

On Multiple Resultatives: Implications for the Unique Path Constraint*

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Resultatives: New approaches and renewed perspectives
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1 Introduction

- We examine an understudied class of resultatives involving more than one result XP. Examples include *A guard shot him dead off his horse* (Cappelle, 2005), in which there are two independent result states, that of being *dead* and that of being *off his horse*.
- We propose that these resultatives involve a *nested causal chain of eventualities*, in which the event denoted by the verb causes the first result state, which in turn causes the second result state. This is implemented by adopting a composition rule of CAUSATIVE FORMATION, which introduces a causal relationship between two eventualities (Dowty, 1979; Kratzer, 1996; Bittner, 1999; Williams, 2015).
- In proposing this analysis, we argue against a previous analysis due to Ausensi & Bigolin (2021), which analyzes the second result XP in a multiple resultative as a *low depictive*, demonstrating that such an analysis does not capture the interpretative properties of these constructions.
- We discuss the implications of the existence of multiple resultatives for constraints on resultatives, particularly the UNIQUE PATH CONSTRAINT (Goldberg, 1991), which restricts the theme of an event to holding one result state per clause.
- On our approach, the purported effects of the UNIQUE PATH CONSTRAINT are instead modulated by independent properties of the cause relation interacting with world knowledge, such that examples motivating the UNIQUE PATH CONSTRAINT involve states that cannot cause the state introduced by the second result XP.

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2 The Unique Path Constraint

- Work analyzing the expression of resultativity in English argues that there can only be one result state predicated in a single clause (Tenny, 1987, 1994; Goldberg, 1991, 1995; Levin & Rappaport Hovav, 1995; Tortora, 1998; Rappaport Hovav, 2008, 2014; Beavers & Koontz-Garboden, 2017; Iwata, 2020; Ausensi & Bigolin, 2021; Ausensi, 2022, *i.a.*).

- (1) a. *Jonas beat the man **bloody** unconscious.
b. Jonas beat the man bloody.
c. Jonas beat the man unconscious.
- (2) a. *Martha hammered the metal **into the ground** flat.
b. Martha hammered the metal into the ground.
c. Martha hammered the metal flat.

- Tenny (1987: 190) originally proposed that “there may be at most one ‘delimiter’ associated with a verb phrase”, where bounds are either provided by verbs which are inherently limited (3), or by result phrases which act as delimiters (4) (cf. Vendler, 1957; Dowty, 1979; Kearns, 2000).

- This is indicated by the (in)felicity of telic *in*-phrases, which measure how long it takes for the event to reach the bound provided by the delimiting phrase, and atelic *for*-phrases, where the activity persists for some amount of time without entailing that any bound is reached.

- (3) a. John died in 3 minutes/#for 3 minutes.
b. John broke the vase in 3 minutes/#for 3 minutes.
- (4) a. John wiped the table clean in 3 minutes/#for 3 minutes.
(cf. John wiped the table for 3 minutes)
b. John beat the man unconscious in 3 minutes/#for 3 minutes.
(cf. John beat the man for 3 minutes)

- Tenny’s (1987) Generalization (cf. Giannakidou & Merchant, 1999; Kratzer, 2005) has been formulated in different ways:

1. Goldberg (1991) proposed the UNIQUE PATH CONSTRAINT, which states that only one ‘path’, i.e., a change of state or location, can be predicated of a single entity within the same clause.
2. Tenny (1994) further developed the SINGLE DELIMITING CONSTRAINT, whereby a clause can be delimited only once, as discussed above.
3. Tortora (1998) proposed the FURTHER SPECIFICATION CONSTRAINT after observing that directed motion verbs of the *arrive* type (e.g., *fall*, *come*, *return*) permit result phrases but only if they further specify the change of location encoded by the verb as in *John arrived in Barcelona*.

- The UNIQUE PATH CONSTRAINT (henceforth UPC) by Goldberg (1991) (see also Goldberg, 1995), as defined in (5), is possibly the best known constraint when it comes to semantic restrictions on the number of result states that the theme can be predicated of in a single clause.

(5) UNIQUE PATH CONSTRAINT: if an argument X refers to a physical object, then more than one distinct path [= *one result state*, emphasis ours] cannot be predicated of X within a single clause. (Goldberg, 1991: 368)

- The purported effects of the UPC can be illustrated by the following examples (from Goldberg, 1991: 368, 370). In each of these examples, there are two XPs, each describing a different change resulting from the activity denoted by the verb.

(6) a. *Sam kicked Bill **black and blue** out of the room.
b. *He wiped the table **dry** clean.
c. *Sam tickled Chris **off her chair** silly.

- Further, verbs that encode a change of state or location, i.e., result verbs (in the sense of Rappaport Hovav & Levin, 2010), are argued to disallow result phrases that introduce distinct result states than the one encoded by the verb (Rappaport Hovav & Levin, 1998, 2010; Rappaport Hovav, 2008, 2014; Beavers & Koontz-Garboden, 2012).

- The following examples are thus also ruled out by the UPC since the verbs encode either a change of location (e.g., *fall*) or a change of state (e.g., *break*), whereas the result phrases denote a distinct result state than the one encoded by the verb.

(7) a. *She **carried** John giddy. (Simpson, 1983: 147)
b. *Bill **broke** the vase worthless. (Jackendoff, 1990: 240)
c. *The vase **fell** broken. (Rappaport Hovav, 2014: 23)

- Yet, there are some examples that appear to violate the UPC, as they involve result verbs and PPs denoting a distinct result state, i.e., a change of location, as illustrated in (8) (examples (8-a) and (8-b) from Levin & Rappaport Hovav, 1995: 60).

(8) a. The cook **cracked** the eggs into the glass.
b. Daphne **shelled** the peas onto the table.
c. He **broke** the walnuts into the bowl. (Goldberg, 1991: 376)

- However, the UPC as defined in (5) does not constrain the number of result states per clause, but rather the number of result states that can be predicated of *a single entity* in the same clause.

- Levin & Rappaport Hovav (1995) themselves suggest that examples of the type in (8) are possible since the two distinct result states are predicated of distinct entities, i.e., in (8-a) the eggshells break, whereas the contents move. This led Levin & Rappaport Hovav (1995: 60) to suggest that “the restriction [= one result state per clause] may be that only one change per entity may be expressed in a single clause” (see also Beavers & Koontz-Garboden, 2017).

- Another class of examples involves cases where there appear to be two result XPs. On further inspection, however, these do not encode two separate results; rather one XP serves as the result while

the other serves to provide further information about the first result XP (Rappaport Hovav & Levin, 2010; Beavers, 2011).

- (9) a. The terminals of the wire are both *hammered flat* into a leaf-shape. (GloWbE)
 b. He pounded the dough *flat* into a pancake-like state. (Goldberg, 1991)
 c. The liquid froze *solid* into a crusty mass. (Goldberg, 1991)

- These examples are not a problem for the UPC, as the two XPs can be understood as jointly describing a single result state (Goldberg, 1991).

3 Multiple resultatives

- The central empirical aim here is to show that the UPC, even if reformulated in terms of “one change per entity,” does not hold up empirically.
- To this end, Ausensi & Bigolin (2021) identify 2 classes of *multiple resultatives*.
- The first class involves result verbs in Levin’s sense (*melt, burn, crush*) appearing to specify the manner component of a resultative construction with a separate XP encoding result.

- (10) a. Metal components *melted* into the ground. (COCA)
 b. Flared gas [...] is directly *burnt* into the atmosphere. (Web)
 c. Sailor finishes his beer [...] steps on it, *crushing* it *flat*. (COCA)
 (Ausensi & Bigolin, 2021)

- In these cases, one result state is contributed by the verb, while the second is contributed by the AP or PP.
- The second class, which will be our primary focus in this presentation, appears at first glance to be much like the class of cases involving further specification of the state introduced by the first XP, e.g., *The liquid froze solid into a crusty mass*.
- However, in contradistinction to such examples, the two XPs really do describe conceptually incompatible results, e.g., *Foley shot him dead off his horse* (Web).
- In other words, one cannot appeal to an analysis on which the second XP is a modifier of the state introduced by the first, since the two XPs denote result states that cannot be conceived of as describing the same state.
- Telling examples have been noted in (scant) previous work (Cappelle, 2005; Iwata, 2020; Ausensi & Bigolin, 2021); naturally-occurring examples also abound in readily available corpora (more in the appendix). These examples all involve a verb followed by two separate, independent result XPs, and can be seen in (11).

- The examples in (11-a)-(11-b) show APs followed by PPs and (11-c)-(11-d) show PPs followed by PPs, suggesting that the result XPs possible are (at least partially, which we return to later) independent of the syntactic category of the result phrases.

- (11)
- Marcher Amelia Boynton [...] *clubbed* **unconscious** to the ground during the first charge. (COCA, from Iwata, 2020)
 - A few days later the dust settled and we discovered that the dunes had been *swept* **clean** into beautiful rippled contours, a silver lining after all. (Web)
 - He refused and the men punched him to the head, *knocking* him **unconscious** onto the footpath. (Web)
 - They spotted a man waiting in ambush in a tree. J.B. was quick on the draw and *shot* him **dead** out of the tree! (Web, from Ausensi & Bigolin, 2021)

- It is clear that the proposed constraints on the expression of resultativity as described above will predict all of the examples in (11) to be impossible; contra the prediction, all of these examples are perfectly natural and in fact, occur relatively frequently.
- For example, Tenny's SINGLE DELIMITING CONSTRAINT is clearly violated here, since the clauses above are all delimited twice by different XPs, e.g., the clubbing activity is delimited by the AP *unconscious* and the PP *to the ground* (11-c).
- Note further that because all the above examples involve two distinct changes denoted by the respective XPs applied to a single entity, the surface object, the explanation for the acceptability of the examples in (8), i.e., *crack the eggs into the glass*, will not apply to the examples in (11).
- For example, there is simply no interpretation of (11-a) on which part of Amelia Boynton became unconscious while another part of her landed on the ground because of clubbing, parallel to *crack the eggs into the bowl*. Clearly, this example involves two changes applied to the same individual and not parts of the same individual that can be regarded as distinct entities.
- Further, the examples in (11) do not involve result verbs in Levin's (1993) sense; rather, these all involve 'manner' verbs, verbs that describe non-scalar change. As such, the result XPs are not further specifying a result that is already encoded in the verb ('weak' resultatives as in Washio 1997), parallel to Tortora's examples with motion verbs, i.e., we are not dealing with the FURTHER SPECIFICATION CONSTRAINT in these examples.
- Given the data presented here, the pertinent question to ask is: what is the status of the two result XPs in examples like (11) and what can they tell us about the status of constraints like the UPC?

4 Multiple resultatives as low depictives? Ausensi & Bigolin (2021)

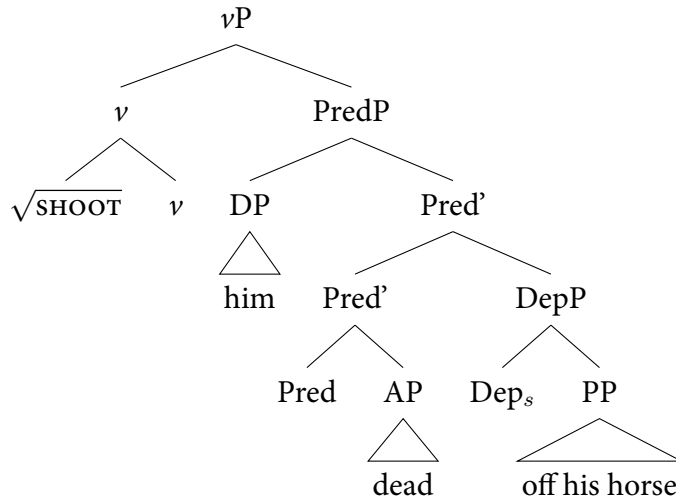
- In light of the data that present challenges to the UPC and related semantic constraints, Ausensi & Bigolin (2021) propose to maintain a *syntactic* formulation of the UPC along the lines of Tenny (1994), but with a different understanding of the status of the additional XP in examples like (11) (see also Acedo-Matellán et al. to appear).

- The central insight remains the same as [Tenny](#), that is, that there is a constraint barring two XPs expressing result within a single clause.
- Working within a neo-constructionist framework to argument structure broadly in line with DISTRIBUTED MORPHOLOGY, resultative constructions are taken to be on par with lexical causatives; they involve a causative little ν head selecting for a result small clause, with a root adjoined to little ν specifying the manner in which the result is achieved ([Harley, 2005](#); [Mateu, 2012](#); [Mateu & Acedo-Matellán, 2012](#); [Acedo-Matellán & Mateu, 2015, a.m.o.](#)).
- The core intuition on this account: only one XP can serve as syntactic complement to ν_{CAUSE} . Any additional XP must integrate with the resultative structure in a way that ensures it is not a syntactic complement and therefore, not interpreted as being caused by the causing event introduced by ν .
- We can now see how [Ausensi & Bigolin](#) would deal with cases of multiple resultatives. Consider the first class, where a result verb appears to specify the manner component of a resultative, repeated below.

- (12) a. Metal components **melted** into the ground. (COCA)
 b. Flared gas [...] is directly **burnt** into the atmosphere. (Web)
 c. Sailor finishes his beer [...] steps on it, **crushing** it flat. (COCA)
 ([Ausensi & Bigolin, 2021](#))

- The key intuition would be that these result verbs are integrated in a ‘manner’ position, i.e., adjoined to ν (see also [Yu et al., 2023](#)). If so, then there is only one result XP serving as complement to little ν and no violation of a syntactic UPC occurs.
- However, this strategy is not obviously available for dealing with the second class of cases with two separate result XPs in combination with a manner verb.
- If the UPC is to be maintained as a syntactic constraint, and an analysis on which the second result XP further specifies the state introduced by the first XP is not tenable, then a separate explanation must be sought for how the second XP is integrated into the structure.
- To this end, following [Acedo-Matellán et al. \(to appear\)](#), [Ausensi & Bigolin](#) propose that there is indeed only one XP serving as complement to little ν , which is the one immediately adjacent to the verb. The second XP is integrated not as a modifier, but as a *low depictive*.
- Intuitively, these are similar to regular depictives that modify VPs (e.g., *eat the meat **raw***); the only difference is that a low depictive is predicated of the result state in a resultative construction rather than at the eventive level in (13).

- (13) A guard *shot* him **dead** off his horse.



(Ausensi & Bigolin, 2021, 592)

- This low depictive analysis, as Ausensi & Bigolin argue, captures the fact that there is no need for the two XPs to denote compatible results; they are never in a modification relationship and can therefore denote conceptually unrelated states.
- Ausensi & Bigolin further claim that this explains why the second result XP is interpreted as overlapping with the first result XP to the exclusion of the manner event.
- Most importantly for their purpose, a syntactic account of the UPC can be maintained, since there is only one XP that is interpreted as result, i.e., complement to an eventive little ν .

4.1 Against a low depictive analysis

- In what follows, we argue that a low depictive analysis, in fact, makes incorrect predictions about the interpretative properties of multiple resultatives.
- On Ausensi & Bigolin's analysis, in resultatives with two XPs introducing conceptually unrelated results, the second XP modifies the other as a *depictive*.
- While they do not provide an explicit compositional semantics, given they follow the analysis due to Acedo-Matellán et al. (to appear) for Old Spanish, we may assume a semantics of the Dep(ictive) head like in (14), where the variable e and e' can range over events or states and the run times of e and e' must overlap (e.g., Pyllkkänen, 2008, adopted by Acedo-Matellán et al. to appear).

$$(14) \quad \llbracket \text{Dep} \rrbracket: \lambda P_{e,vt}. \lambda x. \exists e' [\tau(e) \circ \tau(e') \wedge P(x)(e')]$$

- Taking an example like *shot him dead off his horse*, we may represent the semantic relationship between the two XPs as follows in (15) (PredP in (13)) applying PREDICATE MODIFICATION, and assuming Pred introduces the argument of the AP. As desired, this asserts that the run time of the state of being dead overlaps with the run time of the state of being off the horse.

$$(15) \quad \llbracket [\text{him} [[\text{Pred dead}] [\text{Dep} [\text{off his horse}]]]] \rrbracket : \\ \lambda s. \text{DEAD}(\text{him})(s) \wedge \exists s' [\tau(s) \circ \tau(s') \wedge \text{OFF}(\text{him})(\text{his horse})(s')]]$$

- The next stage of the composition involves the introduction of ν introducing causative semantics, which is further modified by the manner root. Drawing on Kratzer's (2005) semantics for causation, we may represent this complex ν head in (16). This then combines with the PredP in (15), introducing the causal relation between the shooting event and PredP in (17).

$$(16) \quad \llbracket [\sqrt{\text{HAMMER}} \nu_{\text{CAUSE}}] \rrbracket : \lambda P_{v,t}. \lambda e. \exists e' [\text{HAMMER}(e) \wedge \text{CAUSE}(e, e') \wedge P(e')]$$

$$(17) \quad \llbracket [\nu P] \rrbracket : \lambda e. \exists s' [\text{SHOOT}(e) \wedge \text{CAUSE}(e, s') \wedge \text{DEAD}(\text{him})(s') \wedge \exists s'' [\tau(s') \circ \tau(s'') \wedge \text{OFF}(\text{him})(\text{his horse})(s'')]]]$$

- However, we can immediately appreciate a severe problem with this analysis: because no causal relationship is required to hold between the state introduced by the putative depictive (the state of being off the horse) and the other eventualities in the formula in (17), there are no constraints on when the state of being off the horse begins.
- Moreover, the semantics of the depictive introduces only a very weak temporal relationship between the state introduced by the first result XP and the second, such that the runtime of the second state need only overlap with the the runtime of the first.
- This leads to two major problems: first, contexts that satisfy the condition of temporal overlap between the state of death and the state of being off the horse, but involve a significant amount of time between the beginning of the state of death and that of the state of being off the horse, render our running example markedly infelicitous (18).

(18) CONTEXT: The sheriff fired at the bandit who was escaping on his horse after robbing the local store. The shot hit the bandit's heart and he died on his horse immediately. The horse continued galloping, and the bandit's body was knocked off later when it hit a tree branch ... #The sheriff shot the bandit dead off his horse.

- Second, and even more problematic, the formula in (17) is compatible with a situation in which the bandit's state of being off the horse in fact begins *before* the shooting, and therefore *before his death*, as in (19) below. In this case, temporal overlap is satisfied, as the runtime of the dead state is in fact *included* in that of the off-the-horse state. In such a context though, a multiple resultative is infelicitous.

(19) CONTEXT: After riding into town, the bandit hopped off his horse for a few beers at the local saloon. The sheriff spotted the bandit and quickly shot him dead ... #The sheriff shot the bandit dead off his horse.

- In short, we see that the broader issue with assuming a depictive relationship between the two XPs is that it does not entail the right temporal relationship between the two results.

5 Multiple resultatives as true resultatives

5.1 Multiple resultatives have a resultative meaning

- Ausensi & Bigolin’s analysis of multiple resultatives fails to capture the basic temporal relationship between the eventualities at play in a multiple resultative.
- Moreover, we see clear evidence for a *resultative* relationship holding between the eventualities.
- For one, note that the fact that the two result states need to be fairly close together in time, as shown by the infelicity of (18), is a hallmark example of a constraint on resultatives noted by Goldberg (1995): a sentence like *Chris shot Pat dead* “cannot be used to mean that Chris shot Pat and Pat later died in the hospital; instead it must mean that Pat died immediately from the shot” (Goldberg 1995:195).
- What’s more, contexts in which another, intervening event causes the state introduced by the second result XP render sentences with multiple resultatives infelicitous.
- First, consider (20). Here, the bandit’s falling off his horse is caused by the horse’s actions, and thus, the sentence is infelicitous in the context.

(20) CONTEXT: The sheriff fired at the bandit who was escaping on his horse after robbing the local store. The shot hit the bandit’s heart and he died on his horse immediately. At the same time the bandit was shot, his horse ran into a tree and the bandit’s body was knocked off the horse, so...
#The sheriff shot the bandit dead off his horse.

- However, once a causal relationship between the two result XPs is established, the sentence is rendered acceptable; in (21), we observe that our running example sentence is felicitous. Although the bandit’s being off the horse does not immediately follow his being shot, it *does* follow his death.

(21) CONTEXT: The sheriff fired at the bandit who was escaping on his horse after robbing the local store. The shot hit the bandit’s heart, and he died on his horse immediately. His body went limp, and slowly slipped off the horse...
OK The sheriff shot the bandit dead off his horse.

- We illustrate here with another minimal pair involving a different manner verb and different result XPs, e.g., *knocked senseless into the bottom of his boat*.

(22) CONTEXT: A policeman chased a fugitive to the dock where his boat was docked. The policeman knocked the fugitive with the boat’s oar so forcefully that he immediately lost his senses. At the same time, the policeman’s partner kicked the fugitive into the boat, so...
#The policeman knocked the fugitive senseless into the boat.

- (23) CONTEXT: A policeman chased a fugitive to the dock where his boat was docked. The policeman used the boat's oar to knock the fugitive with such force that he immediately lost his senses, and then stumbled and fell into the boat, so...
 OK The policeman knocked the fugitive senseless into the boat.

- The intuition here seems clear: the first context in each of the above examples is infelicitous because *there is no causal relationship between the two result XPs*.
- On Ausensi & Bigolin's low depictive analysis, no difference in felicity between the two kinds of example is expected; this is because all that is required is that the two states denoted by each XP have overlapping runtimes, regardless of the presence of a causal relationship between them.
- It seems, then, that there needs to be a *temporal and causal relationship between the states introduced by the two XPs tighter than simple temporal overlap*.

5.2 Analysis: composing multiple result XPs via Causative Formation

- Given the key interpretive property of resultatives with two conceptually unrelated XP results, we propose a different understanding of how they are related.
- Specifically, we propose the eventualities introduced by the two XPs together stand in a *causal relationship* with one another.
- This intuition can be formally implemented using a rule of CAUSATIVE FORMATION, building off of similar rules throughout the literature (Rothstein, 2004; Kratzer, 2005; Williams, 2015).
- This rule takes as input two constituents of type $\langle e, vt \rangle$, returning as output a new type $\langle e, vt \rangle$ function that, when supplied with an individual argument, produces a predicate of eventualities (events or states) that causes the result eventuality.

(24) Causative Formation:

$$f_{e,vt} + g_{e,vt} \rightarrow \lambda x. \lambda e. f(x)(e) \wedge \exists e' [g(x)(e') \wedge \text{CAUSE}(e, e')]$$

- Applying this rule to an example like *shoot the bandit dead off his horse*, the two XPs compose with one another by CAUSATIVE FORMATION (25-a). The result then composes further with the verb via the same rule (25-b).
- The individual argument is saturated last as in other complex predicate approaches to resultatives (Dowty 1979; Williams 2015, a.o.).

- (25) a. $\llbracket \text{dead off his horse} \rrbracket: \lambda x. \lambda s. \text{DEAD}(x)(s) \wedge \exists s' [\text{OFF}(x)(\text{his horse})(s') \wedge \text{CAUSE}(s, s')]$
 b. $\llbracket \text{shoot dead off his horse} \rrbracket: \lambda x. \lambda e. \text{SHOOT}(e) \wedge \text{THEME}(e) = x \wedge \exists s [\text{CAUSE}(e, s) \wedge \text{DEAD}(x)(s) \wedge \exists s' [\text{OFF}(x)(\text{his horse})(s') \wedge \text{CAUSE}(s, s')]]]$
 c. $\llbracket \text{shoot the bandit dead off his horse} \rrbracket: \lambda e. \text{SHOOT}(e) \wedge \text{THEME}(e) = \text{the bandit} \wedge \exists s [\text{CAUSE}(e, s) \wedge \text{DEAD}(\text{the bandit})(s) \wedge \exists s' [\text{OFF}(\text{the bandit})(\text{his horse})(s') \wedge \text{CAUSE}(s, s')]]]$

- Note now that causation must hold not only between the shooting event and the bandit's state of death, but also between the state of death and the state of being off the horse.
- While the idea that states can cause other states is perhaps not common, other authors have independently argued that causation between states is possible (e.g., [Ramchand, 2008](#); [Rothmayr, 2009](#); [Hirsch, 2018](#)).
- This means that the only interpretation predicted to be possible is *that the state of being off the horse is directly caused by the bandit's death, which is in turn directly caused by the shooting event*, capturing the observed contrast between (20) and (21) and between (22) and (23) above.

5.3 The UPC as emerging from causal structure

- On our approach, multiple resultatives genuinely involve two result states predicated of the same entity in one clause, and are thus genuine violations of the UPC.
- Given that, on our analysis, a causal relationship exists between the two result states in such resultatives, it actually gives us a new perspective on sentences that appear to motivate the UPC.
- In particular, we will argue that such sentences, though having well-formed *logical forms*, are deviant due to *pragmatic factors* arising from clashes between the causal relation between the result states and world knowledge concerning the causal powers of those result states.
- Consider the example in (26) below.

(26) *Sam kicked Bill **black and blue** out of the room.

- On our analysis, (26) has the logical form in (27).

(27) $\exists e[\text{KICK}(e) \wedge \text{AGENT}(e) = \textit{sam} \wedge \text{THEME}(e) = \textit{bill} \wedge \exists s[\text{CAUSE}(e,s) \wedge \text{BLACK-AND-BLUE}(\textit{bill})(s) \wedge \exists s'[\text{OUT-OF}(\textit{bill})(\textit{the room})(s') \wedge \text{CAUSE}(s,s')]]]]$

- In this case, while (27) is assigned a logical form, it requires that a state of being black and blue causes Bill to be out of the room.
- We claim that this is the source of the deviance of the example, as states of being heavily bruised do not generally cause motion.
- Note that if we modify the prepositional phrase to encode a result state that *can* be caused by a state of heavy bodily damage, the example is perfectly well-formed, as in the naturally occurring example in (28).

(28) In the end, Ei has to beat him **black and blue** into unconsciousness (Web)

- The same reasoning applies to many cases of AP + AP resultatives, which have been used to motivate the UPC in the previous literature. For example, in the following, *bloody* states do not directly cause *unconscious* states, nor do *clean* states directly cause *dry* states.

- (29) a. *Kim beat Bill **bloody** unconscious
 b. *Kim wiped the table **clean** dry.

- The putative effects of the UPC, then, arise from an interaction between the causal structure of such sentences and independent knowledge about what sorts of events and states are able to bring about what other sorts of states.

5.4 Result verbs with result XPs

- While we have focused on one class of multiple resultatives, we have also seen another discussed by [Ausensi & Bigolin \(2021\)](#): those with a result verb in manner position with a separate result XP (30-a), and those with two XPs that specify the starting and ending points of a path of change.

- (30) a. Think of Katika Lashore, and the way she heals up after **tearing** her skin open. (COCA)
 b. This time I didn't **melt** the chocolate into the custard mixture. (GloWbE)

- These examples are also amenable to a treatment on the approach developed here.
- For example, if we follow [Beavers & Koontz-Garboden \(2020\)](#) in treating the roots of these verbs as predicates of states with an entailment of change, the analysis is exactly parallel to the approach above for two result XPs: the state contributed by the verb causes the state provided by the result XP (see [Yu et al. 2023](#) for an alternative approach).

- (31) $\lambda x.\lambda s.\exists e[\text{CAUSE}(e,s) \wedge \text{MELT}(\textit{the chocolate})(s) \wedge \exists s'[\text{INTO}(\textit{chocolate})(\textit{the custard mixture})(s') \wedge \text{CAUSE}(s,s')]]$

5.5 Resultatives with two XPs jointly describing a result state

- Finally, we return to a class of apparent multiple resultatives that are not a problem for the UPC, in which a second XP further specifies the state introduced by the first, repeated below for convenience.

- (32) a. The terminals of the wire are both *hammered* **flat** into a leaf-shape. (GloWbE)
 b. He pounded the dough **flat** into a pancake-like state. ([Goldberg, 1991](#))
 c. The liquid froze **solid** into a crusty mass. ([Goldberg, 1991](#))

- A question on our approach is how such examples are derived, and why Causative Formation apparently cannot apply to them.
- First, we propose that the “further specification” reading arises via a separate composition rule, a generalized version of PREDICATE MODIFICATION ([Heim & Kratzer, 1998](#)), which conjoins the two state descriptions.
- As for the absence of a reading of such examples as genuine multiple resultatives, we can appeal to the same explanation we had for ruling out deviant examples like *Sam kicked Bill black and blue*

out of the room: the *flat* state of the dough is incapable of causing the dough's state of being *in a pancake-like state*.

- Reasoning in the opposite direction, *the sheriff shot the bandit dead off the horse* cannot be composed by PREDICATE MODIFICATION, because *dead* and *off the horse* cannot be predicated of one and the same state.
- Thus, the range of possible readings of resultatives with multiple apparent result XPs is modulated by pragmatic constraints regardless of which rule is used to compose them.

6 Loose ends: other UPC examples and AP + AP results

- We close with discussion of a gap in the data that has yet to be discussed, namely, the UPC violating examples in (7) above, repeated below in (33), and the lack of resultatives with two consecutive AP + AP results. For example, even controlling for the causal requirement between two result XPs, the example in (34) is ungrammatical.

- (33) a. *She **carried** John giddy. (Simpson, 1983: 147)
b. *Bill **broke** the vase worthless. (Jackendoff, 1990: 240)
c. *The vase **fell** broken. (Rappaport Hovav, 2014: 23)

- (34) *Jonas beat the man **black and blue** unconscious.

- Nothing given in the account of resultatives with XP + XP results so far explains why these cases, of which judgments seem robust, are ruled out. That is, CAUSATIVE FORMATION should be able to apply and derive a nested chain of eventualities, on par with *shoot the bandit dead off his horse*.
- Nonetheless, it is most likely that independent constraints rule out these cases.
- First, the examples in (33) can be explained by the scalar requirements placed on result XPs in resultatives discussed by Wechsler (2005).
 - Durative verbs like *carry* preferably take maximal endpoint closed-scale result XPs, but *giddy* is open-scale.
 - Likewise, *break* is a punctual verb, but *worthless* is a maximal endpoint closed-scale adjective, another incompatibility Wechsler (2005) discusses.
 - Finally, *broken* is a deverbal adjective, which are generally unacceptable in resultatives (Embick, 2004).
- As for AP stacking, first, AP stacking is simply unattested in English even outside of resultative contexts, e.g., in simple predicative contexts.
- When possible, the right-peripheral AP can only be interpreted as depictive; in simple predicated contexts, this is often facilitated by an intonational break between the two APs.

- (35) a. John is tired (*and) sleepy. \nRightarrow John is both tired and sleepy (coordination required)
 b. John is happy, naked. \Rightarrow John is happy when he is naked

- This observation carries over directly to resultatives; to the extent that resultatives with AP + AP are interpretable, the second AP is most naturally construed as a depictive at the eventive level, i.e., it predicates of the manner event rather than of the first AP as proposed by [Acedo-Matellán et al. \(to appear\)](#) and [Ausensi & Bigolin \(2021\)](#).

- (36) a. *Kim wiped the table clean dry. \nRightarrow as a result of wiping the table became clean, which led to it being dry
 b. Lucy wiped the table clean, dry. \Rightarrow Lucy wiped the table clean while it was dry (though it got wet after she finished wiping it)

- While it is unclear what the exact constraint behind stacking of APs in any context is, it seems reasonable to conclude that this constraint is not limited to resultative constructions and is a more general phenomenon.
- If so, then the lack of resultatives with AP + AP results should not be taken as evidence of a syntactic or semantic constraint on the multiple expression of results in resultative constructions in general, nor does it invalidate the proposal advanced here that there are particular kinds of semantic relationships that hold between the multiple XPs in resultative constructions.

7 Conclusion

- We examined an understudied class of resultatives involving more than one result XP, proposing that these resultatives involve a nested causal chain of eventualities.
- We implemented this by adopting a rule of CAUSATIVE FORMATION, which relates the second result XP to the first in a causal chain, i.e., the state introduced by the first result XP causes the state introduced by the second.
- The approach developed here has the advantage of correctly predicting the interpretative properties of the resultatives at stake, in contrast to the approach developed by [Ausensi & Bigolin \(2021\)](#) which, in proposing that the second result XP joins the syntactic derivation as a low depictive, makes incorrect predictions regarding the range of possible interpretations of these examples.
- Returning to the broader issue of the constraints that hold on the expression of resultativity, such as the UNIQUE PATH CONSTRAINT ([Goldberg, 1991](#)), we agree with [Ausensi & Bigolin \(2021\)](#) that these constraints do not hold up empirically if they are taken to be semantic constraints.
- On the other hand, our approach suggests that multiple resultatives containing two conceptually unrelated result XPs occurring with a manner verb are subject to interpretive constraints, namely that a causal relation must hold between the first and second XP.

- Cases cited previously as supporting the UPC can be explained on this approach by appealing to the interaction of the causal structure of these examples with real-world knowledge about what states are able to cause which other kinds of states.
- Overall, this suggests a more nuanced view of constraints on the expression of resultativity. There are clearly cases that pose problems for such constraints as previously formulated in the literature, and they can be given separate analyses in terms of how the two putative result XPs are related to each other that point us toward a better understanding of how the expression of resultativity is constrained.

8 Appendix

- (37) Resultatives with *manner verbs* and an **AP** and **PP** introducing two distinct result states.
- In the end, Ei has to *beat* him **black and blue** into unconsciousness. (Web)
 - They spotted a man waiting in ambush in a tree. J.B. was quick on the draw and *shot* him **dead** out of the tree! (Web, from Ausensi & Bigolin, 2021)
 - Or I could just brute force things and *hammer* the nail **flat** into the wood. (GloWbE)
 - He had been *knocked* **senseless** into the bottom of his boat. (GloWbE)
 - Crispy or thin crust does not get a rising period or only a short one in a bowl before it is *rolled* **flat** into the pan. (Web)
 - They would dig these huge holes and tell our men to stand by them as they *shot* them **dead** into the grave. (Web, from Ausensi & Bigolin, 2021)
 - He refused and the men punched him to the head, *knocking* him **unconscious** onto the footpath. (Web)
 - A few days later the dust settled and we discovered that the dunes had been *swept* **clean** into beautiful rippled contours, a silver lining after all. (Web)
- (38) Resultatives with **result verbs** and a **result XP** introducing an unrelated result.
- Your [...] cooked bacon might be overcooked and the cheese might **melt** out of the hamburger. (GloWbE)
 - Think of Katika Lashore, and the way she heals up after **tearing** her skin open. (COCA)
 - This time I didn't **melt** the chocolate into the custard mixture. (GloWbE)
 - Under water, he swims to Lexi, who is apparently losing oxygen fast, and fires his eye lasers at the ropes binding her, successfully **burning** them loose. (Web)
 - The methods of obtaining blocks involve first isolating them by cutting narrow trenches then **splitting** them free from the bed. (Web)

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