right] = \\
& \quad \lambda e. \exists e_1 \exists e_2 \left[ \text{CAUSE}^e(e, e_1, e_2) \land \text{cut}(e_1) \land \text{dull}(e_2) \land \text{PAT}(e) = \text{DP} \right]
\end{align*}
\]

\[
\begin{align*}
(72) & \quad \left[ \left[ \text{VP DP} [\nu \text{qiè dün}] \right] \right] = \left[ \left[ \text{VP DP} [\nu \text{bi kpu}] \right] \right] = \\
& \quad \lambda x \lambda e. \text{CAUSE}^e(e, e_1, e_2) \land \text{cut}(e_1) \land \text{dull}(e_2) \land \text{PAT}(e) = \text{DP} \land \text{AG}(e) = x
\end{align*}
\]

The VP and υ structures introduce thematic relations. But as a matter of locality, these relations predicate of the main event of causation, and not of its subevents of means and result. The semantics thus tells us that the subject is the agent of causation and the object is its patient, but says nothing explicit about their relations to either the means or the result events. Interpretation with respect to these events is consequently free — except insofar as it is constrained, semantically and pragmatically, by being the agent and patient of a certain event of causation.

This predicted degree of vagueness is exactly what the Mandarin and Igbo data show, I suggest.\(^{16}\) The subject and object of a RC may be construed as bearing any plausible thematic relation to the means event, or no relation at all, because the semantic representation insists on none in particular.

Construal with respect to the result event, on the other hand, is limited by the one semantic constraint that seems natural. Any definition of the basic predicates PAT and CAUSE’ should have (73) as a theorem.

\[
(73) \quad \text{If } x \text{ is the patient of } e_m \text{ causing } e_r, \text{ then } x \text{ is the patient of } e_r. \quad \text{(*)}
\]

So if a plank is the patient of kicking causing snapping, then the plank is the patient of snapping, and hence winds up snapped. This is simply what it means to be the patient of an event of causation. Parsons makes essentially the same claim for his “Themes” of “BECOME” events — which, after all, can be regarded

\[\text{as events of causation with no means event or agent specified (Dowty 1979, Parsons 1990): "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).}

Given this semantics, it follows definitionally that the direct object in an RC, because it necessarily names the patient of the CAUSE’ event, also controls the result predicate R. Take (74), for example.

\[
\begin{align*}
(74) & \quad \text{(a) Lào Wàng tī duān } \cdot \text{le nàtiáo miăn.} \\
& \quad \text{L.W. kick snap-PPV that plank}
\end{align*}
\]

Here the object controls R, but not because the denotation in (74b) states any relation between the plank and the snapping. Rather, it establishes a patient relation between the plank and the event of kicking causing snapping. The relation to the snapping event, in virtue of which we say that the direct object controls R, is a definitional consequence.

Evidently the meaning of CAUSE’ does not entail identity between the agent or patient of causation and any particular participant in the means event. But there do seem to be default inferences; strongest among them, the inference that the agent of causation is in general the agent of the means event. Apparent variation in the strength of this inference cross-linguistically is discussed in Williams (2005).

8 Attractors and alternatives

Two aspects of the NAT are attractive. First, it relies on no special valence-reducing operations, posited ad hoc in the RC context, without morphological motivation. The account derives just from defining the lexical primitives, and observing that RCs are complex predicates, at least in Mandarin and Igbo.

Second, it implies a natural point of cross-linguistic difference. We can assume that Igbo and Mandarin differ from English just in the valence of verbs which describe the same sort of event, (75). In English the patient is an argument of the verb, and consequently English shows uniform projection (see sections 4 and 5).

\[
\begin{align*}
(75) & \quad \text{(a) Mandarin 'cut': } [\text{qiè}] = \lambda e. \text{cut}(e) \\
& \quad \text{(b) Igbo 'cut': } [\text{bi}] = \lambda e. \text{cut}(e) \\
& \quad \text{(c) English 'cut': } [\text{cut}] = \lambda x \ldots \lambda e. \text{cut}(e) \land \text{PAT}(e) = x \ldots
\end{align*}
\]

That verbs with similar meaning may differ in apparent valence is a familiar observation. Discuss and argue describe very similar activities, but only discuss

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\(^{16}\) Sybesma (1999) has similarly suggested that vagueness is what is behind the facts of Mandarin, though his analysis of the RC is otherwise different.

\(^{17}\) In case eᵢᵠ is a state, rather than an event of state change, we will have to consider the patient of a state as its holder. If this is unacceptable, we can simply rewrite (73) less gracefully as (i).

(i) If x is the patient of eᵢᵠ causing eᵱ, then x is the holder of the result state in eᵱ.
requires a direct object to identify the topic of conversation. What the NAT asks us to assume is just that languages may exhibit characteristic differences in how many arguments they assign to a verb lexically, within the range allowed by the number of participants in its event. 18 This seems a plausible assumption.

Now let us consider alternative accounts. How might one model the Mandarin and Igbo data while assuming, contra the NAT, that (at least) patients are arguments of the verb? I see three clear possibilities, but I think they all fail as explanations.

First, we could say that each verb has multiple lexical argument structures, but most are permitted only in the M context. Perhaps xi 'wash' has several lexical entries, for example, corresponding to the several denotations in (76), but only the entry with denotation (a) occurs freely. The others are constrained to occur only in M.

(76) \[ xi \] =

(a) \( \lambda y \lambda x \lambda e. \text{wash}(e) \land \text{PAT}(e) = y \land \text{AG}(e) = x \)

(b) \( \lambda x \lambda e. \text{wash}(e) \land \text{AG}(e) = x \)

(c) \( \lambda e. \text{wash}(e) \)

(d) \( \lambda x \lambda y \lambda e. \text{wash}(e) \land \text{PAT}(e) = y \land \text{AG}(e) = x \)

Second, we might keep lexical verbs unambiguous, granting them only those argument structures that are manifest in simple clauses, and locate ambiguity in the complex predicate instead. The same pair of unambiguous verbs in M and R, that is, might yield a complex predicate with several distinct argument structures, (77). These differ in the thematic relations they establish between the means event and the subject or object referents.

(77) \[ xi \text{let} \] =

(a) \( \lambda y \lambda x \lambda e. \text{CAUSE}'(e, e_1, e_2) \land (\text{wash}(e_1) \land \text{PAT}(e_1) = y \land \text{AG}(e_1) = x) \land (\text{tired}(e_2) \land \text{PAT}(e_2) = y) \)

(b) \( \lambda y \lambda x \lambda e. \text{CAUSE}'(e, e_1, e_2) \land (\text{wash}(e_1) \land \text{AG}(e_1) = x) \land (\text{tired}(e_2) \land \text{PAT}(e_2) = y) \)

(c) \( \lambda y \lambda x \lambda e. \text{CAUSE}'(e, e_1, e_2) \land (\text{wash}(e_1) \land \text{PAT}(e_1) = x) \land \text{AG}(e_1) = y \land (\text{tired}(e_2) \land \text{PAT}(e_2) = y) \)

The operation of resultative predicate formation would then not define a function. More specifically, it would have the effect of arbitrarily permuting or deleting the lexical arguments of the means verb. A version of this solution was developed by Y. Li (1990, 1995).

Finally, formation of an RC predicate might suppress the lexical arguments of the verb in M, through deletion or existential binding. The scheme for interpret-
9 Size does not matter

English allows R to be phrasal, but Igbo and Mandarin do not. For this reason Igbo and Mandarin RCs are often described as compounds, and sometimes as compounds formed ‘in the lexicon.’ If we needed to claim that the M context of Mandarin and Igbo has special effects on argument structure, this difference in syntax might seem to promise an explanation of why. But in fact it could provide no explanation, for three reasons.19

First, there is no a priori reason that combining two lexical heads, whether in the lexicon or in the syntax, should cause the argument structures of either one to be modified or suppressed. Any such effect would have to be stipulated specially, and on no clear basis.

Second, the required stipulation would conflict with many studies of compounds, which have found it useful to assume that, if a verb has argument structure, it is preserved under compounding. The interpretation of compounds like English god-fearing, for instance, has often been explained by assuming that the root verb (here, fear) maintains its argument structure, and assigns the noun its internal thematic role (see Grimshaw 1990).

Third and most importantly, there is direct evidence from Mandarin that the size of R is not what matters. What accounts for the lack of uniform projection is the formation of a complex predicate, regardless of whether its secondary predicate is a head or a phrase. The evidence comes from another complex predicate type in Mandarin, called the V-de construction.

The V-de construction consists of a verb, transitive or intransitive, bearing the enclitic -de, followed possibly by a noun phrase (NP₀) and necessarily by a verb phrase (VP₂), (79). VP₂ is controlled by NP₀ when present, and otherwise by the nearest NP outside VP₁.

(79) V-de construction: \[ VP₁, V-de (NP₀) VP₂ \]

There are two or three subtypes of V-de construction, differing in what semantic relation holds between the meanings of V and VP₂ (Huang 1988, Lamarre 2001, Yue 2001). In one the meaning is roughly causative, and here glossing -de as ‘such that’ yields an appropriate paraphrase.

(80) tā hán -de wǒmén dōu liào xià le yānlèi.
3s scream -DE we all fall -PFV tear
‘He screamed such that we all shed tears.’
(ex. L. Li 1963: 405, trans. AW)

Two major studies of the V-de construction are L. Li (1963) and Huang (1992).

Both conclude that V and VP₂ form a complex predicate to the exclusion of NP₀. V combines first with VP₂ and then the result combines with NP₀.20 Underlyingly, therefore, the V-de construction is isomorphic to the verb-verb RC. Both are complex predicates; they differ just in the size of their secondary predicates.

The NAT therefore predicts that, in V-de constructions as in RCs, a verb will not be subject to the cooccurrence requirements it is subject to in simple clauses. And this is correct. Compare (81) and (82). In the simple clause (81), kuǎ ‘praise’ must cooccur with a patient, but in the V-de construction (82), it need not.

(81) *wò kuǎ -le.
1s praise -PFV
Intended: ‘I praised.’ (Can mean: ‘I praised him/her.’)
(82) wò pái Lào Wéi -de mǎi, kuǎ -dé lián ta tātái yě bùhāoyí.
1s smack Lao Wei’s horse-rump, praise -DE even his wife also embarrassed le.
PRT
‘Flattering Lao Wei, I praised [him] such that even his wife got embarrassed.’

(82) cannot be analyzed as containing a silent pronoun, serving as the object of kuǎ and referring to the understood recipient of praise. Syntactically there is no space for such a pronoun, either before the verb or after, (83).

(83) *wò pái Lào Wéi -de mǎi, (tā) kuǎ (tā) -dé (tā) lián tā tātái 1s smack L.W.’s horse rump, (him) praise (him) -DE (him) even his wife yě bùhāoyí le.
also embarrassed PRT
Intended: Same meaning as (82).

We also find that, again, notional thematic relata may be found in unusual syntactic positions, as in (84).

(84) wǎndòu chī -dé rèn tū fī ruǎn.
peas eat -DE people legs go soft
‘Peas make people go weak in the knees from eating them.’
(L. Li 1963:405, quoting Liu Ke)

Here the understood patient of eating, wǎndòu ‘peas,’ is the subject of the clause, and the understood agent is the object, rèn ‘people’. This arrangement is not possible in simple clauses, (85).

---

19 Most likely the size of R does explain a regular difference in word order. Among SVO languages with RCs, those that constrain R to be a head place the direct object after both M and R (Sbj M R Obj), while the others have the object interceding (Sbj M Obj R); see Williams (2005).

20 For Huang (1992) the surface discontinuity of the predicate is an effect of verb-raising, which here applies to V alone. Huang also regards what I label VP₂ as a clause whose subject is a silent anaphor, controlled by the nearest noun phrase.
One can plausibly object that wǎndōu ‘peas’ in (84) is a topic, whose thematic relation to chī ‘eat’ is only inferred and not assigned grammatically. But in that case chī enters no patient relation in (84), and this is itself significant, since in simple clauses the patient relation is required, (86).

(86) *Lǎo Wěi chī -le.
     L.W.    eat -FFV
     Intended: ‘Lao Wei ate.’ (Can mean: ‘Lao Wei ate it.’)

The fact that Mandarin verbs seem to lose their arguments in verb-verb RCs is thus part of a larger pattern. Their arguments seem to get lost in any complex predicate, whether its secondary predicate is a single verb or a phrase. One cannot use the size of R to explain the lack of uniform projection in Mandarin, therefore, without missing a major generalization.

Given this, I will assume that the size of R cannot explain why Igbo verbs do not show uniform projection either, or why English verbs do. This seems to be the null hypothesis.

10 Might patients be a vice?

There is much doubt about the semantic legitimacy of a generalized patient (or theme) relation. More so than agents, the presumed patients of distinct event-types share few distinguishing properties (Parsons 1990, Dowty 1991). As Kratzer (2003) observes, we generally cannot recognize the patient of an event except under a particular description of the event imposed by the verb. Thus it is unclear whether a highly general patient predicate could be given truth conditions of any substance. Correspondingly, if there is such a predicate, it will surely require that events are individuated to a very fine grain – fine enough that each event will, so to speak, wear its patient on its sleeve (cp. Parsons 1990 and Landman 2000 on agents). Yet such finegrainedness tends to undermine a motivating ambition in semantic theory, that of relating language to a denotational domain of significantly independent structure. For this reason, the idea of a basic predicate that denotes a generalized patient relation is often considered suspect.

With this paper I mean only to cast an opposing doubt, based on the distributional facts of Igbo and Mandarin. In these languages patient arguments seem to be introduced syntactically, and not only in a small group of special cases. If introducing an argument syntactically means introducing a thematic predicate into the semantic derivation (as is commonly but not always assumed\(^{21}\)) then the grammars of Igbo and Mandarin do include patient as a basic predicate. And if this is correct, then perhaps our semantic ambition should be moderated.\(^{22}\)

11 Conclusion

The grammar of resutitutives in Igbo and Mandarin is explained directly if patients in these languages are not lexical arguments of the verb. The explanation is attractive because it does not require any special operations on argument structure that apply in Mandarin and Igbo only. There is no independent indication that such operations do apply, and if they were to be postulated, it would be hard to say why they don’t apply in English resutitutives as well. By adopting the No Argument Theory, therefore, we afford ourselves an account of resutitutive structure that is cross-linguistically more uniform. The source of the observed variation is relocated to the lexicon; or, more precisely, to differences in whether a certain argument type is introduced by the verb or by the structure it occurs in.

These conclusions imply two claims of general relevance. First, we need to distinguish between what sort of event a verb describes, and what combinatorial requirements are associated with the verb lexically. A verb need not have as many lexical arguments as its event has thematic participants. The idea that it should has guided much research, both grammatical and psycholinguistic. But if I am right, there is empirical evidence against it. Second, we need to include patient in the inventory of basic thematic predicates, despite semantic arguments to the contrary.

References


\(^{21}\) For Rothstein (2001), syntactic introduction of an argument does not mean introducing a thematic relation. It just means abstracting over a designated variable in a structured denotation. If this view were preferred – and if the NAT could be implemented in its terms without formal difficulty (which is not perfectly clear) – then it might be possible to state the NAT without making any reference to a patient relation. I lack the space to discuss this possibility here.

\(^{22}\) With Landman (2000), we might accept that a denotational domain of fine-grained events is linguistically necessary, but proceed to relate this domain to one of coarser-grained "situations," by construing events as properties of situations.


