

Determining the Productivity of Resultatives:  
A Reply to Goldberg & Jackendoff

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1. Introduction. Goldberg and Jackendoff (2004) present an analysis of English resultative constructions, which incorporates corpus data presented in Boas (2003). While Goldberg & Jackendoff (henceforth: G&J) offer an interesting account, their paper has a number of problems that I believe need clarification in order to avoid any misconceptions that readers of *Language* might arrive at about my own work. The goal of this paper is to discuss a number of empirical as well as theoretical issues that were incorrectly cited, misrepresented, or left out by G&J. To set the stage for the remainder of this paper, the second section corrects a number of inaccurate citations by G&J, which may lead to confusion when one attempts to locate examples in Boas (2000b, 2003). The third section sorts out a few factual inaccuracies that occur in G&J's paper. Finally, the remainder of the paper examines some theoretical claims made by G&J, comparing and contrasting them with the results presented in Boas (2003), and which, in my view, are not adequately represented by G&J.

2. Incorrect References and Citations in Goldberg & Jackendoff (2004). The reference listed by G&J (2004: 565) as Boas (2000): 'Resultatives at the crossroads between the lexicon and syntax' is referred to at various points throughout their paper. However, none of the data or results attributed to the paper listed by G&J as Boas (2000) are found in this paper, possibly leading to confusion in a reader's search for them.<sup>1</sup> In fact, most of the data cited by G&J actually occur in a different work. To avoid further confusion, I will from now on refer to the 'Resultatives at the crossroads between the lexicon and syntax' paper as Boas (2000a), and to my dissertation 'Resultative Constructions in English and German' (where most of the data to which G&J refer are to be found) as Boas (2000b).

The reference listed by G&J (2004: 565) as Boas (2003) appears with the incorrect title, namely ‘Resultative Constructions in English and German.’ The correct title of Boas (2003), which appeared as a substantially revised version of my dissertation (Boas 2000b) is ‘A Constructional Approach to Resultatives.’<sup>2</sup> Having clarified the status of the different titles of my works, I now address some factual inaccuracies in order to correct any misconceptions one might have about Boas (2000b, 2003) as a result of reading G&J’s paper.

3. Factual Inaccuracies in Goldberg & Jackendoff (2004). In addressing the issue of the productivity of resultative constructions, G&J (2004: 558-563) use corpus data presented by Boas (2003). While referring to the corpus of more than 6000 resultative sentences collected from the British National Corpus (BNC), G&J make incorrect claims about the size of the BNC, which – as we will see in section 4 – has important ramifications for their analysis as well as their presentation of the account developed in Boas (2003). For example, on p. 559 the authors write: ‘In Boas’s (2003) search of the 10-million-word British National Corpus, ...’ A similar statement occurs on p. 562, where G&J point out that ‘...there are many verbs that occur only once in the 10-million-word corpus...’ and ‘...a particular verb appears only once in a 10-million word corpus ...’ The problem with these statements is that they are incorrect. In Boas (2000b: 21) and Boas (2003: 1) the correct size of the BNC is stated as 100 million words.

Another issue relating to the Boas (2003) data cited by G&J concerns inaccurate statements about the source of the corpus data. For example, G&J (2003: 559) claim: ‘In Boas’s (2003) search of the 10-million-word British National Corpus, some adjectives such as wet, sleepy, brown, dirty, for example, appeared as RPs but only with lexical resultative verbs.’<sup>3</sup>

While Boas (2003) includes corpus data about the distribution of wet, sleepy, and dirty, it does not include corpus data on brown. I do not know how this data could have been attributed to me as a discussion of brown does not occur in my work.<sup>4</sup> Having cleared up these factual inaccuracies, I now turn to an examination of some of G&J's theoretical conclusions and compare them to the findings presented by Boas (2003).

4. How productive are resultatives? The first point I would like to discuss is G&J's claims about the productivity of resultative constructions. At issue is the question of what types of rules or schemas one has to propose in order to accurately account for the distribution of resultatives.<sup>5</sup> In other words, 'productivity is a matter of how available a pattern is for the sanction of novel expressions' Langacker (2000: 26). As such, an adequate account of resultatives should in principle include mechanisms that capture the knowledge needed to understand and generate sentences such as Jerry danced himself to exhaustion or Nancy talked herself hoarse while at the same time ruling out sentences such as \*Jerry danced himself exhausted or \*Nancy talked herself to hoarseness. At the same time, such an account should also be capable of explaining how language users understand and generate novel argument structures in sentences such as Frank sneezed the tissue off the table (Goldberg 1995: 152) where a syntactic pattern is extended to a verb that for a large part of the population is typically not associated with such a pattern.<sup>6</sup>

G&J state that there is 'a great deal of idiosyncrasy involved in resultatives. Many idiosyncratic instances and small subclasses of the construction must be learned and stored individually' (2004: 532). Based on corpus data (2004: 559), which are drawn from Boas (2003),

they go on to point out that ‘[w]hat we find are areas of productivity with many diverse pockets of idiosyncrasy’ (2004: 558). While I agree in principle with G&J’s view regarding the idiosyncrasy of resultatives, there are a number of points where I disagree with them.

Although G&J rely on my corpus data in constructing their argument about the productivity and idiosyncrasy of resultatives (2004: 558-563), they do not adequately present my previous account of resultative constructions, which spans over 200 pages. That is, the only part of my analysis of resultatives mentioned in detail by G&J consists of one sentence taken out of context: ‘In order to be able to describe which senses of a verb may occur with a specific semantic and/or syntactic type of result phrase, we must encode this information in the event-frames representing the individual senses of the verbs. (2000: 301)’ (G&J 2004: 562).<sup>7</sup> Based on this quote as well as a limited set of corpus data from Boas (2003), G&J claim that ‘Boas (2000, 2003) takes the implications of the semi-idiosyncrasy of the resultative too far’ and point out that ‘[w]e believe his own corpus data indicate that the construction is in fact partially productive [...]’ (2004: 562). This leads the authors to the conclusion that ‘[w]e wish simply to acknowledge that resultative constructions are partially, but not fully productive.’<sup>8</sup> Without further information, one is left with the impression that the analysis presented in Boas (2003) has no more to say about the idiosyncrasy and productivity of resultatives than what is mentioned by G&J.

However, this is not the case. Two of the main conclusions previously arrived at by Boas (2003) are almost identical to the results claimed by G&J (2004), namely that English resultatives (i) are idiosyncratic (although Boas (2003) proposes a higher degree of idiosyncrasy),<sup>9</sup> and (ii) are partially productive, although to a much lesser extent than claimed by G&J (see Boas 2003: 260-277).<sup>10</sup> Since G&J cite corpus data from Boas (2003), but leave out

several of the major theoretical results presented there, I present a very brief summary of the most relevant points before comparing the differences between G&J's account and the one I present in Boas (2003).

Based on an investigation of the distribution of more than 6000 resultative sentences in the BNC, Boas (2003: 23-118) demonstrates that particular senses of verbs subcategorize for distinct semantic and/or syntactic classes of resultative phrases and distinct semantic classes of postverbal NPs. Following ideas put forward by other usage-based models (e.g. Leisi 1954, Firth 1957, Langacker 1988, Fillmore 1989, Goldberg 1995, Bybee 2001), I argue that resultatives should be grouped into two main classes, namely conventionalized resultatives and non-conventionalized resultatives (Boas 2003: 119-158).<sup>11</sup> This lexical-constructional approach differs from other constructional approaches such as Goldberg (1995) and G&J (2004) in that it does not rely on independently existing 'meaningful constructions as items stored in the lexicon' (G&J 2004: 534) in order to explain the distribution of resultatives.

In my view, each conventionalized resultative is licensed by a particular sense of a verb, which I call a mini-construction. Adopting the main ideas of Frame Semantics (Fillmore 1982, Fillmore & Atkins 1992) mini-constructions are formalized in terms of event-frames which each impose their own semantic, pragmatic and syntactic selection restrictions (Boas 2003: 159-214).<sup>12</sup> Event-frames consist of source, path, and goal slots, which subcategorize for the types of event-participants (comparable to semantic roles or frame elements (cf. Fillmore et al. 2003)) and the different types of temporal, spatial, and force-dynamic relationships (cf. Talmy 2000) holding between them (Boas 2003: 173-181). To illustrate, consider the following simplified event-frame representing the end state (the goal time slot) of a prototypical painting activity.<sup>13</sup>

(1) Event-based frame semantic representation of the prototypical sense of paint including world knowledge (W)

GOAL
Ag (W p2) Pt (p3)

Ag: Entity applying paint to a surface

Pt: Surface or object that is construed as exhibiting a surface

p3: SYN: AP or NP

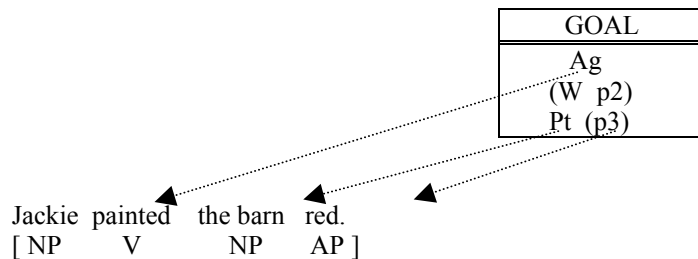
SEM: denoting a color or a property associated with the prototypically intended end result of applying paint to a surface

(Boas 2003: 224)

The event-frame representing the prototypical sense of to paint includes semantic and pragmatic selection restrictions about the Agent (Ag), the Patient (Pt), and possible end result states (p2, p3). As the specification for p3 illustrates, event-frames may also subcategorize for specific lexical/phrasal categories of resultative phrases. In the case of paint, this range is limited to NPs (e.g. a light shade of blue) and APs (e.g. red).<sup>14</sup> Optional elements are in brackets, which means that the end result specification (p3) of the patient (Pt) in (1) is optional. W is a diacritic that stands for all the world knowledge that speakers associate with prototypical painting events (see section 6 and Boas (2003: 181-192, 224, 256-259)).<sup>15</sup> Using a set of general linking conditions (2003: 290, 244), information contained in the event-frames is mapped to the syntactic level.



(2) Perspective of the prototypical sense of paint (cf. Boas 2003: 257)



In (2), the event-frame licenses the sentence Jackie painted the barn red: the Agent is mapped to subject position, whereas the Patient is mapped to Object position. The optional end result state is realized as a resultative phrase.<sup>16</sup> Note that this is just one of several event-frames related to paint (i.e., the prototypical sense). Other event-frames associated with paint denote different semantic concepts and thus contain different types of frame-semantic information (see Boas 2003: 200-205).<sup>17</sup>

This usage-based bottom-up approach differs from G&J's (2004) broad-scale generalizations in that it offers a more fine-grained analysis of the relations holding between the matrix verb and its arguments.<sup>18</sup> The event-frames for the conventionalized resultatives are based on data extracted from the BNC and make it possible to describe and (to some degree) predict the distribution of the respective verbs in resultative constructions (see specifically Boas 2003: 181-259).<sup>19</sup> On this view, resultatives that are attested in the BNC are regarded as conventionalized and can therefore be represented in terms of event-frames.<sup>20</sup> Another advantage of explicitly stating the semantic, pragmatic, and syntactic selection restrictions of resultatives as a part of conventionalized event-frames is that there is no need in my approach for compositional mechanisms (such as meaningful constructions whose semantics need to fuse with a verb in order to license resultatives, cf. Goldberg (1995)), to account for their distribution. My detailed

lexical semantic description and analysis of a verb's different senses enables us to arrive at a more fine-grained system that makes it possible to account for the various idiosyncratic distributions exhibited by verbs in resultative constructions.

G&J view this type of analysis as 'an approach that disallows any degree of productivity' (2004: 562). However, this is emphatically not the case. In Boas (2003: 260-277), I give an in-depth account of the productivity of novel resultatives. Since this important part of my analysis is not mentioned by G&J (leading them to claim that I 'take the implications of the semi-idiosyncrasy of the resultative too far' (G&J 2004: 562).), I now give a brief outline of the analysis of novel (or: nonconventionalized) resultatives in Boas (2003).

There I show that there are isolated pockets of productivity that allow for the formation of novel resultatives, also known as non-conventionalized resultatives. Based on data on the distribution of air emission verbs, I present a case study in which I argue that, in contrast to conventionalized resultatives such as Tom blew the napkin off the table, non-conventionalized resultatives such as Tom sneezed the napkin off the table have a different type of communicative function.<sup>21</sup> They serve to perspectivize a non-prototypical event participant that lies outside of the prototypical event-scene described by the respective target event-frame (the prototypical outcomes of sneezing events do not typically include the moving of objects). I claim that these cases are licensed by analogical association with an existing conventionalized mini-construction (Boas 2003: 260-277). More specifically, a so-called target-event frame (e.g., prototypical sneeze) is associated with a novel syntactic frame [NP V NP PP] that is capable of overtly realizing the non-prototypical event participant as well as its result state. This analogical process, however, is only possible if the target event-frame (e.g. sneeze) shows a certain semantic and pragmatic overlap in frame semantic information with a source event-frame (e.g. blow) that is

already conventionally associated with the novel syntactic frame, in this case [NP V NP PP] (for more details, see Boas 2003: 316-317).<sup>22</sup>

In order to license an analogical association of the target event-frame (sneeze) with the form-meaning pairing of the source event-frame (blow), it is also necessary to have context provide additional information. This information makes it possible to interpret the event-based frame semantic information of the target event-frame in terms of the event-based frame semantic information of the source event-frame.<sup>23</sup> As the following sentences illustrate, the force-dynamic and temporal relations holding between the event participants of the target-event frame (sneeze) are construed according to the force-dynamic and temporal relations holding between the event participants of the conventionalized source event-frame (blow) if the association is to take place.

- (3) a. Lars {blew/sneezed} the napkin off the table. (cf. Boas 2003: 271)  
b. ??Lars {panted/wheezed} the napkin off the table.

The analogical association fails to take place if (i) the force-dynamic relations holding between the Agent and Patient of the target verb (sneeze) cannot be construed according to those holding between the Agent and Patient of the source verb (blow) (for more details, see Boas 2003: 270-273), and (ii) if there is not enough contextual background information providing that sort of information (for details, see Boas 2003: 269-277).<sup>24</sup> This analogical association crucially relies on the influence of contextual background information, which may in principle provide the necessary information that allows for such an association to take place.<sup>25</sup> For example, (3b) sounds less acceptable than (3a) because pant and wheeze inherently encode less of a forceful air emission than blow and sneeze. As such, there is less overlap between the semantics of pant (and

wheeze) and blow. This makes it more difficult for a speaker to create an analogical association between the meanings of the two verbs. However, when context provides information about a situation in which a person wheezes or pants in a way that goes beyond conventionally expected behavior (for example, when gasping for air because of a medical emergency), then (3b) sounds more acceptable (for details see Boas 2003: 274). When this additional information is provided by context, an analogical association may take place.<sup>26</sup> Our discussion shows that contrary to what G&J suggest, my analysis therefore does indeed allow for some degree of productivity while at the same time accounting for the idiosyncrasy of certain resultatives.<sup>27</sup>

My analysis differs from G&J's account in three main points. First, it views the notion of productivity in a different light. Because the BNC was chosen as a benchmark for the study of resultatives (it is a balanced corpus), all instances of resultatives found in that corpus are classified as conventionalized, i.e., the event-frame subcategorizes for a specific array of constituents and imposes selectional restrictions on them. On this view, it does not matter whether a given resultative occurs only once, or many times more. Second, resultatives such as Tom sneezed the napkin off the table that are not found in the BNC or elsewhere in dictionaries are classified as non-conventionalized and explained in terms of analogical extension.<sup>28</sup> G&J's (2004: 562) examples (90)–(96), which are classified as having a novel character, can, in principle, be accounted for in terms of analogical associations similar to the examples outlined above. Third, my account rules out unattested resultatives by (i) stating detailed selection restrictions for conventionalized resultatives, and (ii) offering a set of constraints that limit the production of non-conventionalized resultatives. Neither option seems to be offered by G&J, who posit a set of meaningful subconstructions and generalizations to 'show how these meanings predict many of the properties of resultative sentences' (G&J 2004: 538).

The proposal regarding different types of mini-constructions I put forward in Boas (2003) clearly runs counter to G&J's (2004) claim that 'the literature on the whole has treated resultatives as a unified phenomenon ("the resultative")' (G&J 2004: 535). In fact, in discussing the semi-productivity of resultatives, I have pointed out that it is necessary to 'shift the explanatory burden from the level of abstract constructional semantics to the level of concrete verbal semantics in order to be able to account for the distribution of resultative constructions that may occur with a given verb' (2003: 315). This observation has led me to posit distinct mini-constructions for each sense of a verb. Closely related to the problem of productivity is the question of how to delimit the syntactic and semantic range of postverbal arguments in resultative constructions. At issue is the question of how to capture the idiosyncratic distribution of postverbal constituents in sentences such as That really drove Jana {crazy/\*to craziness}, Heiko danced himself to {to exhaustion/\*exhausted}, Karen painted the house {red/\*liquid}, and \*Inge talked herself {hoarse/\*into the room}.

5. The influence of world knowledge on collocational restrictions. G&J propose that 'the distribution of resultatives is also constrained by general effects of world knowledge as it relates to the semantics of resultatives' (2004: 546). The authors discuss the distribution of so-called fake reflexives (Bill cried himself to sleep vs. \*Bill cried Sue to sleep (2004: 546)) and come to the conclusion that the distinction 'requires no grammatical stipulation because it arises from our world knowledge of what is likely to cause what' (2004: 546). While I agree in principle with their observations vis-à-vis fake reflexives I have previously shown that there are more systematic influences of world knowledge on the distribution of resultatives. This insight has led

me to offer a more principled explanation of the influence of world knowledge on resultatives that is not mentioned in G&J's discussion. Because of limited space, I can only give here a brief outline of the influence of world knowledge on the distribution of resultatives as presented in Boas (2003).

In short, I show that there is a direct link between conventionally expected result states and collocational restrictions on the postverbal constituents in resultatives.<sup>29</sup> The unified approach towards lexical description (Fillmore 1982, Langacker 1987, Geeraerts 1994, Croft 2000, Inchaurrealde 2000) claims that it is impossible to partition linguistic and encyclopedic knowledge into two distinct realms. I modify this approach by proposing that there exists a meaning continuum with two opposite ends, namely the encyclopedic end and the lexical end (Boas 2003: 168-169). On this view, the total meaning of each verb consists of (at least) two parts, one tending towards the lexical, the other towards the encyclopedic pole of the continuum (Boas 2003: 170-171). Lexical information (or linguistically immediately relevant information) is called 'on-stage information' and includes all of the information encoded in event-frames such as in (1) above except for world knowledge. In contrast, encyclopedic information is called 'off-stage information' and includes general world knowledge ('W' in (1)) as well as knowledge about the types of conventionally expected results of activities ('(p2)' and '(p3)' in (1)). The combined meaning contributed by each of the two meaning parts to the overall interpretation of a word crucially depends on the context in which the word is used. Event-frames differ in how much access to off-stage information they allow. Depending on the context, the licensing of a particular construction as well as its interpretation may require different amounts of 'on-stage' and 'off-stage' information (Boas 2003: 171-173).

To illustrate, the prototypical senses of verbs such as kill, paint, and wash require very little off-stage information outside of resultative constructions because they imply specific types of conventionally expected outcomes (e.g. Nancy killed Ben, Collin painted the house, Miriam washed the sweater). When these verbs occur in resultative constructions, they typically impose tight collocational restrictions on their postverbal constituents. An example of an extremely restricted verb is kill, which licenses resultatives emphasizing the prototypical outcome of an event. This verb does not allow any recruitment of off-stage information (this is encoded in the event-frame for kill, cf. (Boas 2003: 221)) and may only appear with dead (Nancy killed Ben dead).<sup>30</sup> Paint and wash, which license resultatives rendering a vague endpoint of an event more precise also exhibit collocational restrictions on their postverbal constituents by requiring them to fall within a certain semantic range. For the prototypical sense of wash, restrictions on the Patient require that it be an object or area that is host to unwanted substances. The resultative phrase is typically restricted to (adjectival) phrases denoting a state of cleanliness (e.g. Miriam washed the sweater clean).<sup>31</sup> (Boas 2003: 225-226) Paint exhibits fewer collocational restrictions than wash (see (1) above): it allows both a wider syntactic range (both APs and PPs) and a wider semantic range (see (1)) of postverbal arguments, because prototypical painting activities have the potential for different types of results (e.g. red, very bright, a pale shade of green, waterproof, etc.) (Boas 2003: 224).

The differences between verbs such as kill, wash, and paint illustrate that the collocational restrictions exhibited by these verbs reflect the knowledge a speaker has about conventionally expected results of activities denoted by these verbs. The fact that the prototypical sense of kill expresses an activity that has a strictly pre-determined expected result and therefore requires no off-stage information is reflected linguistically by the fact that it only

allows one type of resultative phrase. In contrast, verbs such as prototypical paint or wash exhibit fewer collocational restrictions than kill.<sup>32</sup>

We now turn to resultatives that exhibit even fewer collocational restrictions than those with paint and wash. These are resultatives that are used to point out an unconventional perspective of an event (so-called fake object cases (G&J 2004: 546)), such as Jackie painted herself tired or Jackie painted the brush to pieces.<sup>33</sup> Such resultatives involve non-prototypical event participants and as such do not denote conventionally expected results that are directly inferable on the basis of on-stage information encoded in event-frames. Being tired or destroying tools are not prototypical outcomes of painting activities (Boas 2003: 259). These resultatives are licensed by event-frames such as paint in (1), which allows the recruitment of off-stage information (represented by ‘W’ in (1) above) in order to license non-prototypical event participants that differ from the prototypical Patient participant which typically undergoes a change of state or location in resultatives. In addition, off-stage information is recruited about possible end result states of each of the fake objects since they do not denote conventionally expected results (represented by ‘p3’ in (1)). More specifically, it is common knowledge that both the Agent and the Instrument may be affected as a result of painting activities: activities can lead to exhaustion of the Agent, using an Instrument repeatedly can lead to its disintegration.<sup>34</sup> The fact that more off-stage information is required to license non-prototypical event participants such as fake objects and their resultative phrase is reflected linguistically. Since more off-stage information is required, event-frames impose fewer collocational restrictions on postverbal constituents in resultatives with fake objects than in resultatives with regular direct objects (Boas 2003: 281).<sup>35</sup> This direct link between the influence of world knowledge on collocational restrictions is one of the major points made by Boas (2003), but overlooked by G&J (2004).<sup>36</sup>



Finally, non-conventionalized resultatives exhibit the least amount of collocational restrictions. Because they are formed by analogy on the basis of conventionalized resultatives in combination with contextual background information, they need to provide as much off-stage information as possible in order to be available for a potential analogical association. In the case of sneeze we have seen above that in order for the analogical process to take place, the speaker needs to know as much as possible about what it means to sneeze (e.g. entity that makes air move as the result of an involuntary and convulsive or spasmodic action (Boas 2003: 267)) in order to associate sneeze with the resultative semantics of blow, and, subsequently, with the syntactic frame [NP V NP XP] expressing the resultative semantics. This is because the resultative semantics does not describe a conventionally expected result of sneezing. The recruitment of off-stage information about what it means to sneeze therefore requires information not only about the prototypical event participants but also about non-prototypical event participants that lie outside of the scene described by the prototypical sense of sneeze. Here, non-prototypical event participants are objects that could possibly be moved by an air stream (Boas 2003: 281). While the range of postverbal arguments occurring with the nonconventionalized resultative sense of sneeze is constrained by the resultative event-frame of blow and contextual background information, it is nevertheless greater than that of intransitive sneeze, which does not allow postverbal NPs or resultative phrases.

Explicitly stating this link between world knowledge and collocational restrictions in resultatives goes a significant step beyond G&J's general claims about the role of world knowledge. Whereas G&J (2004: 546) offer an idea in terms of 'our world knowledge of what is likely to cause what', Boas (2003) attempts to find direct correlations for capturing the collocational restrictions of a range of different resultatives. In other words, the fact that more

off-stage information is recruited in order to license non-prototypical event-participants with sneeze is reflected linguistically by the fact that collocational restrictions of the prototypical sense of sneeze become less strict as to allow for postverbal constituents. This means that the large amount of off-stage information directly influences the range of possible postverbal constituents, or, in other words, that the fewer collocational restrictions directly reflect the large amount of off-stage information needed in order to license a resultative with sneeze (Boas 2003: 282).<sup>37</sup> Other types of nonconventionalized resultatives could in principle be formed with sneeze as long as there is a source event-frame and contextual background information capable of licensing the analogical process underlying resultatives such as Miriam sneezed the fly out of the cup, Collin sneezed his neighbors sick, Chuck sneezed his dog to madness, and Joe sneezed his keyboard wet (cf. Boas 2003: 282-283). Mechanisms similar to the one described here should in principle be capable of explaining the licensing of novel resultatives mentioned by G&J (2004: 562).<sup>38</sup>

In summary, the proposal put forward in Boas (2003) differs from that in G&J (2004) in that it details the importance of world knowledge in determining collocational restrictions. Stating this relation allows us to systematically account for the underlying mechanisms responsible for the different levels of idiosyncrasy and productivity found in resultative constructions.

6. Conclusions. I have pointed out some of the most important aspects of Boas (2003), which in my view are not adequately represented in G&J (2004). Furthermore, I have highlighted some of the key similarities and differences between the two approaches. They share many

aspects of the constructional view of language as outlined by G&J (2004: 532-535) and seem to agree on two fundamental facts with respect to English resultatives: (i) their distribution appears to be idiosyncratic, and (ii) they are partially, but not fully productive.

Despite a number of parallels, the two accounts differ significantly in how they try to explain these facts. G&J (2004) seem to adopt a modified version of Goldberg's (1995) constructional analysis of resultatives, which relies on 'meaningful constructions as items stored in the lexicon'. On this view, 'argument structure is determined by the composite effects of the verb and the construction' (G&J 2004: 534). While employing independently existing constructions may serve well to account for productive and semi-productive constructional patterns such as the ditransitive construction (Goldberg 1995) or the *way* construction (Goldberg 1995, Israel 1996), I have demonstrated that independently existing constructions are inadequate when it comes to explaining the distribution of resultatives (Boas 2003: 88-117). The main reason for this is that it is difficult to determine the exact circumstances under which a given verb may fuse with the resultative construction.

Although G&J offer a more detailed analysis including four related subconstructions, their account still faces in principle the same problems as Goldberg's (1995) original constructional analysis of resultatives, namely how to explain the types of collocational restrictions discussed in section 4 (see also Boas (2003: 119-318)). The four subconstructions (2004: 563) capture high-level generalizations about different semantic and syntactic relations found in conventionalized resultative constructions, but they do not seem to offer a fine-grained description about 'what the allowable forms and meanings of resultative sentences are in English' (G&J 2004: 564). Another problem is that in contrast to Goldberg's (1995) pioneering analysis in which an independently existing construction is capable of contributing

constructional roles to the semantics of the verb, thereby licensing novel resultatives such as Frank sneezed the napkin off the table (Goldberg 1995: 152), G&J do not seem to offer an explanation of how such novel (or nonconventionalized) resultatives are licensed. Note, also, that G&J do not mention how the production of novel resultatives may be constrained in principled ways.

The alternative proposal put forward in Boas (2003) differs from G&J's analysis in that it does not arrive at broad generalizations about semantic and syntactic argument structures, aspectual structures, or temporal relations in resultative constructions. As the distribution of more than 6000 resultatives from the BNC investigated in Boas (2003) demonstrates, the degree of idiosyncrasy is so high that such generalizations do not seem to be of any explanatory power when describing and predicting the distribution of resultative constructions. This does not mean that G&J's generalizations are unfounded. But it suggests that they are of little value when it comes to providing a fine-grained account capable of accounting for the distribution of resultatives (see also Boas 2003: 134-145), especially when it comes to capturing collocational restrictions imposed by the main verb.

For these reasons I distinguish between conventionalized and nonconventionalized resultatives. The semantics of verbs that appear in conventionalized resultatives are formalized in terms of event-frames that capture all of the relevant semantic, pragmatic, and syntactic properties needed for accounting for the distribution of a given verb in resultative constructions. My approach is compatible with G&J's proposal in that 'many idiosyncratic instances and small subclasses of the construction must be learned and stored individually' (2004: 564). However, in contrast to G&J's analysis, my account offers a fine-grained study of important collocational

restrictions for different classes of resultatives that makes it possible to predict (to a certain degree) the range of resultative patterns in which a verb may occur.

Boas (2003) also differs from G&J in that it offers an account of ‘pockets of productivity’ (G&J 2004: 564). Based on a detailed study of different air emission verbs, I illustrate the different linguistic and non-linguistic factors responsible for licensing nonconventionalized (or novel) resultatives. By relying on analogical association as one of the main factors that determine the distribution of nonconventionalized resultatives, I make use of the general mechanism of analogy that is well known for operating in other linguistic and cognitive domains (e.g. Anttila 1977, Vosniadu and Ortony 1989, Janda 1996, Winters 1997). This means that contrary to G&J’s (2004: 564) claim that ‘something must be stipulated in order to equip English with resultative sentences,’ my alternative account does not require special mechanisms such as independently existing constructions to account for the distribution of resultatives.<sup>39</sup> At the same time, Boas (2003: 269-277) systematically limits the productivity of resultatives by proposing a number of significant constraints to rule out unacceptable nonconventionalized resultatives. To summarize, I believe that the detailed analysis presented in Boas (2003) holds more promise than G&J’s (2004) generalizations when it comes to fulfilling the main goal of a theory of resultatives: ‘the grammar (...) must predict what the allowable forms and meanings of resultative sentences are in English’ (G&J 2004: 564).

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<sup>1</sup> For example, on p. 560 G&J attribute sentences (81a,b) to Boas (2000: 257). These sentences are not located in the paper listed in G&J's reference section as Boas (2000). Similar observations hold for the quote attributed by G&J to Boas (2000: 301) on p. 562, and for footnote 9 on p. 539, among other citations.

<sup>2</sup> This confusion makes it difficult to locate relevant data cited by G&J in the original texts. For example, sentence (79) (G&J 2004: 560) is attributed to Boas (2003: 257), but it actually is in Boas (2000b: 257).

<sup>3</sup> 'RP' stands for resultative phrase.

<sup>4</sup> Similar misrepresentations occur elsewhere in G&J's paper. In example (72), the authors include 'straight, brown, thick, and rough' as RPs that are 'drawn from Boas' Appendix A, which enumerates which verbs appear with which RPs' (G&J 2004: 559). However, Appendix A of Boas (2003: 321–340) does not include the RPs straight, brown, thick, and rough.

<sup>5</sup> Even more important is the question of how to constrain the application of such rules and schemas in order to prevent them from generating unacceptable sentences. For more details, see Langacker (2000: 21-32) for issues relating to compositionality, regularity, productivity, and distribution.

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<sup>6</sup> It is often difficult to determine whether a given verb is conventionally associated with a specific syntactic frame. The fact that a novel-sounding form-meaning pairing does not occur in large corpora or dictionaries is a good indication that it is not yet conventionalized as such (see also Boas (2003: 11-18) for problems surrounding the collection of resultative data). In fact, this is expected with novel expressions such as Frank sneezed the tissue off the table where a specific form-meaning pairing is productively extended to a verb. As Anttila (1989: 106) puts it: ‘Productivity involves extension of items in connection with the regular patterns of the grammar, and this is in effect creation, indispensable in speech activity.’ Syntactic productivity is parallel to morphological productivity in that it refers to the likelihood that a constructional pattern will apply to new forms (cf. Bybee (1995: 430), Bybee and Thompson (1997: 384)). As such, there are two notions of syntactic productivity: (i) The application of a syntactic pattern to create new instances of already existing syntactic patterns, and (ii) The extension of a syntactic pattern or argument structure to new verbs (cf. Barðdal 2004 and Langacker 2000). To test whether Frank sneezed the tissue off the table is an acceptable sentence in English, I conducted a survey among 210 undergraduate students at the University of Texas at Austin in February 2005. The students were given 23 sentences (17 resultative sentences, 7 non-resultative sentences) and asked to rank them on a 5-point scale, with (1) being the most acceptable and (5) being the least acceptable. 13 students classified Frank sneezed the tissue off the table as (1), 33 marked (2), 24 marked (3), 48 marked (4), and 105 marked (5). While this survey is limited in design and scope, it strongly suggests that for the majority of participants Frank sneezed the tissue off the table is towards the non-acceptable end of the acceptability continuum. This indicates that sneeze is not (yet) conventionally associated with the [NP V NP PP] frame for the majority of the population.

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<sup>7</sup> The quote given by G&J (2004: 562) refers to Boas (2000b) (my dissertation) and includes an error. Boas (2000b: 301) says ‘resultative’ instead of ‘result’.

<sup>8</sup> Considering the actual size of the British National Corpus (100 million words instead of 10 million words, as claimed by G&J (2004: 559, 562)), the so-called partial productivity attributed to the resultative construction by G&J is even smaller. That is, if awake occurs in a corpus of only 10 million words as a resultative phrase only once with eleven distinct singleton verbs, its frequency is much higher than if it occurs as a resultative phrase only once with eleven distinct singleton verbs in a corpus of 100 million words. Another important point to consider is the fact that the corpus data in Boas (2003) also include the total number of matches (both non-resultative and resultative) in the British National Corpus for all words occurring as resultative phrases. For example, awake occurs as a resultative phrase once with eleven distinct singleton verbs in the British National Corpus. The total frequency of awake in the corpus is 1379 (Boas 2003: 322). In contrast, black occurs as a resultative phrase once with five distinct singleton verbs in the corpus. However, the total frequency of black in the corpus is 19222 (Boas 2003: 322). These facts illustrate that it is necessary to take a closer look at the relationship between frequency and total matches in the corpus before making any claims about the ‘productive uses of RPs’ (G&J 2004: 562). These relativized numbers demonstrate that the degree of partial productivity of resultatives is in fact much smaller than claimed by G&J. For a method of calculating such frequencies see Gries and Stefanowitsch 2004.

<sup>9</sup> The following examples illustrate the idiosyncratic distribution of resultative phrases (for postverbal NPs, see Boas (2003: 120)). Examples are from Boas (2003):

- (i) And it seemed he was intent on driving her {crazy/\*to craziness/\*happy}.
- (ii) Nomo walks himself {to death/\*dead}.

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- (iii) Hargreave wiped his plate {clean/\*to cleanliness}.
  - (iv) She shattered the vase {to pieces/\*broken}.
  - (v) Jonathan painted the house {red/?rusty/\*expensive}.
  - (vi) He laughed himself {out of a job/\*jobless/\*unemployed}. (cf. Verspoor 1997: 119)

<sup>10</sup> Related observations have been made by Goldberg (1995: 120-140, 197). See also Boas (2003: 117). The following examples illustrate the partial productivity of resultatives: Only certain verbs allow novel resultatives, but not other verbs that are closely related in meaning:

- (i) Evin {talked/?spoke/\*whispered/\*giggled} herself hoarse.
- (ii) Pam {sneezed/?exhaled/\*snorted/\*wheezed} the napkin off the table.
- (iii) The audience {laughed/?giggled/\*pouted} the poor guy off the stage. (cf. Boas 2003: 121)

<sup>11</sup> There are three main criteria for classifying a resultative as conventionalized: First, its distribution can typically not be accounted for in terms of more general principles of the language. More specifically, a pattern is conventionalized if we do not find ordinary compositional processes that allow us to generate the meaning and form of that pattern based on already existing constructions. (Cf. Boas 2003: 140) Second, we find in the corpus verbs that are closely related in meaning, but cannot occur in a resultative pattern. Or, verbs belonging to the same semantic class exhibit different collocational restrictions, which make it difficult to arrive at a unified analysis that captures the relevant generalizations (cf. Boas 2003: 100-116, 124-145, 192-211). Third, if we find an instance of a verb in a resultative pattern and the majority of a set of native speakers accepts it readily, a resultative may be classified as conventionalized. Note, however, that there does not seem to exist an exact set of criteria that may be used to precisely determine the boundary between conventionalized and nonconventionalized resultatives. This,

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however, is in fact expected if one subscribes to the notion of fuzzy boundaries and prototype effects in language (cf. Wittgenstein 1953, Rosch 1973, Lakoff 1987, among others) (Boas 2003: 129) For details regarding problems with collecting data on resultatives see Boas (2003: 11-18).

<sup>12</sup> ‘The central idea of Frame Semantics is that word meanings must be described in relation to semantic frames – schematic representations of the conceptual structures and patterns of beliefs, practices, institutions, images, etc. that provide a foundation for meaningful interaction in a given speech community’ (Fillmore et al. 2003: 235). For a comprehensive overview of Frame Semantics, see Petrucci (1996). For a summary of the main ideas of Construction Grammar, see Östman & Fried (2004). For an overview of different types of usage-based models, see Barlow & Kemmer (2000).

<sup>13</sup> The event-frame in (1) is a simplified version of a more complex formalized event-frame that has various time slots: A path slot, a goal slot, and various path slots in between. Each time slot specifies the spatial and force-dynamic relations holding between the event participants (Ag, Pt, etc.) (see Boas 2003: 173-183). Since the end of an activity represents the relevant time slot for resultatives, our discussion here focuses on the goal time slot.

<sup>14</sup> Other types of event frames may be more restrictive, limiting the range of possible RPs to only one category, or only one type of RP (e.g. to blow out where the event-frame specifies out as the only permissible RP) (Boas 2003: 237-238).

<sup>15</sup> Event-frames differ with respect to whether they allow access to additional world knowledge (a.k.a. off-stage information). See section 4 below.

<sup>16</sup> Note that the information contained in event-frames is lexical default information, i.e., it must be embedded in discourse and made sensitive to contextual background information. As such, it is subject to override in cases in which specific contextual background information may license

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different types of postverbal constituents (e.g. She wiped the table dirty where the resultative phrase does not denote a prototypical outcome of the removal sense of wipe). For more details, see Boas (2003: 206-211) for a discussion of ‘removal of unwanted substances’ verbs. For the influence of contextual background information on the licensing of resultatives, see Boas (2006).

<sup>17</sup> Boas (2003) follows a splitting approach to lexical description. See Boas (2003: 175).

<sup>18</sup> Based on the corpus data investigated in Boas (2003), it appears as if very few generalizations are to be made about the distribution of resultatives, which is why a fine-grained encoding in terms of collocational restrictions is necessary (see section 4). This does not mean that there are no generalizations at all to be made. However, most generalizations turn out to have many exceptions, that is to say that they only represent tendencies instead of clear-cut generalizations (see Boas (2003: 202-205)). For example, the distribution of death and to death with verbs of killing depends on the semantics of the verb: ‘There seems to be strong tendency for verbs denoting punctual events to occur with adjectival resultative phrases, e.g., Kim shot Pat dead). In contrast, verbs denoting an iterative process overwhelmingly prefer prepositional resultative phrases (e.g. Kim stabbed Pat to death). While these are strong tendencies, they are not exact predictions about the type(s) of resultative phrase(s) that will occur with a verb’ (Boas 2003: 132, fn. 12). For a more general constraint, see Goldberg (1995: 195).

<sup>19</sup> For example, the selection restrictions of the event-frame of hammer specify that the resultative phrase be an AP, and that it has to denote ‘a state of flatness or other state that can be construed as being directly caused by the energy emitted by the agent’ (Boas 2003: 227). This specification rules out unacceptable resultatives such as \*Niko hammered the metal {to flatness/to thinness/heavy/dead}. Similarly, the selection restrictions of other event-frames do not allow specific senses of verbs to participate in resultative constructions, thereby ruling out



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resultatives that are typically not acceptable. The following examples illustrate that certain verbs may occur in resultatives, but other verbs that are closely related in meaning may not (although contextual background information may provide sufficient information to license resultatives that may otherwise be unacceptable, see Boas (2003: 270-277) and Boas (2006)).

- (i) Stefan {ate/\*chewed/\*devoured/\*swallowed} his plate clean. (cf. 2003: 114)
- (ii) The audience {laughed/?smiled/\*pouted} the poor guy off the stage. (cf. 2003: 111)
- (iii) Pam {sneezed/?wheezed/\*exhaled/\*snorted} the napkin off the table. (cf. 2003: 121)

<sup>20</sup> See also footnote 11 above. See Meyer (2002) for the importance of using balanced corpora such as the BNC for linguistic research.

<sup>21</sup> The fact that blow occurs many times with the [NP V NP PP] frame in the BNC strongly suggests that it is conventionally associated with this frame. Also, its first attested usage with this meaning and syntactic frame is 1382, according to the OED. (See Boas 2003: 266) In contrast, sneeze cannot be found with the [NP V NP PP] syntactic frame in the BNC or in the OED, which indicates that it is not (yet) conventionalized as such for a large enough number of English speakers.

<sup>22</sup> Analogy has been recognized for a long time as playing a crucial role in what has been called ‘morphophonemic conditioning’ of sound change (Wheeler 1887, Hermann 1931, Anttila 1977). Analogy has also been shown to drive syntactic change (Anttila 1989: 102-103).

<sup>23</sup> This might include various sorts of contextual background information, including visual information.

<sup>24</sup> Analogical association is blocked when certain event-frames lexically block any type of semantic and syntactic extension that would result in their acquiring a new syntactic frame

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(reflecting a new meaning) (Boas 2003: 317). See Boas (2003: 274-276) for a discussion of the syntax and semantics of exhale and inhale.

<sup>25</sup> In this case, context would provide information about the different types of event participants and their relations to each other.

<sup>26</sup> Explaining the distribution of non-conventionalized resultatives in terms of analogy based on existing conventionalized resultatives also explains their limited productivity. As Anttila (1989: 104) points out: ‘New analogical (deductive) forms are, by necessity, tied to speech production; that is, a speaker must utter them according to his grammatical machinery. The creation of such forms is independent of their subsequent fate, because they may or may not become the new norms. (...) Thus one aspect of extension of forms or patterns is clearly a function of the use of grammar, that is, speech production.’

<sup>27</sup> For a discussion of the relatively productive drive-crazy sense of drive, see Boas (2003: 129-130, 234-235).

<sup>28</sup> In addition to the BNC and different dictionaries, Boas (2003) relies on other electronic corpora, internet user-groups, and speaker intuitions. For details on problems surrounding the collection of data on resultatives, please see Boas (2003: 11-18).

<sup>29</sup> Collocations are ‘combinations of words that are preferred over other combinations which otherwise appear to be semantically equivalent’ (Croft 2001: 180). See also Carter (1988), Sinclair (1991), and Boas (2003: 143-145). When analyzing resultatives we are primarily interested in the types of collocational restrictions that hold between the main verb and its postverbal constituents.

<sup>30</sup> Note that slight modifications such as stone dead still fall within this range.

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<sup>31</sup> Other event-frames associated with wash denote different types of semantic concepts. These include, among others, the funnel-sense (Kim washed the dirt into the sink). See also Boas (2002a, 2002b).

<sup>32</sup> For so-called ‘obligatory resultatives’ and their collocational restrictions see Boas (2003: 128-130, 234-238, 341-342).

<sup>33</sup> In discussing the licensing of fake objects, G&J (footnote 22, p. 550) also address the status of ‘reflexive objects.’ They point out: ‘[T]he interpretation required would be one involving a “split self”: one’s superego acts on one’s ego (or however one wishes to describe the split-self scenario). As predicted, this is possible with certain intransitive motion verbs such as: (i) She marched herself out of the kitchen’ (2004: p. 550, fn. 22). Interestingly, this is exactly what Boas (2003) points out, based on Lakoff’s (1996) ‘Divided-Person Metaphor’ and the example sentence After school, I marched myself down to the public library (2003: 241): ‘The realization of fake reflexives in resultative constructions such as in (7.40) is a consequence of the fact that under certain circumstances humans perceive their bodies as two separate entities, namely as agents and patients’ Boas (2003: 242-243).

<sup>34</sup> Another example of fewer collocational restrictions is fake objects occurring with run. Here, we find a wide range of non-prototypical event participants such as the pavement, himself, the shoes, his feet, etc., as well as the full range of possible result states that need to be recruited from world knowledge about possible outcomes of running events (see Boas 2003: 240-253).

<sup>35</sup> On this view, G&J’s examples including fake reflexives (Bill cried himself to sleep vs. \*Bill cried Sue to sleep) are licensed by an event-frame that only allows access to off-stage information about the Agent of the activity, but not other types of event-participants (see Boas 2003: 253-256).

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<sup>36</sup> For a full discussion of different types of fake object resultatives (motion and property resultatives), see Boas (2003: 240-260).

<sup>37</sup> Similar observations have been made by Haiman (1978) about the interpretation of conditionals such as If my hen lay an egg today, the Cologne cathedral will collapse tomorrow. Haiman (1978: 578) points out: ‘A person confronted by this will attempt, perhaps against his better judgment, to devise a scenario in which antecedent and consequent are logically connected before rejecting the sentence as nonsense.’ Non-conventionalized resultatives function in a similar way by requiring larger amounts of off-stage information. Thanks to Brian Joseph for pointing this out to me.

<sup>38</sup> Wechsler (2005) shows that ‘the semantics of the resultative construction is sensitive to the scale contributed by the adjective heading the AP, suggesting that the verb and adjective form a complex predicate.’ Sentences such as Dip a soft cloth in the solution, wring it damp and wipe furniture with it are counterexamples to Wechsler’s generalization that requires the durative verbs to go with maximal endpoint closed-scale gradable adjectives. Wechsler explains that ‘damp is one of the minimal endpoint (partial) adjectives predicted to fail as a resultative’ and comes to the conclusion that the sentence violates ‘the constraint posited above, perhaps due to coercion by context.’ This leads him to the conclusion that ‘the grammar “leaks”. Clearly pragmatic context plays a role but the appeal to the role of pragmatic context is not the end of the story, but the beginning. (...) The challenge is to explain why the leaks occur where they do.’ The analysis proposed in Boas (2003) can be extended to explain the licensing of such sentences in terms of non-conventionalized resultatives and world knowledge. A speaker wishes to express a non-conventional outcome of a wringing activity and utilizes the event frame of prototypical wring in combination with contextual background information to license damp, which is not a

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conventionally expected result state of wringing (the decision to express a non-conventional result effectively ‘frees’ the event-frame from its typical selection restrictions placed on the resultative phrase). As such, the detailed frame-semantic selection restrictions associated with wring (prototypical outcome: dry) are overridden by contextual background information. Note that this type of override is subject to certain constraints. In this case, damp has to be construed as a possible outcome of wringing. Since it is an antonym of the prototypical outcome of wring (i.e. dry), damp can be licensed as a resultative AP in this context. In other words, damp is the prototypical non-conventionalized outcome of wring.

<sup>39</sup> Müller (2005) criticizes Boas (2003) as ‘rejecting syntactic theories on the basis of collocational data and with reference to selectional restrictions.’ He also claims that ‘Boas’ argumentation in Chapters 2-4 follows the following pattern: The analysis of X cannot explain the collocational pattern Y or the violation of selectional restrictions in a sentence Z; therefore it is wrong.’ In my view this critique is not justified, as I do not argue against the specific syntactic, semantic, and aspectual theories per se. Instead, I point out that the different analyses of resultatives couched in these particular frameworks are inadequate for capturing the full distribution of resultatives. I do not make broad claims about the adequacy of these frameworks in general. This is also mentioned explicitly in Boas (2003: 318-319): ‘Though the analysis I have proposed in this book is developed within Construction Grammar, it should transfer fairly straightforwardly to other constraint-based theories of grammar (...). That is, by adopting a different view of what has traditionally been called “the lexicon”, the integration of event-frame information in terms of (mini-) constructions will allow for a more specific ‘input’ for generative mechanisms used to derive syntactic structures in other frameworks. Such a step holds the

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promise for other theories to arrive at more adequate predictions about the collocational restrictions holding between a verb and its postverbal arguments.’ This observation also holds true for the constructional view proposed by Goldberg (1995) and G&J (2004): Keeping their four subconstructions in place, detailed event-frames could then specify the different selectional restrictions for the postverbal constituents. Following this strategy would mean that ‘because productivity is partial, the lexicon must contain the existing conventional senses as well as the rule’ (Lehrer 1990: 240). Similarly, other approaches to resultatives proposed in different frameworks (e.g. Hoekstra 1988, Carrier & Randall 1992, Verspoor 1997, Rappaport Hovav & Levin 1998/2001, Wechsler 2001) may incorporate the results of Boas (2003) by utilizing the detailed lexical selection restrictions that main verbs impose on their postverbal constituents in order to arrive at a more adequate account of resultatives.