Strong Resultatives as a Bounded PathPP Construction: PathPP Structure and Parametrized Path Head Movement

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1. Introduction

This paper examines a resultative construction by comparing it with several path related constructions (section 2). It advances an analysis in which they all have a bounded path P (section 3). Its covert variant underlies some of the path related constructions and the resultative construction in question. We will see (section 4) that the semantic property and the properties related with the phonetic emptiness of a bounded path P derive various characteristics of both of the constructions. I will discuss implications and questions about the present analysis, one of which concerns the dual source of apparently the same meaning (section 5).

2. Resultative Constructions and Bounded PathPP

Washio (1997) argues that **resultatives** are divided into at least two types, strong and weak resultatives. **Strong Resultatives** are those in (1a, b):

(1) *Strong* Resultatives
    a. The horses dragged the logs smooth.
    b. John hammered the metal flat.
    c. *Uma-ga   maruta-o subesube-ni   hikizutta.   *Japanese*
       horse-Nom log-Acc smooth-Adv   dragged
       'The horses dragged the logs smooth.'
    d. *Gianni ha martellato il metallo piatto.   *Italian*
       'The horses dragged the logs smooth.'

One of their characteristic properties is that the verbs themselves do not imply any change of state or any result. Nevertheless sentences (1a, b) certainly imply some result. Where the result reading comes from has been intriguing curious linguists for a long time. It is also significant that as in (1c, d), Strong Resultatives are missing in Japanese and Romance languages including Italian.

By contrast, there is a kind of resultative construction (2) in which verbs do imply some change of state (verbs of accomplishment or achievement). Washio calls them **Weak Resultatives** (see also Randall (2010), who recognizes the same difference and calls examples like (2) Pseudoresulatives):

(2) *Weak* Resultatives
    a. John painted the wall red.
    b. I froze the ice cream hard.
    c. Jon-ga kabe-o   aka-ku   nutta.   *Japanese*
       J.-Nom wall-Acc   red-Adv   painted
       'John painted the wall red.'
    d. Ha dipinto la macchina rossa.   *Italian*
       'He painted the car red.'

As (2c, d) show, Weak Resultatives are present in Japanese and Romance languages.[1] The two kinds of resultatives, therefore, manifest themselves differently from language to language: Strong Resultatives are present in Germanic but missing in Japanese and Romance languages, but Weak ones are found in all of these languages. This strongly indicates that the two types of resultatives are to be treated differently. That's what I do in this paper, and I will focus on the strong type of resultatives.

Having separated Strong Resultatives from Weak ones, we immediately notice an interesting correlation between Strong Resultatives and some **path-related constructions**. Consider examples like (3-5). Examples in (3) have **intransitive manner-of-motion verbs** and **path PPs**. They are present in Germanic but not in Romance, as discussed by Talmy (1985) and not in Japanese either. What is interesting with the PP *under the bridge* in the second example of (3) is that it is ambiguous between locative and directional readings. And it is crucial here that the directional reading is missing in Romance as well as Japanese counterparts.

(3) a. The ball rolled **down the hill**.
    b. The balloon floated **under the bridge**.

Examples in (4a, d) have **transitive directed motion verbs** and **path PPs**, discussed in, for instance, Goldberg (1995). They are again present in Germanic but not in Romance and Japanese. The French examples in (4) are cited from Jones (1996: 394):

(4) a. Peter hit the ball **to the other end of the pitch**.
    b. *Pierre a tape le ballon **a l'autre bout du terrain**.   (=(4a))   *French*
    c. *Piitaa-ga booru-o   **picchi-no   hantaigawa-ni**   utta.   (=(4a))   *Japanese*
        Peter-Nom ball-Acc   pitch-Gen   the other side-to   hit
    d. Charles hammered the nail **into the wall**.
    e. *Charles a martele le clou **dans le mur**.   (=(4d))   *French*
    f. *Chaaruzu-ga kugi-o   (hanmaa-de)   **kabe-ni** utta   (=(4d))   *Japanese*
        Charles-Nom nail-Acc (hammer-Instr)   wall-into hit

Examples in (5) are **verb-(DP-)particle** constructions. This kind of particles are present in Germanic but not in Romance, as pointed out by Levin and Rapoport (1988) and they are not found in Japanese, either.

(5) a. Pat put the gabage **out**.
    b. The soldiers went **down**.

Now the natural question to ask is: why do Strong Resultatives pattern with these path-related constructions? I'd like to propose an analysis according to which Strong Resultatives are an instance of the path-related constructions. I will show that the analysis gives an answer to the question we have faced, namely, where the result reading of Strong Resultatives comes from, and, furthermore, explains many properties of Strong Resultatives and the above-mentioned path-related constructions.

3. Proposals

Koopman (2010) argues that path PPs and particles syntactically contain a (covert) prepositional head. The type of path relevant here is a **Bounded Path**, which selects a place PP for a complement, as in (6a).[2] Essentially the same idea is implemented by the notions of conceptual structure by Jackendoff (1990), as in (6b):

(6) *into the room*:   a. [$_{PathPP}$ to [$_{PlacePP}$ in [$_{DP}$ the room]]]
                        b. [$_{Path}$ TO [$_{Place}$ IN [$_{Thing}$ ROOM]]]

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[1] To various extent. They are very restricted in French and Italian but fairly rich in Japanese; see also Napoli (1996)

[2] I will not consider the morphosyntactic make-up of *into* here.

This captures the ambiguity of sentence (7a) in terms of the following two structures, one of which contains a covert PathP head, as in (7b):

(7) a. The balloon floated under the bridge.
    Ambiguous between directional and locative readings
 b. The balloon floated [PathPP e [PlacePP under [DP the bridge]]] Directional
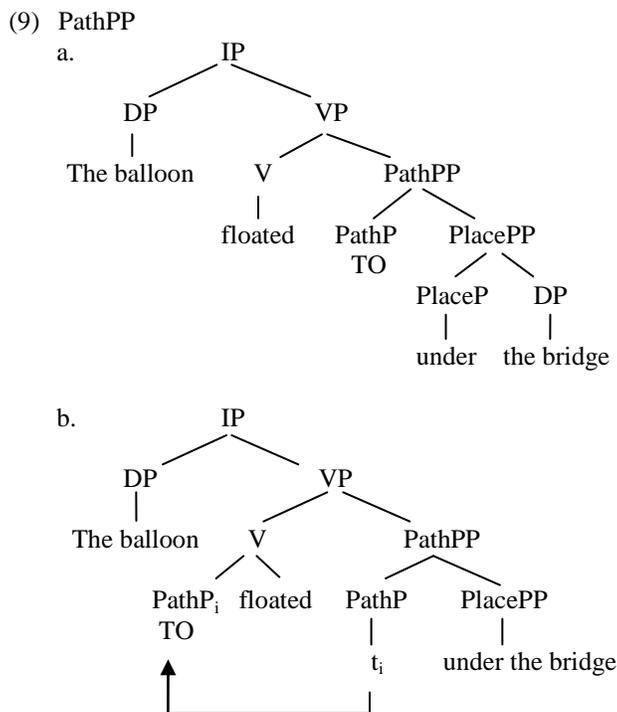 c. The balloon floated [PlacePP under [DP the bridge]]   Locative

I will show in this paper that Koopman's type of path PPs should be extended to Strong Resultatives, in which the path is to be understood an abstract path to a state.

I'd like to make a simple but central proposal that Strong Resultatives syntactically contain a bounded path P head that may select AP, as well as PlacePP, for a complement:

(8) [PathPP [PathP e] AP/PlacePP]

To this I add two more assumptions for Strong Resultatives, which are originally made for path PP constructions by Noonan (2010). First I assume that the empty path P is licensed by incorporating to the main V. I take a stance in which head movement is narrowly syntactic, although if not I believe its effect could be obtained by some phrasal alternative, which is Noonan's implementation. Second, also following and extending Noonan, the PathP movement is available in Germanic but not in Romance and Japanese languages.
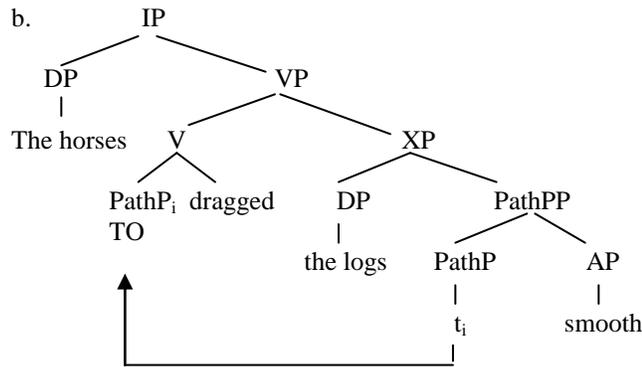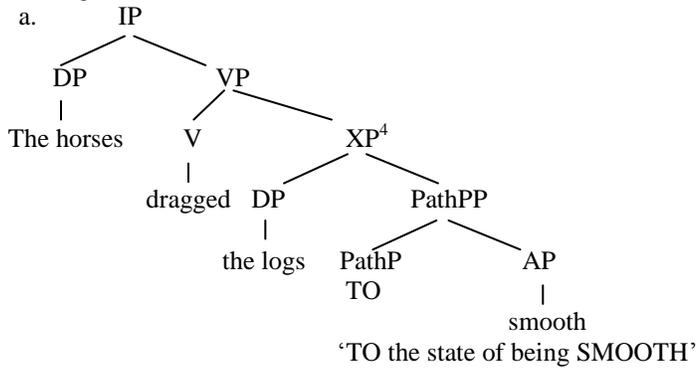
Let's take a look at sample derivations of a manner-of-motion verb construction (9) and a Strong AP Resultative (10).[3]

(9) PathPP

a.
```
              IP
           /      \
         DP         VP
         |        /    \
   The balloon   V      PathPP
                 |      /      \
              floated PathP    PlacePP
                       TO     /      \
                          PlaceP      DP
                            |          |
                          under    the bridge
```

b.
```
              IP
           /      \
         DP         VP
         |        /      \
   The balloon   V        PathPP
              /    \      /      \
          PathPᵢ floated PathP   PlacePP
            TO           |          |
                         tᵢ    under the bridge
```

I put TO under PathP just to indicate that it expresses a bounded path. PathP selects PlacePP *under the bridge* here and it is phonologically empty so that it has to be associated locally with the non-null verb. Since English has an option of moving it to V, as in (9b), the P is licensed and the derivation converges. It is reasonable to take the movement as syntactically deriving the verb of movement out of the verb of the manner of motion and the PathP.

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[3] I ignore the unaccusativity of the verb in (9) for the sake of brevity.

(10) Strong AP Resultative

a.
```
            IP
          /    \
        DP      VP
         |     /  \
   The horses V    XP⁴
             |    /  \
         dragged DP    PathPP
                 |    /     \
            the logs PathP    AP
                     TO       |
                           smooth
```
'TO the state of being SMOOTH'

b.
```
             IP
           /    \
         DP      VP
          |     /  \
    The horses V     XP
            /  \    /  \
       PathPᵢ dragged DP   PathPP
        TO           |    /     \
                the logs PathP    AP
                          |       |
                          tᵢ    smooth
```

In (10), the empty PathP selects AP *smooth*. It is licensed by being raised to V, exactly the way it is in (9).

Given the PathP-AP structure in (8, 10), I assume that it provides <u>the meaning of the change of state, or the meaning of result</u>. First consider the directional meaning of the PP *under the bridge* in (9). It means that a change of location of a balloon takes place and it ends up being under a bridge. Now compare this with the meaning of the PathP-AP structure [[$_{Path}$ e] [$_{AP}$ *smooth*]] in (10). The result interpretation is derived as a change of state of logs taking place and them ending up in the state of being smooth. We can see that the interpretation is just like that of *under the bridge*; the meanings of the two types of changes are parallel (see Goldberg 1995 for essentially the same insight as a metaphorical extension without postulating the empty PathP).

I make two more comments about the PathP movement. One of the underlying ideas is that the empty head needs to be supported by, or associated locally with, a non-null head. This is nothing fancy and commonly assumed. If this option is not available in a language, an empty head cannot be licensed, the other conditions being equal.

Notice that not any kind of non-null head can license the empty path head. It has to be locally associated with V. This relation between PathP and V cannot be an accident. We can observe more instances of their relation. For example, in languages like Mandarin Chinese, path heads can be syntactically realized as verbs as well as prepositions. I refer the readers to Klipple (1991: 105), who points out that in Mandarin, one morpheme *dao*, for instance, can be P corresponding to *to* and also V corresponding to *arrive*. It might be the case that the path sense requires the local association of PathP with V, hence the movement of PathP to V.[5] It is interesting that, based on Dutch data, Koopman (2010: 64) projects a verbal projection on top of PathPPs, which could be considered an alternative way to express the same intuition.

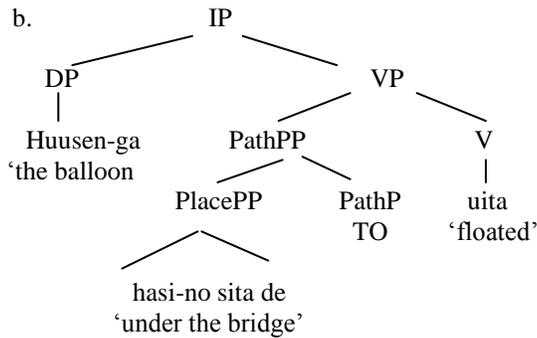[4] I simply assume some kind of small clause. I will not go into details here.

[5] Heidi Harley (personal communication) points out that a question remains of whether the relatedness of path to V is the general property of paths or limited only to the empty head. See section 5 for more discussion and related residual questions.

4. Consequences

The analysis proposed here has a number of consequences. Confirm, first, that it accounts for the co-variation of PathP constructions and Strong Resultatives. With the empty path head underlying both of the constructions, the presence of the empty PathP movement derives the co-occurrence of the constructions in a given language and its absence, their co-absence.[6]

The analysis simultaneously derives the correlating non-ambiguity of the Japanese counterpart (11a) of (7) *The balloon floated under the bridge.* Consider its structure in (11b). I simply assume that Japanese is head-final:

(11) a. Huusen-ga   hasi-no   sita de uita.
      balloon-Nom   bridge-Gen under at floated
      'The balloon floated under the bridge.'

b.

```
                        IP
              _____/  _____
            DP                      VP
            |                  _____/  \____
        Huusen-ga          PathPP            V
        'the balloon       /    \            |
                    PlacePP      PathP       uita
                     /  \         TO      'floated'
              hasi-no sita de
              'under the bridge'
```

In order for the sentence to have a directional interpretation, *hasi-no sita de* 'under the bridge' must be headed by the empty PathP, as in (11b). Since Japanese lacks its movement, however, the PathP remains in-situ and unlicensed because it must be locally associated with a non-null verbal head. This derives the reason the sentence has no directional reading in Japanese. The same explanation should apply to Romance counterparts.

To see a second consequence, notice that some PPs lose a directional reading when displaced, as in (12).

(12) a. **In the goal** John kicked the ball.
     b. **In the wall** Charles hammered the nail.
     c. **Under the bridge** the balloon floated.

This follows from the lack of the licensing of the empty Path P in the preposed position in (13a): the PathP-to-V movement from up in the preposed position down to V would be improper. Even if PathP movement precedes PP fronting, the trace of the fronted PathP would be unbound (13b). The last possibility would be that LocPP moves while PathP remains in situ (13c), but I just assume here that it is not an acceptable option.

(13) a. *[$_{PathPP}$ [$_{PathP}$ e] In the goal]$_i$ John kicked the ball t$_i$.
     b. *[$_{PathPP}$ t$_i$ In the goal]$_j$ John [$_V$ [$_{PathP}$ e]$_i$ kicked] the ball t$_j$.
     c. *[$_{LocPP}$ In the goal]$_i$ John kicked the ball [$_{PathPP}$ [$_{PathP}$ e] t$_i$].

Third, the present analysis correctly predicts a property parallel to (12) for Strong Resultatives, as in (14).

(14) a. ***Smooth** the horses dragged the logs.

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[6] The logic of the explanation here goes through because there is no **overt** bounded PathP (corresponding to English *to*) in Romance/Japanese. If there were, it could stay in-situ, be licensed (because it is not empty) and give rise to a V-PathPP construction. I leave aside the explanation of its absence in these languages.

b. ***Flat** John hammered the metal.

c. *[PathPP [PathP e] Smooth]i the horses dragged the logs ti

The result APs cannot be preposed. This is explained just like (12). When the empty PathP is fronted, as in (14c), it cannot be licensed. Since APs do not give a reading parallel to the general locative readings of PPs in (12), the sentences turn out to be ill-formed.

As a fourth consequence, another parallelism to (12) is detected in DPs like those in (15). In these DP contexts, PPs are locative but not directional. Likewise, APs mean a simple state but do not mean any change of a state.

(15)   the road **in the forest**
        the logs **smooth** enough to sell

We should ask why it can be that they are only locative in these contexts but directional in the resultative contexts. This follows from the property of the empty PathP: it is licensed only by V. Without V, therefore, the path reading is not available.

A fifth consequence is that the telicity of Strong Resultatives follows from the telic nature of the PathP, which is the *bounded* path head. Its AP complement is theta-marked as a goal or a final state and therefore delimits an event, just like the goal PP in *John went to the room*. The telic property is observed in the compatibility of result AP with time-bounding *in* but not with durative *for* adjuncts, as in (16).

(16) The horses dragged the logs smooth *in/*for* an hour.   (Wechsler 2001)

This also gives an account of the condition on the adjectives that appear in Strong Resultatives: they are limited to bounded ones. This is a sixth consequence. See (17).

(17) hammer the metal *flat/smooth*
                      *beautiful/*safe/*tubular*   (Wechsler 2001)

Crucial here is the delimitation of an event, implied in the semantics of the empty bounded path P. It selects a place or a property which can provide a goal or a final state. *Flat, smooth* and the like are bounded properties that are compatible with the goal role and so they can give rise to result readings. By contrast, *beautiful*, *safe* and so on are not bounded, leading an event to no result. They are, therefore, unacceptable for a complement of the bounded PathP.

Incidentally, compare (17) with the examples in (2), repeated below, which have adjectives like *red* and *hard*.

(2)   *Weak* Resultatives
      a. John painted the wall red.
      b. I froze the ice cream hard.
      c. Jon-ga   kabe-o   aka-ku   nutta.   *Japanese*
         J.-NOM wall-ACC   red-ADV   painted
         'John painted the wall red.'
      d. Ha dipinto la macchina rossa.   *Italian*
         'He painted the car red.'

The adjectives are not bounded but the examples are well-formed. This shows that these Weak Resultatives do not contain an underlying bounded PathP. They probably are based on the well-known operator BECOME (or its syntactic equivalent) inherent in the meaning of these verbs. It gives rise to their properties and distributions different from Strong Resultatives.

The final couple of consequences are concerned with language variation. Notice our central proposal (in Strong Resultatives, a bounded PathP head may select AP, as well as PlacePP, for a complement) has one loose implication that, as one option, the empty PathP may select PlacePP but may not select AP in a given language. This can derive finer-grained language differences. Son and

Svenonius (2008) point out that Indonesian, Javanese, and Malayalam allow directional, as well as locative, reading for (18) but at the same time do not allow Resultatives in general, crucially Strong Resultatives, as in (19).

(18) a. Tika {mlaku/mlayu/mbrangkang} ning ngisor jembatan. *Javanese*
          walk/run/crawl   Loc bottom bridge
     ‘Tika walked/ran/crawled under the bridge.’

    b. Mary office-il-ekke {natann-u/oot-i}.   *Malayalam*
          -Loc-Dir   walk-Past/run-Past
     ‘Mary walked/ran to the office.’

(19) a. Mary nyacah daging *(sampek) ajur.   *Javanese*
         beat   meat   until   flat
     ‘Mary beat the man until it became flat.’

    b. *Hari table vritti tuda-ccu.[7]   *Malayalam*
     Hari table clean wipe-Past
     ‘Hari wiped the table clean.’

So they have revealed the fact that the directional reading in question and the Strong Resultative do not always correlate. This follows as a seventh consequence in the present analysis if the empty PathP selects PlacePP but not AP, and it is exactly the option it allows.

This loose implication can be tightened if we see a crosslinguistic relation between PlacePP and AP in Strong Resultatives. Namely, a markedness relation like (20) is observed:

(20)

PathP selects	PlacePP	no PlacePP
AP	Germanic	---
no AP	Indonesian/Javanese/Malayalam	Romance/Japanese

To my knowledge, no one has convincingly demonstrated that there is a language in which PathPs select AP but not PlacePP.[8] It seems natural that PathP basically selects for PlacePP and extendedly may select for AP. It would indicate that the notion of property can be conceptualized extendedly as an abstract location (cf. Jackendovian shift of semantic fields). If so, the crosslinguistic markedness relation in (20) is derived by the property of PathP that unmarkedly selects a PlacePP complement and only markedly selects an AP complement.

5. Implications and Questions

In this section, I would like to briefly discuss significant implications and remaining questions concerning the present analysis. First, one of the most significant implications the present analysis has is that certain meanings can be achieved in more than one way. In particular, the meaning of, informally put, the change of state may be given by BECOME or TO (Bounded Path) if represented in

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[7] According to Washio’s classification, this example is a type of Strong Resultative in which a verb (wiping) strongly predisposes a certain change of state (tables to become clean) though it implies nothing.

[8] Actually, Son and Svenonius argue that Korean is such a language, crucially depending on just one verb (and the absence of PathP constructions), as in (i).

   (i) Inho-ka   kumsok-ul   yalp-key twutulki-ess-ta.
     Inho-Nom   metal-Acc   thin-KEY pound-Past-DC
     ‘Inho pounded the metal thin.’

They claim that the verb *twutulki*, glossed as ‘pound’, is an activity verb that does not imply any change of state and, therefore, that (i) is a Strong Resultative. My informant says, however, that the verb does imply some change of state of the metal like change of integrity or shape. We seem to need more research.

They also take Japanese as the other language that has AP resultatives but not PathP constructions. As I have argued in this paper, however, though Japanese indeed has Weak AP Resultatives, they are irrelevant to the correlation we have been considering. Japanese does lack both Strong Resultatives and PathP constructions.

conceptual terms (cf. Jackendoff 1990 and others). We highlighted the fact that even if a language has a semantic operator BECOME (or its syntactic equivalent), it may not have all kinds of the change of state constructions. Japanese has BECOME, which presumably underlies Weak Resultatives that it has, but has no Strong Resultatives. The present analysis has offered an account in which Strong Resultatives express the change of state by means of TO, not relying on BECOME.

Second, extending the present analysis, it seems plausible to make a strong claim that there cannot be a semantic element (like BECOME/TO) irreducible to structural elements. In the present analysis, the component of the change of state is localized to PathP. Although PathP is sometimes invisible, it overtly manifests itself in a family of the related PathP constructions including PP resultatives like (21) and a covert P variant seems to be a natural extension.

(21) a. Tory broke the eggs into the bowl.
     b. They laughed John out of the room.
     c. I vacuumed the crumbs off the rug.

(Levin and Rappaport Hovav 2005)

Interestingly, PathPPs and particles, which denote movement or direction, are acquired very early in English and they are frequently observed in verbless sentence fragments even in adult utterances. Strong Resultatives are likely to appear later as a variant of the same PathP constructions with the empty version of PathP. If a change-of-state component cannot just appear out of blue, we can understand that Japanese/Romance lack Strong Resultatives because these languages also lack overt PathPs and particles which are the basis for the empty PathP that expresses results that are not implied by verbs. Recall that we have revealed the properties of the empty PathPs; though it may be invisible, it is there in structure.

Finally, according to Talmy's (1991) well-known generalization, Romance languages frame paths lexically in verbs. Notice that the analysis proposed in this paper amounts to a claim that an empty Path is syntactically 'framed' in verbs in Germanic languages (by PathP-to-V movement). It suggests a stronger generalization that Path must be verb-framed universally (see footnote 2). It might be associated with a verb either lexically, as in Romance/Japanese, or syntactically, as in Germanic languages.

The examples in (22), however, indicate otherwise. When a PathP is overtly expressed, the path reading is not lost if it is fronted:

(22) a. **Into the goal** John kicked the ball.
     b. **Into the wall** Charles hammered the nail.

If (some kind of) verb-framing of PathP is general for all the PathPs including overt ones, we have a question of why this separability of PathP from V in (22) is fine. I would like to leave the questions for future research.

6. Conclusion

I have demonstrated in this paper that Strong Resultatives are a type of PathP constructions. They co-vary with other PathP constructions. They yield the change-of-state meaning by extending the meaning of the change of location in an abstract way. The availability of their result readings depends on (locally associated) verbs.

I also have examined the questions and implications of the analysis. Among others, I have suggested that an apparently single semantic property, the change of state, or the result, actually has two sources. True or not, they certainly are worth further investigation.

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