The cognitive basis of adjectival and adverbial resultative constructions*

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In this paper I investigate adjectival resultative constructions, which usually do not occur in Romance languages, and adverbial resultative constructions, which are also possible in Romance languages. I claim that adjectival resultative constructions and adverbial resultative constructions rely on different cognitive processes. In particular, I contend that adjectival resultative constructions involve the activation of Langacker's billiard-ball model. Such an analysis turns out to be more satisfactory than formal ones. On the other hand, adverbial resultative constructions, as well as more generally adverbial depictive constructions, are argued to involve the process of property ascription by the conceptualiser and the reference point ability. Finally, I show that adverbial (resultative) constructions exhibit similarities with so-called raising constructions in that both crucially rely on the reference point ability.

Keywords: resultative construction, billiard-ball model, property ascription, reference point ability, raising construction

1. A resultative paradox

Resultative constructions (see Boas 2003; Broccias 2003; Rappaport Hovav and Levin 2001 among many others) code a causal relation between two events within a single clause. Consider (1):

(1) a. John hammered the metal flat.
    b. *John martellò il metallo piatto. (Italian)
    c. John appiattì il metallo a colpi di martello. (Italian)
       John flattened the metal at blows of hammer
       'John flattened the metal by hammering it'

Sentence (1a) illustrates the adjectival resultative construction. The event of John's hammering the metal caused the event of the metal's becoming flat. The former event is expressed by the verb, the latter event is metonymically evoked by the adjective (phrase) *flat*, which specifies the state reached by the metal (i.e. the metal's resultant state). As is well known (see Talmy 2001:Ch. 1), Romance languages such as Italian generally lack adjectival resultative constructions as well as prepositional resultative constructions (e.g. *Sally rocked the baby to sleep*). The word-by-word translation of (1a) into Italian, see (1b), is not acceptable. Nevertheless, it is possible to translate (1a) into Italian by using a single-tensed clause (instead of a complex sentence corresponding to English *John hamered the metal until it became flat*), see (1c). One must express the resultant state by way of the tensed verb (i.e. *appiattire* 'to flatten') and code the manner in which such a state was brought about by way, for instance, of a prepositional phrase.

Interestingly, Quirk et al. (1985:560) and Geuder (2000) note that one can sometimes code the notion of result by employing an adverb rather than an adjective, preposition, or noun phrase (viz. *Sally painted the room a beautiful shade of blue*). Consider the following examples ((2a–c) from Quirk et al. 1985, (2d) from Geuder 2000):

(2) a. She fixed the car perfectly.
     b. He grows chrysanthemums marvellously.
     c. The soldier was wounded badly.
     d. He loaded the cart heavily.

The adverbs *perfectly* and *marvellously* in (2a) and (2b) imply respectively that the car was in a perfect state as a result of the action of fixing it and that the chrysanthemums grown by the subject referent were marvellous. Similarly, the soldier in (2c) ended up with a bad wound. Finally, the cart in (2d) could be described as having a heavy load because of the event of the subject referent's loading it. Geuder (2000) calls adverbs like those occurring in (2) *resultative adverbs*. However, in keeping with Croft's (2001) proposal concerning the primacy of constructions, I regard the label *adverbial resultative construction* as being more appropriate and only metonymically speaking will I use that of "resultative adverb" (to refer to an adverb occurring in a clause which conveys a resultative meaning).[1]

If we substitute the related adjectives for the adverbs in (2), we obtain sentences which are at best regarded as colloquial variants, as is indicated by the diacritic "#" in (3) below.

(3)   a.   #She fixed the car perfect.
     b.   #He grows chrysanthemums marvellous.
     c.   #The soldier was wounded bad.
     d.   #He loaded the cart heavy.

The problem obviously arises as to why (3a), for example, is not as good as (1a) if both code a resultative meaning.[2] Secondly, we observe that Italian allows word-by-word translations of adverbial resultative constructions, as is shown in (4):

(4)   a.   Sally painted the room {#beautiful/beautifully}.
     b.   Sally dipinse la stanza {*magnifica (adj.)/magnificamente (adv.)}

In other words, why are adverbial resultative constructions possible also in Italian if Romance languages usually lack (non-adverbial) resultative constructions? In the light of such inter- and intralinguistic evidence (i.e. the contrast between (1a) and (3a), for example, and the one between (1b) and (4b)), I propose that adjectival resultative constructions and adverbial resultative constructions imply different cognitive processes.[3] I will now turn to their elucidation by first analysing adjectival resultative constructions in Section 2 (which sums up some of the points made in Broccias 2003) and, subsequently, adverbial resultative constructions in Section 3 (which greatly expands on Broccias's 2003 cursory analysis). The reader should be aware that my analysis will focus on transitive rather than intransitive examples (e.g. *The kettle boiled dry*, *The pond froze beautifully*). Nevertheless, the proposals advanced here can be easily extended to such cases as well (see Notes 11 and 14).[4]

2.   Adjectives in resultative constructions

In this section, I argue that adjectival resultative constructions denote a force-dynamics scenario (i.e. the Force Change Schema) as is apparent from the pivotal role played by the (interrelated) notions of force construal and (complete) affectedness (see 2.1). I also expose some weaknesses in Wechsler's (2001) formal model for capturing adjective selection (see 2.2) because they will highlight, by contrast, the nature of the Force Change Schema as a composite (or blended) structure capable of distinguishing between compressed and uncompressed events (via, for example, the notion of animacy).

2.1   The billiard-ball model

Building on previous analyses of resultative constructions (in particular Gold-berg 1995), Broccias (2003) stresses that (non-adverbial) resultative con-structions can be described in terms of the experiential model (or cognitive archetype) dubbed billiard-ball model by Langacker (1991). He observes that:

> "[w]e think of our world as being populated by discrete physical objects. These objects are capable of moving about through space and making contact with one another. Motion is driven by energy, which some objects draw from in-ternal resources and others receive from the exterior. When motion results in forceful physical contact, energy is transmitted from the mover to the im-pacted object, which may thereby be set in motion to participate in further interactions.
>
> Let us refer to this way of thinking about the world as the **billiard-ball model**." (Langacker 1991:13)

In sum, we think about the world in terms of energetic interactions between entities resulting in some change in their properties (because such entities are affected). Figure 1 represents in diagrammatic fashion the relevance of the billiard-ball model to the semantic characterisation of adjectival resultative constructions such as (1a).

The schema in Figure 1 is called Force Change Schema[5] and results from the merger (or integration or blending in the sense of Fauconnier and Turner 2002) of two components, the event component and the change component. In the case at hand, the former (corresponding to the lower left-hand box) describes a forcible interaction (*F*, symbolised as *hammered*) between two en-
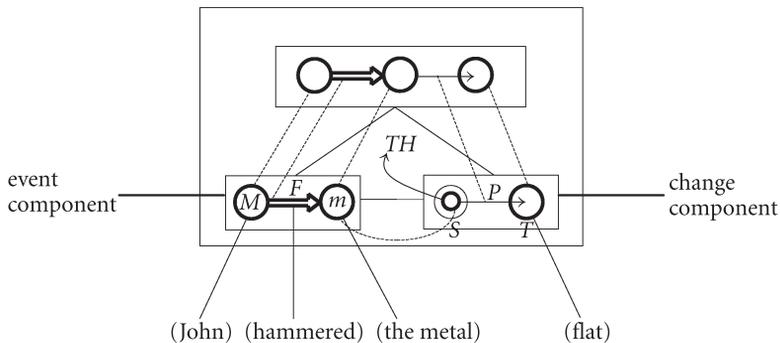

Figure 1. The Force Change Schema for *John hammered the metal flat*

tities, a manipulator (M) and a manipulee (m), which are instantiated by *John* and *the metal* respectively. Such an energetic interaction causes (as is suggested by the linear order of the two lower boxes in Figure 1) a change of state of the affected entity (i.e. m). Such a change is visualised as the lower right-hand box called change component. It depicts a theme (TH) undergoing a change of state by (metaphorically) moving along a path (P) from its initial state S (for source) into its final state T (for target). In the relevant example, T corresponds to *flat* and S to the previous non-flat state of the metal, although this has not been shown in the diagram. Further, the manipulee and the theme are referentially identical as is indicated by the dashed correspondence arc linking the two. Note also that only the theme circle and the target circle within the change component have been emboldened in Figure 1. This is intended to represent the fact that only such (sub)components within the change component are symbolised (i.e. realised phonologically). Finally, the upper box in Figure 1 represents the composite structure resulting from the merger of the event and change components. The straight dashed lines indicate referential correspondences between the subcomponents of the Force Change Schema. The source component (S) has not been reproduced in the upper box for the sake of simplicity. On the other hand, the path subcomponent, which is also not symbolised at the phonological pole, has been included so as to make the notion of transition metonymically evoked by the adjective explicit.[6]

It is worth pointing out that the event component does not necessarily correspond to a force component (i.e. it does not necessarily describe an energetic interaction between a manipulator and a manipulee). Consider the following example:

(5)   Sarah kissed the anxiety away from Keith.

Sentence (5) causally relates the event of Sarah's kissing Keith to the event of the anxiety's "moving" away from him, as is shown in Figure 2.

The relation between *Sarah* (the trajector *tr* in the event component) and *Keith* (the landmark *lm* in the event component) is depicted by way of a simple straight arrow rather than a thick force arrow as in Figure 1, where the "energetic" labels manipulator and manipulee were used in place of the neutral (with respect to semantic roles) terms trajector and landmark. This is so because the verb *kiss* probably is not by-default (i.e. independently of the resultative construction) interpreted force-dynamically. Further, the landmark in the event component is in small capitals (i.e. KEITH) because it is not realised phonologically but is only activated at the semantic pole of such a component. The
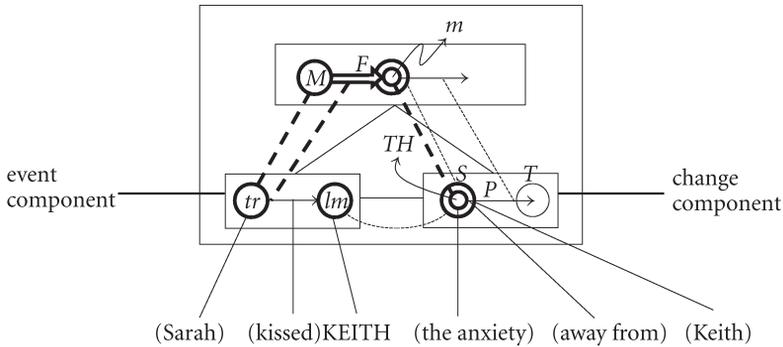
Figure 2. The Force Change Schema for *Sarah kissed the anxiety away from Keith*

landmark of the event component is equated to the source (*S*) out of which *the anxiety* (i.e. *TH* in the change component) is removed. In other words, a psychological state is conceptualised metaphorically as on object moving out of a person/location. Crucially, it is *Keith* as a source which undergoes symbolisation, as Figure 2 shows. Even more interestingly, Figure 2 visualises the operation of force construal (by way of the emboldened dashed lines connecting *tr* to *M* and *TH* to *m* as well as the emboldened dashed arrow linking the arrow for *kissed* to the thick force arrow in the upper box). That is, at the level of the integrated (or blended) structure depicted as the upper box, the event of Sarah's kissing Keith is construed as a force that Sarah (as a manipulator) exerts upon *the anxiety* (the manipulee), thus causing the metaphorical change of position of the latter (out of *Keith* as a source region).[7]

Force-construal is at its most evident in "creative" (i.e. non-entrenched) uses of the resultative construction, such as Goldberg's (1995) well-known example *to sneeze a napkin off the table* (where *sneeze* is conceptualised as a force acting upon *the napkin* thus causing its movement *off the table*) and the following really occurring example:

(6)   I have tried 'smoking' goals in (Arsenal once scored as three of us were lightning cigarettes, [...]). (Nick Hornby, *Fever Pitch*, 1996: 110)

As the single quotes in (6) indicate, the use of *smoke* is felt by the writer as an extension of its collocational potential. Crucially, the event of smoking is interpreted (on the part of the narrator) as a force capable of bringing about changes by potentially allowing Arsenal, the team the narrator supports, to score.

   Evidence for the relevance of the billiard-ball model to the semantic description of resultative constructions, and hence the notion of force-dynamics and the non-sufficient nature of causality as a licensing factor for their use, comes from the centrality of the notion of affectedness. Halliday (1994: 148) offers the following minimal pair:

(7) a. *They crossed the field flat.
     b.   They trampled the field flat.

Although both examples could in principle code causality since the verbal event is intended to describe the cause for the change of state of *the field* (which becomes *flat*), only (7b) is acceptable. Sentence (7a) is not allowed because *cross* does not imply the exertion of a force upon the traversed path, whereas *trample* in (7a) explicitly codes an energetic interaction (i.e. *F* in Figure 1 above) between the subject and object referents. Of course, we could wonder why *cross*, unlike *kiss* in (5) and *smoke* in (6), cannot undergo force construal. The reason simply seems to be that there already exist verbs (such as *trample*) which code force-dynamics and hence they probably block force construal for *cross* (but see Note 8 for an alternative explanation).[8]

   Not only do resultative constructions code affectedness but they also require (if possible) what we could term *complete affectedness*. In other words, the following generalisation seems to hold:

(8) *The part-whole affectedness generalisation*
     If an adjective in a resultative construction describes a property P of an
     affected object Y, then P describes any part of Y (if possible).

As a matter of illustration, consider the following examples:[9]

(9) a. *He hammered the metal {long/tubular}.
     b. *He painted the room beautiful.
     c. *He loaded the cart heavy.

The examples in (9) are all covered by the part-whole affectedness generalisation. Whereas *flat* in *John hammered the metal flat*, see (1a) above, can describe the state of any arbitrarily chosen part of the metal, this is not the case with the adjectives occurring in (9). *Long* and *tubular* in (9a) could only be predicated of the affected entity (i.e. *the metal*) as a whole: we can choose parts of it which are neither long nor tubular, of course. Similarly, *beautiful* in (9b) is intended to describe the room as a whole; arbitrarily chosen parts of it may not necessarily be beautiful. Finally, *heavy* in (9c) is intended to specify a property

of the cart as a whole, but we can select parts of it which are not heavy at all. I will refer to adjectives which are mass-like in that they describe properties of any arbitrarily chosen part of an object (e.g. *flat*) as *part-whole adjectives*.[10] On the other hand, adjectives which refer to some property of an object as a whole (e.g. *beautiful*, *heavy*) will be termed *gestalt adjectives*.[11]

The part-whole affectedness generalisation is also compatible with the contrast in (10), from Verspoor (1997):

(10) a. ?He danced himself sore.
      b. He danced his legs sore.

If the intended interpretation of (10a) is that only the subject referent's legs were affected as a result of the dancing event, (10b) is more natural than (10a). The use of *sore* in (10a), according to the part-whole affectedness generalisation, would imply that the whole affected entity (i.e. what Y = *himself* = *he* stands for) was in the state of being sore, contrary to the intended reading. Hence, the replacement of *himself* with *his legs* as in (10b) results in a perfect example (vis-à-vis the intended interpretation).

The qualification in parentheses at the end of the part-whole generalisation is needed in the light of examples like (11a) and (11b):

(11) a. Milton read himself blind.
      b. I saw him coming back, carrying two sacks that were heavy so [sic] they pulled his arms **long**.
          (Matthew Kneale, *English Passengers*, 2000:258)

Blind in (11a) can only refer to a part of Milton's body, namely his eyes; hence, contrary to what is the case in (10a), the use of the reflexive pronoun *himself* is felicitous. Sentence (11b) contains the gestalt adjective *long*, which we observed was impossible in (9a). Two possible lines of reasoning (not necessarily mutually exclusive) can be followed when trying to motivate the acceptability of (11b). It could be argued that *long* describes a spatial *configuration* rather than a *property*, which implies that the part-whole affectedness generalisation does not apply to it. *Long* specifies that the arms of the referent of the possessive determiner *his* were arranged vertically (and possibly that the person in question was in a stooping position). Thus, *long* could be de facto a synonym of *down*. Alternatively, it could be claimed that the verb *pull* in (11b) makes inevitable reference to the affected object as a whole. Whereas the action of hammering in (1a), *John hammered the metal flat*, can be carried out *within* the metal, the

action of pulling in (11b) cannot be performed "within" the arms: the latter necessarily targets the object as a whole.

To sum up, in this subsection I have proposed that adjectival resultative constructions can be characterised in terms of the experiential model called billiard-ball model by Langacker (1991) as evidenced by the centrality of the notion of complete affectedness.

2.2 A note on adjectival selection

The apparently rampant idiosyncrasy in the use of adjectives in resultative constructions (cf. (9a) above) has often led researchers to despair of finding constraints (or generalisations) capturing their occurrence. Quite recently, however, Wechsler (2001) developed (for the first time ever) a formal model which accounts for many cases of adjective selection. It will suffice here to say that Wechsler's model predicts two cases (which I have slightly paraphrased in the light of the terminology used in this paper):

Case 1. If the theme (i.e. *TH*) argument is shared (i.e. the theme argument is a subcategorised object of the verb in isolation as in *He hammered the metal flat*, cf. *John hammered the metal*), then homomorphism and coextension between the verbal event and the change event is required (i.e. they must unfold together).

Case 2. If the theme argument is not shared (i.e. the theme argument is not subcategorised by the verb as in *Sally laughed herself silly* vs. **Sally laughed herself*), then homomorphism and coextension between the verbal event and the change event is not required (i.e. they need not unfold together).

Homomorphism means that parts of the verbal event must correspond to parts of the change event and vice versa. For example, in *Sally wiped the table clean*, parts of the event of cleaning correspond to parts of the event of the table's becoming clean, that is the path metonymically signalled by the adjective *clean* (which denotes its final point). The term coextension in the definitions above makes it clear that the verbal event must begin when the affected theme is at the start of the change path and end when the affected theme reaches the end of the change path. In other words, homomorphism between the telic event and the path obtains at the same arbitrary point in time along a(n initially and finally) bounded time arrow. For the sake of simplicity, I will refer to homomorphism and coextension simply as homomorphism.

It can be shown (see Broccias 2003 for a detailed analysis) that Wechsler's model runs into various problems. For example, temporal gaps do occur between the verbal event and the change event in subcategorised object resultative sentences:

(12)   [headline] Student stabbed to death.
        [text]   He was treated by a paramedic and taken by helicopter to hospital, but he died soon afterwards. (*The Guardian* 14.9.1999)

Student in (12) is a subcategorised argument of the verb *stab* (and would have a direct object role in the active sentence *Someone stabbed a student to death*). Still, the text makes it clear that the student died after the event of stabbing took place, when he was in hospital. Hence, the event of stabbing, although overlapping to some extent with the event of dying, did not unfold together with it, contrary to what *Case 1* above predicts. Similarly, Rappaport Hovav and Levin's (2001) example *The critics panned the comedy out of town* implies that the comedy (was) moved out of town after the critics had severely criticised it (and here overlapping between the two events may not have taken place at all). Therefore, subcategorised object cases do not always require homomorphism.

Broccias (2003) offers a different explanation for homomorphism effects. He claims that homomorphism depends on the notion of "animacy" (see Broccias 2003: 149–155 in particular). That is, homomorphism correlates with the conceptualisation of the theme as an inanimate entity. Sentence (12) above, for example, contains an animate theme (i.e. the student) and Rappaport Hovav and Levin's (2001) example also implies reference to an animate theme since *comedy* stands metonymically for the people involved in it (i.e. the actors). Consider also the following examples:

(13)   a.   Sally sprayed her skin wet.
        b.   Sally sprayed her skin soft.

Her skin is a subcategorised object of *spray* (cf. *Sally sprayed her skin*). But whereas the natural interpretation of (13a) is that the event of Sally's spraying her skin and that of her skin's becoming wet unfolded together, this is not necessarily the case in (13b) (contrary to what *Case 1* predicts). The skin may have become soft after the event of Sally's spraying it had ended. Such an interpretation relies on our different conceptualisation of the skin in the two examples at hand. In (13a), the skin is conceptualised as an inanimate surface which is being covered with some liquid substance. Hence, homomorphism is expected. In (13b), on the other hand, some property intrinsic to the skin actively par-

ticipates in the event of its becoming soft. The skin is not conceptualised as an inanimate surface but as a (possibly three-dimensional) entity whose properties bring about some changes in its texture. In this sense, I will say that the skin is animate although, of course, the skin is not engaged volitionally in the event.

Crucially, the correlation between homomorphism and animacy can also be argued to obtain in unsubcategorised object cases, thus demonstrating that the distinction between *Case 1* and *Case 2* is unwarranted if formulated in terms of the syntactic notion of subcategorisation:

(14) a. Sally talked her throat dry.
      b. Sally danced her legs stiff.

In (14a), the interpretation where Sally became aware of her throat's being dry some time after the event of talking ended is virtually impossible despite the fact that *her throat* is an unsubcategorised object (i.e. contrary to what *Case 2* above predicts). This is so because the throat is conceptualised as an inanimate entity, i.e. a surface from which saliva is removed. On the other hand, (14b) allows the reading under which Sally woke up with stiff legs the day after the dancing event (as Rappaport Hovav and Levin 2001 also point out). Such a temporal gap is allowed because we know that muscles, given some intrinsic property, may take some time before they start hurting.

In sum, no existing formal model (to the best of my knowledge) can account for adjectival selection in resultative sentences. Rather, a more satisfactory analysis can be achieved by detailing the cognitive basis of the (non-adverbial) resultative construction, namely the billiard-ball model. Having identified its cognitive "source", we are in a better position to account for adjectival selection and related phenomena such as Wechsler's claim concerning the presence vs. absence of homomorphism between the verbal event and the change of state event. Adjectival selection is linked to the notion of complete affectedness. The apparent occurrence of homomorphism stems from the fact that the Force Change Schema instantiates **event compression** (in the sense of Fauconnier and Turner 2002). In other words, the stabbing of a person and his or her subsequent death as in (12) above (which may not be simultaneous in real time due to the notion of animacy) are compressed into a scene where it is *as if* an entity directly acted onto another thus causing its (immediate) change of state (cf. the upper box in the Force Change Schema in Figures 1 and 2). However, the Force Change Schema distinguishes between the "real" event sequence (cf. the two boxes below in Figures 1 and 2) and the "compressed" event sequence (cf. the upper box in Figures 1 and 2). The former is to be linked to

how the causing and caused events unfolded in real or objective time; further, it is the target of the listener's interpretation of a resultative construction when she avails herself of the notion of animacy. The latter always points to (construed) homomorphism. The import of the Force Change Schema is primarily the depiction of two causally related events in terms of a force-dynamics interaction rather than a fine-grained description of their relation in objective time. The billiard-ball model, and hence the Force Change Schema at the level of the blended component, treats changes as occurring during or immediately after the exertion of force. Wechsler's analysis, on the other hand, disregards the distinction between uncompressed and compressed event sequences by focussing only on subcategorisation frames, which results in incorrect predictions.

3. Cognitive operations associated with the use of adverbs

After having detailed the cognitive basis of adjectival resultative constructions, we can now move to the elucidation of the cognitive operations associated with the use of resultative adverbs. I propose that the two (related) ingredients necessary for their correct characterisation are property ascription by the conceptualiser (see Section 3.1) and the reference point ability (see Section 3.2).

3.1 Property ascription by the conceptualiser

The adverbial resultative constructions in (2), repeated here for the sake of convenience, all refer to "subjective" properties, with the apparent exception of (2d) (as is noted by Geuder 2000).

(2) a. She fixed the car perfectly.
     b. He grows chrysanthemums marvellously.
     c. The soldier was wounded badly.
     d. He loaded the cart heavily.

In other words, if a (naïve and immediately obvious) distinction is drawn between subjective and objective properties, it can be observed that the sentences in (2) (disregarding (2d) for the moment) imply an assessment of the (gestalt) state of an entity (i.e. its being perfect, beautiful, in danger) on the part of the conceptualiser, that is they involve subjective properties. They do not refer to objective properties such as colour and shape, which are routinely (and naïvely) regarded as being out there in the world independently of the con-

ceptualiser (see also Fauconnier and Turner 2002: 79–81 for a similar point). It is also worth pointing out that the properties alluded to by the adverbs in (2) neither refer to part-whole objective properties (such as *flat* in *John hammered the metal flat*) nor need be ascribed to the affected entity by a participant in the event. In order to illustrate the latter point, consider the following contrast:

(15) a.   Sally painted the room {*beautiful/beautifully}.
      b.   Sally danced her legs {sore/*sorely}.

Both *sore* and *beautiful* can be said to refer to non-objective properties in that the former refers to a physical sensation and the latter to an aesthetic judgement. Still, *sore* alone can occur in the adjectival resultative construction. The crucial difference between the two relevant sentences involves the entity which experienced the sensation linked to the adjective. In (15a), beauty was experienced and attributed to the room by the conceptualiser; Sally might or might not have found the room beautiful. Such an external perspective is lacking in (15b), where soreness can only have been experienced by *Sally*, not (also) by the conceptualiser.[12]

Property ascription by the conceptualiser is not limited to resultative cases but involves adverbs more generally since it also obtains with **depictive** (i.e. non-resultative) cases. Consider the following examples:

(16) a.   He nodded wisely.
      b.   He left the room furiously.

The properties of being wise and furious in (16a) and (16b) are attributed to the subject referent by the conceptualiser on the basis of how the subject referent performed the actions of nodding and leaving the room (relative to some standard of comparison). *Wisely* and *furiously* reflect the conceptualiser's judgement and do not imply, for example, that the subject referent *was* wise or furious. Rather, under the circumstances hinted at by the verbs in (16), the subject referent seemed to posses wisdom and to be furious, but he might have feigned such properties (see Geuder 2000 for a similar point).

We can now go back to example (2d), *He loaded the cart heavily*, which apparently refers to an objective property (i.e. heaviness). In fact, I contend that the use of the adverb *heavily* conforms to the requirement of "property ascription by the conceptualiser".

First, suppose that the cart is much less heavy than the total weight of, say, the crates placed on it, so that heaviness can be predicated of both the crates and, derivatively, the cart. Crucially, the gestalt property of heaviness (i.e. the

crates are collectively, but no necessarily individually, heavy) may be attributed to the cart by observing, for example, that there are several crates on it. Such a configuration may naturally lead us to infer that the total weight of the crates is great, as is also, derivatively, the weight of the cart with the crates on it. Hence, property ascription depends on the visual observations and inferences made by the conceptualiser. To put it differently, an external perspective or, in Cognitive Grammar terminology, the subjective axis (see Langacker 1991: 215–220 in particular) is activated. Alternatively, the cart could be described as heavy because of the very few heavy crates placed on it. Here, visual perception would (perhaps) provide no clue to property ascription because of the limited number of crates on the cart. Rather, the conceptualiser could rely on some prior knowledge concerning the fact that each of the very few crates was individually heavy (relative to some standard) in order to conclude that the cart is also heavy. Obviously, this kind of ascription of heaviness to the cart also counts as an instance of subjective property ascription because there exists a relation between the conceptualiser, who is part of what in Cognitive Grammar is referred to as the ground and who activates some prior knowledge, and the objective scene, comprising the cart and the crates to the exclusion of the conceptualiser.

Second, if the cart is much heavier than the crates anyway, the property of heaviness cannot be predicated of the cart as a result of the event of putting crates on it. Hence, the use of the adjective (as in *He loaded the cart heavy*, colloquial usage aside) is not warranted.

To conclude, (2d) is not exceptional at all as it might appear in a formal model like Geuder's (2000). Adverbs rely on the conceptualiser's judgement and hence sentences like (2d) are straightforwardly accounted for. Similarly, sentences like *Sally labelled the bottles greenly (i.e. *Sally put green labels on the bottles*, cf. *He put heavy crates on the cart*, *He loaded the cart heavily*), which could be expected to occur given Geuder's formal model (see Geuder 2000: Chapter 3 for details), are excluded because colours denote part-whole properties and are regarded, in folk theory, as objective (i.e. they need not be inferred by the conceptualiser but are out there in the world).

In sum, adverbial resultative constructions differ from adjectival resultative constructions in that they crucially rely on property ascription by the conceptualiser. S/he interprets perceptual inputs coming from an event in order to categorize, i.e. attribute (likely) properties to, the participants involved in the event.

3.2 The reference point ability

The contrast between (15a), *Sally painted the room {*beautiful/beautifully}*, and (15b), *Sally danced her legs {sore/*sorely}*, illustrates that adverbial resultative constructions depend on the use of an external perspective (rather than the reporting of objective properties) with respect to the coded event since they involve the conceptualiser's judgement (i.e. the subjective axis). In the previous section, I also pointed out (more or less explicitly) that such judgement depends on the event in which the entity under scrutiny is involved. This means that adverbial use is not just licensed by property ascription on the part of the conceptualiser (since adjectives might also be argued to be used for such a purpose) but relies, as I will try to illustrate in more detail in this section, on employing the event as a **reference point** for accessing (properties of) a participant.

   The use of resultative (and depictive) adverbs reveals a form-meaning mismatch. Formally, in an adverbial resultative sentence like *Sally painted the room beautifully*, the use of the adverb is licensed by the presence of a verbal predicate. Semantically, the adverb entertains a predicative relation with an argument of the verbal predicate (rather than the predicate itself) and it does so via its adjectival base (i.e. *the room* can be described as *beautiful*). The situation is illustrated diagrammatically in Figure 3.[13]

   I will now argue that such a form-meaning mismatch can be viewed as an instance of the profile/active zone asymmetry (see Langacker 1999: 62–67 in particular; the term can be regarded as a synonym of metonymy for the present purposes). Consider the following sentences (from Langacker 1999):

(17)   a.   Your dog bit my cat.
       b.   The spacecraft is now approaching Venus.

The nominals *your dog* and *my cat* in (17a) denote (or profile) whole entities, which are represented as the outer circles in Figure 4a below. To be sure, only
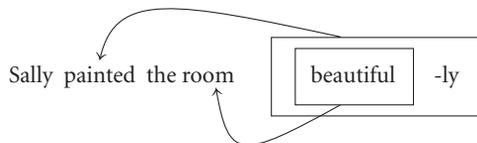

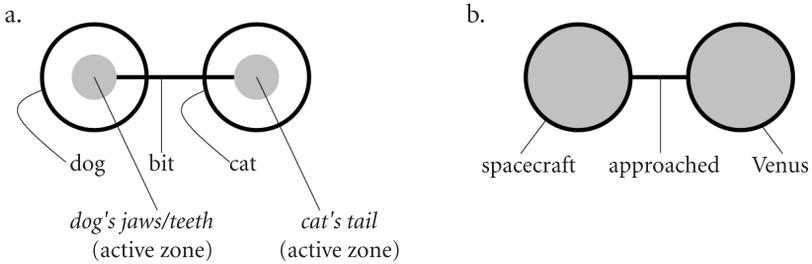**Figure 3.** Form-meaning mismatch for a resultative adverb

Figure 4. Profile/active zone asymmetry

subparts of them were involved in the relation profiled by the verb (i.e. the biting event, depicted as a line in Figure 4a). The relevant subparts were, for example, the dog's jaws and teeth and the cat's tail. Such subparts are called active zones in Cognitive Grammar and stand for the entities most directly involved in the event. They have been depicted as the shaded circles in Figure 4a. In sum, (17a) exhibits a profile/active zone asymmetry in that the nominal expressions profile whole entities but only some of their subparts were actively involved in the event. Sentence (17a) is to be contrasted with (17b), where no asymmetry obtains. The whole spacecraft was approaching the whole planet, as is graphically indicated in Figure 4b.

Crucially, the profile/active zone asymmetry implies the reference point ability, which can be defined as "our capacity to invoke one conceived entity (a *reference point*) for purposes of establishing mental contact with another (the *target*)" (from Glossary in Langacker 1991). In (17a), for instance, *dog* and *cat* are used as reference points for accessing some of their subparts (e.g. the dog's jaws and teeth and the cat's tail). That is, the active zones are targets. I have represented such a cognitive operation in the expanded diagram in Figure 5 by drawing an arrow from the trajector (i.e. *your dog*) and landmark (i.e. *my cat*) to their respective active zones or targets.

Note also that the line indicating the biting event has been broken up into two lines in Figure 5. The one connecting the outer circles represents the "schematic" meaning of *bite*, i.e. the fact that it relates two entities. The other one, connecting the active zones, specifies that the schematic meaning must be reoriented so as to involve specific subparts of the entities profiled by the nominal expressions *your dog* and *my cat*.

A similar situation obtains in the case of adverbial resultative sentences like (15a), *Sally painted the room beautifully*. As was pointed out above, the use of
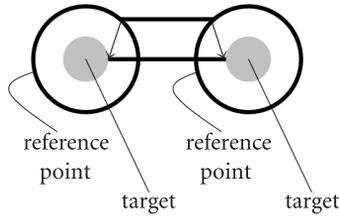
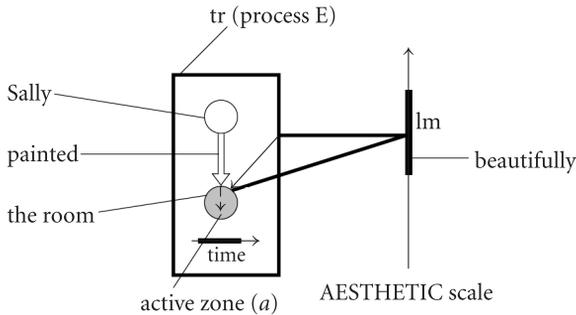**Figure 5.** Expanded representation for Figure 4a

Figure 6. The profile/active zone asymmetry for *Sally painted the room beautifully*

the adverb points to a form-meaning mismatch. Within Cognitive Grammar, such a mismatch can be detailed as follows. Formally (i.e. schematically), *-ly* adverbs profile a relation between a process (i.e. the trajector) and a region along a scale (i.e. the landmark). For example, in *She did it quickly*, a relation holds between the process of her doing something and a region along a scale indicating speed. In particular, the process is to be located in the region indicating higher than usual speed (with respect to some standard). From the point of view of meaning, it has already been observed that, in the case of (15a), the adjectival base of the adverb *beautifully* refers to one of the processual participants. Interestingly, such a participant can be regarded as an active zone with respect to the process since a participant is a subpart of an event by definition. Hence, the event can be taken as a reference point for accessing the participant and, ultimately, some of its properties. The situation is summed up diagrammatically in Figure 6, which must be analysed alongside Figure 5.

The emboldened horizontal line in Figure 6 (where for graphical reasons I have ignored the subjective axis relating the conceptualiser to the event) rep-

resents the schematic meaning of the adverb, i.e. a relation between a process, the trajector (drawn as the rectangular), and a region along a scale, the land-mark (indicated as the emboldened segment along the aesthetic scale). The emboldened slant line indicates that a relation obtains between the affected entity (represented as the shaded circle lying downstream with respect to the thick arrow standing for the energy flow and containing a broken arrow which indicates an ongoing change) and the relevant region along the aesthetic scale. The reference point ability has been diagrammed as the arrow connecting the processual trajector with the nominal active zone. Such an arrow (and hence the reference point ability) allows us to connect the schematic with the ori-ented meaning for the adverb *beautifully*. The reader can easily verify that the diagrammatic representation in Figure 6 is similar to the one in Figure 5.[14]

4.   Complementary asymmetries

After having shown that the use of adverbs involves property ascription by the conceptualiser and the reference point model, I would like to argue that indirect evidence supporting the proposed analysis comes from the Cog-nitive Grammar characterization of "raising" constructions (see Langacker 1999: Chapter 11). My claim is that the asymmetry observed in the adverbial resultative construction is the complement of the one proposed by Langacker (1999) for "raising" constructions. Hence, the same cognitive operations are involved in the two cases, the only difference lying in the choice of the trajector and active zone.

"Raising" constructions are sentences like (18b), which seems to be ob-tained from (18a) by moving *David* out of the subject position in the embed-ded clause into the subject position of the matrix clause (thus replacing the cataphoric pronoun *it*).

(18)   a.   It is likely that David will leave.
      b.   David is likely to leave.

Cognitive Grammar dispenses with movement operations and captures the similarity between (18a) and (18b) by relying on the profile/active zone asym-metry illustrated in the previous subsection. *Likely* in (18a) profiles a relation between a processual trajector (i.e. *that David will leave*) and a region along a scale indicating probability. In particular, the event denoted by the trajector is put in correspondence with a region indicating high probability of occurrence.
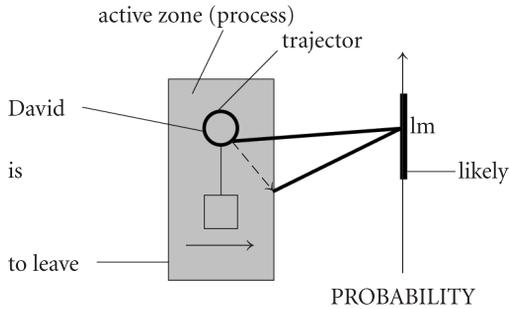
Figure 7. The Cognitive Grammar analysis of "subject raising"

In (18b), the trajector within the process of leaving (i.e. *David*) is profiled as the overall trajector (i.e. sentential subject). The process of David's leaving is still what is assessed for probability but is analysed as David's active zone, that is the (processual) entity with which David is associated. Such profile/active zone asymmetry is illustrated in Figure 7, which is to be contrasted with Figure 6 and Figure 5.

As Figure 7 shows, the trajector can be contained within an active zone in complementary fashion with respect to Figures 4a, 5, and 6. To put it differently, the asymmetry observed in adverbial resultative constructions is the opposite of the one implicit in (18b). In (15a), *Sally painted the room beautifully*, the process of Sally's painting the room is the overall trajector (by being the adverb's trajector). Still, *the room* can be said to be beautiful because *the room*, by virtue of its status as landmark within the clausal process (i.e. the room was the affected entity), constitutes an active zone with respect to it. In (18b), *David* is the overall trajector. Still, the process of David's leaving can be said to be likely because it constitutes an active zone with respect to him.

5.   Conclusion

This paper proposes that adverbial resultative constructions can be characterised in terms of property ascription by the conceptualiser (see Section 3.1) and the reference point ability (see Section 3.2), the latter accounting for the distinction between schematic and (object-)oriented meaning of resultative adverbs. The conceptualiser attributes a (gestalt) property P, such as *beauty* (see the contrast in (15) in particular), to an entity *a* by choosing the event E in

which *a* is involved as a reference point. On the other hand, adjectival resultative constructions are claimed to involve the cognitive model known as the billiard-ball model. Further, the distribution of adjectives in adjectival resultative constructions can be captured by way of the part-whole affectedness generalisation (as well as in terms of objective properties, see Note 12): only those adjectives are used which refer (if possible) to a property P that can be predicated of any arbitrarily chosen part of the affected entity *a* (see Section 2).

The identification of different cognitive processes for adjectival and adverbial resultative constructions (roughly, force construal vs. subjective property ascription) is a first step towards explaining the resultative "paradox" illustrated in Section 1. First, the non-perfect (i.e. colloquial) status of examples containing an adjective instead of an adverb (e.g. #*She fixed the car perfect*) may be due to the fact that the conceptual source for "true" adjectival resultative constructions, that is the billiard-ball model, requires part-whole adjectives (if possible) rather than adjectives involving subjective evaluation like *perfect*. Second, we observed that English allows both adjectival and adverbial resultative constructions whereas Romance languages like Italian do not (in general) have adjectival resultative constructions. The obvious conclusion to be drawn here is that Romance languages do not avail themselves of force construal for clause structuring purposes to the same extent as Germanic languages do. Of course, it remains to be explained why such typological differences occurred in the first place and why they still continue to hold. From the language user's point of view (i.e. within a usage-based model of grammar as outlined for example by Langacker 1999: Chapter 4), the different behaviour of English and Italian is not problematic since all grammatical constructions result from various (entrenched) construal operations. Obviously, various evolutionary accidents may cause languages to differ in their conventional construals (i.e. the entrenched schemas or constructions obtained through the use of certain construal operations), see Croft and Cruse (2004: 72–73). Hence, the challenge the cognitive linguist faces in order to shed further light on the resultative paradox resides in detailing the evolutionary path of resultative constructions, a task which, to the best of my knowledge, has not been undertaken yet. It may be important in this respect to observe that subjective property ascription (i.e. the cognitive mechanism underlying adverbial resultative constructions) has a much wider domain of application than force dynamics (e.g. it also accounts for depictive cases, see Section 3.1) and that the number of adjectival resultative constructions seems to have increased gradually over time (see Visser 1963: 582). This might mean that adjectival resultative constructions are a later development (interestingly,

some of Visser's resultative phrases are ambiguous as to the morphological distinction between adverbs and adjectives and contain resultative phrases like *smale* "small" which do not refer to part-whole properties). But a careful examination of what factors contributed to their rise and expansion (as opposed to the lack thereof in Italian) obviously lies outside the limited (synchronic) scope of the present paper and should be the subject of future research.

Notes

* My gratitude goes to two anonymous reviewers, who provided me with useful comments and suggestions. All errors are mine, of course.

1. The terminological distinction between resultative adverbial construction and resultative adverb is intended to underline the fact that there is no reason to postulate a resultative component in the meaning of the adverb independently of the resultative construction (i.e. *beautifully* does not mean that something becomes beautiful in the same way as the adjective *flat* does not mean that something becomes *flat*).

2. The reader should also observe, however, that colloquial adjectival examples can become entrenched and thus enter into the language as fixed expressions. This is the case, for instance, of the phrase *colour oneself beautiful* (used to refer to choosing the colour(s) of one's clothes so that one's appearance is greatly improved). Interestingly, the phrase seems to be originally American English as the following quotation from a British novel reveals (notice that both the British English and the American English spellings are used):

(i)   ('I'm taking you to have your **colours** done! And don't keep saying, "what", please, darling. **Color me beautiful**. I'm sick to death of your wandering round in all these dingy slurries and fogs [. . .]. (Helen Fielding, *Bridget Jones's Diary*, 1997: 130)

3. By this I mean that either construction can be related to some of the linguistic *construal operations* (or *conceptualisation processes*) which are part of general *cognitive processes* (i.e. attention/salience, judgement/comparison, perspective/situatedness, constitution/gestalt; see Croft and Cruse 2004: Chapter 3 for an overview). The two anonymous reviewers find this connection between processes and constructions "puzzling" and claim that it is not clear whether "processes" refer to on-line processing or not. However, in view of the cognitive linguistics equation between meaning and conceptualisation (i.e. linguistic codification, as well as decodification, is viewed as relying on the cognitive processes listed above), the link between processes and constructions should not be puzzling at all but rather be regarded as the norm. Further, whether such processes refer to on-line processing or not is possibly a matter of entrenchment (as well as other factors). For example, Italian speakers probably do not conceptualise bodily states as possession (cf. *Ho freddo*, literally "I have cold") since the relevant expressions are well-entrenched in the language and do not compete with alternative forms like English *I'm cold*, where no metaphorical mapping based on possession can be detected (see also Croft and Cruse 2004: 73). As for the resultative cases discussed here, I

do not see any problems in assuming that the cognitive operations to which adjectival and adverbial resultative constructions are linked do not only motivate the rise of such constructions in the first place (i.e. diachronically) but are also used by conceptualisers (i.e. speakers and hearers) for codification and decodification purposes (the discussion of (6) should be illuminating in this respect).

4. It is worth pointing out that intransitive resultatives can code causal relations (*contra* Rappaport Hovav and Levin 2001). In *The kettle boiled dry*, for example, *the kettle* became *dry* because the water in it boiled (for too much time).

5. The interested reader is referred to Broccias (2003) for a detailed analysis of this and similar schemas, which can be regarded as making up a network called the (English) change network.

6. The inclusion of the path at the expense of the source in the upper box also reflects the fact that the entities involved in a relation are always implied by the relation itself. That is, whereas we can think of entities independently of any relation in which they might be involved, relations always imply reference to (at least two) entities.

7. Observe that, if we adopt a blending analysis, force-construal can be seen as an instance of emergent structure in the blend.

8. One of the two anonymous reviewers does not agree with this analysis and observes that *cross* is not amenable to a force dynamics interpretation simply because it has a default sense of linear movement and lacks a sense of "contact". In other words, it neither codes affectedness in general (because "contact" is not a necessary feature of its meaning) nor complete affectedness in particular. The latter, as is explained in the text below, refers to the requirement that every part of the entity denoted by the direct object (i.e. *the field*) be affected by the action denoted by the verb. The reviewer also points out that, on the other hand, the verb *criss-cross* can be used in a resultative construction with *flat* because it signifies "to move back and forth or over", that is, it satisfies the complete affectedness requirement. However, even if one accepts this alternative analysis, it remains to be explained why verbs of movement such as *cross*, unlike non-movement verbs like *kiss* and *smoke*, cannot undergo force construal (i.e. why contextual clues cannot force such an interpretation upon the verb). Therefore, even if I do not disagree with the reviewer's analysis (in fact, I have explicitly recognised the absence of a "force component" in the meaning of *cross* in the text), I suspect that the whole issue might be more complex and that systemic interaction with other verbs (like *trample*) should not be excluded *a priori* (see also Broccias 2003: 308 on the need to evaluate the (im)possibility of grammatical constructions within a systemic view (or network model) of grammar). Needless to say, this problem needs further investigation.

9. Since I am ignoring colloquial usage here, I will use the diacritic "*".

10. Complete affectedness has been represented in Figure 1 by inscribing the theme circle within the target circle. This is intended to show that every part of the theme can be described as being in the state the target circle stands for.

11. It can be easily shown that the part-whole affectedness generalisation also covers intransitive examples such as *The pond froze solid*. Intransitive cases can usually (see Broccias 2003: Chapter 6 for some apparent exceptions) be regarded as instantiations of a schema

(called the Event Change Schema in Broccias 2003) which originates, like the Force Change Schema, from the merger of an event component and a change component. The difference between the two schemas amounts to the fact that the event component in the former, unlike in the latter, resists force dynamics construal. In the example given above, for instance, *the pond* cannot be construed as a manipulator since it refers to an entity undergoing a change (i.e. freezing). That is, the Event Change Schema can be taken as the complement of the one appropriate for transitive cases. It only deals with those scenarios that are not filtered out by the Force Change Schema. It follows, therefore, that the billiard-ball model, albeit derivatively, is also relevant to the description of intransitive resultative structures. Hence, the part-whole generalisation should also hold in such cases. Indeed, in *The pond froze solid*, *solid* can be predicated of any part of *the pond*, whereas, colloquial usage aside, **The pond froze beautiful* is deviant because the adjective *beautiful* refers to a gestalt property.

12. In this sense, *sore* can be classified as an objective adjective since it does not involve what Cognitive Grammar calls the subjective axis (see also below in the text on this notion). The fact that adjectives in resultative constructions refer to objective properties of affected entities is labelled *objective affectedness generalisation* in Broccias (2003: 166–171). Such a generalisation frequently overlaps with the part-whole affectedness generalisation (but see Broccias 2003: 169 for some cases where only the former applies).

13. The relation between the direct object's referent and the adjectival base of the adverb cannot always be expressed by way of the *NP is Adjective* construction (e.g. *The room is beautiful* from *Sally painted the room beautifully*). Sometimes a different paraphrase is needed, e.g. *The soldier is in a bad condition* from *The soldier was wounded badly*. This, of course, is not a problem since I am talking about a conceptual relation by which a property metonymically evoked by the adjectival base applies to the direct object's referent. How this relation can be instantiated linguistically (i.e. in terms of form) is another matter.

14. As was the case with intransitive adverbial resultative constructions, the analysis proposed here for transitive adverbial resultative constructions also applies to intransitive cases. In *The pond froze beautifully*, for example, *beautifully* evokes a subjective property (i.e. beauty) and is "licensed" by the reference point ability. The conceptualiser makes use of the whole event, the event of freezing, to target the entity undergoing a change (*the pond*) for subjective evaluation purposes.

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