

Resultative constructions

Syntax, world knowledge, and collocational restrictions*

Review of Hans C. Boas: *A Constructional Approach to Resultatives*.
Stanford: CSLI Publications [*Stanford Monographs in Linguistics*].
2003. x + 400.

Reviewed by Stefan Müller (University of Bremen)

1. Contents of the Book

Hans C. Boas' book *A constructional approach to resultatives* book is the significantly revised version of the author's Ph. D. thesis (University of North Carolina at Chapel Hill). It is a well written monograph about Resultative Constructions that consists of an introductory chapter, chapters about syntactic approaches to resultatives, the role of event structure and lexical semantics, the role of Argument Structure Constructions, chapters about a usage-based analysis of resultatives, event-based Frame Semantics, and lexical licensing of resultatives, and a final chapter containing a contrastive look at resultatives in English and German. There is an appendix containing information regarding frequencies and other important facts about resultative constructions that are extracted from corpus data and 31 (!) pages of references.

In the first chapter, Boas introduces the empirical subject of the book, namely resultative constructions involving verbs that take a direct object (1) where the resultative predicates over the direct object, resultative constructions with fake objects (2), and resultative constructions with fake reflexives (3).

- (1) She turned the spray and stained the white front of his shirt blood red.
(British National Corpus)
- (2) Frank sneezed the napkin off the table. (Goldberg, 1995, p. 152)
- (3) But most of the dogs were unhappy and would bark themselves hoarse.
(BNC)

Boas describes his frustrating experiences with data collection where speakers gave diverging acceptability results regarding such constructions and argues that corpus data should be used for developing a usage-based approach to resultative constructions. He mentions that his study is based on a collection of about 6000 example sentences from corpora, which makes the book the largest data pool of English resultative constructions.

In Chapter 2, he discusses syntactic approaches to resultatives. He starts with Small Clause analyses, where it is assumed that a predicative element together with its subject forms a “Small Clause” (SC).

- (4) a. Mary considers [_{SC} Kim smart].
 b. Lisa painted her door_i [_{SC} PRO_i pink].

Section 2.2.2 focuses on Hoekstra’s theory (1988), who assumes a Small Clause Theory where the postverbal NP is part of the Small Clause, i. e. a structure like (5):

- (5) paint [_{SC} [_{NP} the door] [_{AP} green]]

Boas uses the following examples from Carrier and Randall, 1992, p. 187 to criticize Hoekstra’s detransitivization rule that suppresses an object of a transitive verb to free the object slot in order to get an intransitive verb that can be combined with a Small Clause complement.

- (6) a. *The bears frightened the campground empty.
 b. *The baby shattered the oatmeal into portions.
 c. *The magician hypnotized the auditorium quiet.

He argues that Hoekstra has no effective mechanism to account for the semantic selection restrictions with respect to the SC subject and that Hoekstra’s SC analysis cannot explain why some predicates cannot appear in resultative constructions with a particular verb:

- (7) a. John painted the house {green/*old/*expensive}.
 b. The joggers ran their Nikes {threadbare/*purple/*new}.
 c. The gardener watered the tulips {flat/*red/*cheap}.

In the Sections 2.2.3–2.2.5, Boas discusses work by Aarts (1989, 1992) and Bowers (1997) and argues with different examples that these accounts face similar problems and cannot account for the distribution of resultative phrases.

In Section 2.3, Boas discusses approaches based on Williams’ Predication Theory (Williams, 1980). He argues that ternary structures have the advantage that both the resultative predicate and the base verb can assign theta-roles to

the postverbal NP (p. 43), but that these approaches are no compelling alternative to the SC Theory, since they cannot explain which resultative predicates are permissible with which matrix verbs.

He continues with proposals by Rothstein (1985); Napoli (1989, 1992); Carrier and Randall (1992) and claims mainly on the basis of similar material that these approaches do not yield a full coverage of the distribution of resultative constructions. In Chapter 3, Boas deals with approaches by Tenny (1994); Winkler (1997) and Rappaport Hovav and Levin (1998, 2001) that refer to event structure. He argues *that it is extremely difficult to capture the distribution of resultatives on the basis of event structure alone*, which leads him to *abandon event structure-based analyses of resultative constructions*.

Chapter 4 deals with Goldberg's Construction Grammar account of resultatives (1995). Goldberg assumes that there are phrasal constructions that add the resultative meaning to the meaning of the base verb and that also license additional arguments in the case of fake reflexives or fake objects. After discussing various interesting data related to Goldberg's claims Boas concludes: *Since she proposes that the construction has the capability of imposing arguments 'on the semantics directly associated with the predicates' (1995: 221), Goldberg has to state her constraints at the constructional level which sometimes turns out to be a level of abstraction that is too general*. Chapter 5 contains a detailed study of the usage of resultative constructions. The distribution of certain verbs and resultative predicates is explored, collocational patterns are examined and the conditions under which resultative constructions can be used are discussed.

In Chapter 6, Boas introduces simple event-frames and complex event-frames that are needed to specify verbs like *paint* and caused-motion constructions with verbs like *blow*. The complex event-frames contain both event participants and different time slots labeled SOURCE, PATH, and GOAL. In most cases in the following chapters, Boas discusses the GOAL slot. The representation in (8) is an example lexical entry which is suggested for a transitive verb like *paint* (p. 191, p. 224).

- (8) Simplified event-frame of the prototypical sense of *paint* including world knowledge 'W'

GOAL

Ag (W p2) Pt (p3)

Ag: object covering a surface with paint

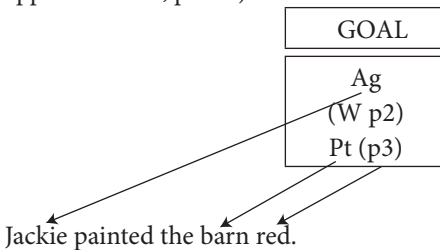
Pt: surface or object exhibiting a surface

p3: AP or NP denoting a color or a property associated with the prototypical intended end result of applying paint to a surface

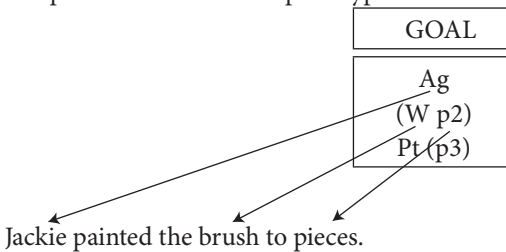
Optional elements are listed in brackets. The result state of the patient (p3) is optionally specified as indicated in (8). Such lexical entries allow Boas to specify the result states for resultative constructions with non-prototypical result states (p2) with a patient that is licensed by world knowledge (W). The ‘W’ represents all of the general world knowledge a speaker associates with painting events (p. 181–182). Furthermore he can specify the canonical result state (p3) in the lexical entry and whether it is realized as an AP, an NP, or a PP. Linking conditions (p. 190, p. 244) link the elements in (8) to appropriate syntactic categories and phrase structural positions.

The examples in (9) and (10) show how the lexical entry in (8) can be used in utterances. (9) shows the case where the canonical result state is specified in the sentence and (10) shows the case where a patient is recruited from world knowledge and a noncanonical result state is specified.

- (9) Perspective of the prototypical senses of *paint*, *sweep*, and *open* (first approximation, p. 257)



- (10) Perspective shift based on prototypical senses of *paint* and *sweep* (p. 258)



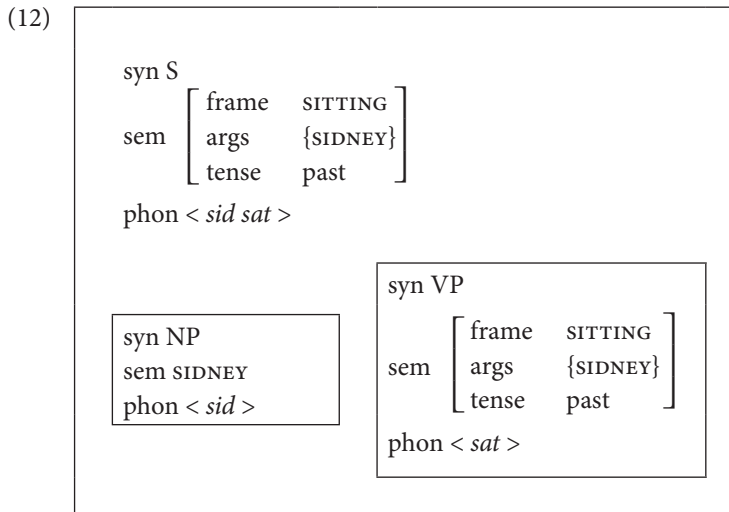
In Chapter 7, it is discussed how resultatives like (11) with unconventional result states can be licensed by analogy to a similar, more abstract verb in the same semantic class.

- (11) Tom sneezed the napkin off the table.

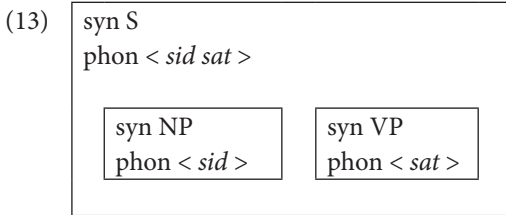
Chapter 8 contains an English/German comparison emphasizing the point that different idiosyncrasies can be observed in the two languages, which is explained by different lexicalizations/conventionalizations in the respective languages.

2. Evaluation

Boas' argumentation in Chapters 2–4 follows the following pattern: The analysis X cannot explain the collocational pattern Y or the violation of selectional restrictions in a sentence Z; therefore it is wrong (*does not adequately explain the [...] data* (p. 34), *unnecessary for the analysis of resultative constructions* (p. 41), *This [...] leads me to abandon event structure based analyses of resultative constructions* (p. 59), *superfluous* (p. 117)). Although similar argumentations are sometimes found in the literature they are logically not sound. To see this consider the following description provided by Kay (1998):



If we take away the semantic information from (12) we get:



If we assume that (12) is a correct description of the sentence *Sid sat*, then (13) is not wrong. It is just incomplete. It describes only certain aspects of the sentence under consideration.

Rejecting syntactic theories on the basis of collocational data and with reference to selectional restrictions is like going to a construction site and requesting to tear down a house since it does not have a roof. It is only legitimate to utter such a request if it can be shown that it is impossible (for static or other reasons) to put a roof on top of the almost finished house. As will be shown in the following, Boas did not do this.

2.1 Hoekstra's Small Clause Analysis

Boas argues that there is no way to rule out unattested sentences like those in (14) in Hoekstra's analysis:

- (14) a. John painted the house {green/*old/*expensive}.
 b. The joggers ran their Nikes {threadbare/*purple/*new}.
 c. The gardener watered the tulips {flat/*red/*cheap}.

This criticism is not justified. Hoekstra assumes that a theta role is assigned to the SC complement. Since Hoekstra is dealing with syntactic properties of resultatives this assumption is sufficient as far as the result predicate is concerned. If we establish a connection between a predicate and its argument we can impose further constraints on this argument as for instance that the argument is a possible result of the action described by the main verb. See also Section 2.2.

On page 31 Boas criticism is that *Hoekstra's analysis has no effective mechanism to account for the semantic selection restrictions with respect to the SC subject*. However, on page 28 Boas remarked that *Hoekstra attributes interpreting the postverbal NP of transitive verbs as direct objects of the matrix verbs to a purely pragmatic phenomenon, or so-called 'shadow interpretation'*. Boas does not discuss how the reference to a vehicle like shadow interpretation is motivated, but there are data that show that such a mechanism is needed: The

following examples by de Geest (1970, p. 45) and Kirsner and Thompson (1976) show that the knowledge about the fact that one sees Hans if one sees ‘Hans laughing’ should not be represented in the lexical representation of the verb *see* but should be attributed to a general inference process that provides us with this information.

- (15) a. We saw the invisible nerve gas kill all the sheep (but of course we didn’t actually see the invisible nerve gas itself).
 b. I felt George get on the other end of the water bed (but, of course, I didn’t actually feel George).
 c. I smelled Sylvia spraying the living room (but I couldn’t smell Sylvia herself).
 d. From my vantage point 10 miles away, I watched them blow up the bridge (but, needless to say, from that distance I couldn’t see the individual commandos involved).
 e. We heard the farmer slaughter the pig.¹

In addition in cases like (16), expletives are not interpreted as an argument of the verb, since the weather *es* is incompatible with the object requirements of the transitive *see*.

- (16) Er sah es regnen.
 he saw it rain

If we have a general mechanism that looks at the accusative object in constructions like (15)–(17) and infers from world knowledge whether this object should be interpreted as the direct object of the matrix verb, one lexical item for the perception verbs is sufficient.

- (17) Er sieht ihn lachen
 he sees him laugh

If we assume such a general mechanism for ECM constructions like the ones above, we also can assume that it is at work in resultative constructions as well.

Boas refers to Carrier and Randall’s data (see (6)) to argue that Hoekstra’s analysis fails, but if the reference to world knowledge is allowed to rule out illegitimate resultative constructions, as Boas argues convincingly, the sentences in (6) can be said to be impossible since the process in the shadow interpretation requires the postverbal NP to be the object of *frighten*.

Furthermore Carrier and Randall’s judgments are not uncontroversial in the first place. For instance, McIntyre (2001, 2004) points out that certain

metaphorical examples like the one in (18) allow the suppression of the direct object:²

- (18) They frightened the daylight out of the campers.

There is one thing that one could advance against detransitivization analyses namely data where it is impossible to detransitivize verbs. If such cases exist, Hoekstra and proponents of similar analyses have to explain why verbs that underwent the detransitivization rule nevertheless never are used intransitively but only as input to the resultative Small Clause rule. Looking on German data, I found that most examples that were claimed to show the possibility of resultative constructions with obligatorily transitive verbs in fact involved verbs that can be used intransitively. The one clear exception are verbs like *freuen* ('to be pleased') and *schämen* ('to be ashamed') which are inherently reflexive and cannot be used without the *sich* (Müller, 2002, p. 216). See Kunze, 1997, p. 135 on *schämen*. However, the sentence in (19a) is idiomatic in that it does not mean that somebody gets stupid as a result of pleasure.³

- (19) a. Er freute sich dumm und dusselig über das Buch.
 he pleased himself stupid and daft over the book
 'He was pleased as punch about the book.'
 b. *Er freute.
 he pleased

Boas excludes similar idiomatic cases (p. 261, p. 319) and therefore he cannot regard (19a) as evidence in the detransitivization issue. Later in the book (p. 72–74), the argument realization principle of Rappaport Hovav and Levin (1998, p. 113) is discussed. As an example for obligatory arguments the change of state verb *break* is discussed:

- (20) a. Trace broke the dishes.
 b. *Tracy broke. (Rappaport Hovav and Levin, 1998, p. 72)

Note though that in a context where people discuss the preparation of pasta and the way to bring the very long noodles to a reasonable size, one can say:⁴

- (21) Ich breche lieber, statt zu schneiden, das geht besser.
 I break rather than to cut this works better

I. e. in a context where the object is clear and the only relevant point is how the integrity of a thing is to be destroyed one can use *brechen* ('to break') without an object. So this kind of example cannot be used against an analysis based on intransitive or intransitively used verbs.

On page 54, Boas discusses Rapp's examples (1997, p. 101) that are supposed to show that Carrier and Randall's claim that obligatory transitive verbs exhibit the same semantic restriction as they do in non-resultative sentences does not hold for German:

- (22) a. *Er streichelte.
 he stroke
 b. *Er streichelte ihre trüben Gedanken.
 he stroke her sad thoughts
 c. Er streichelte ihre trüben Gedanken weg.
 he stroke her sad thoughts away

Having read the introduction of Boas' book where he remarks that corpus data yields more reliable results than speakers' judgments and especially the following statement in a footnote on page 12, I was a little bit surprised to find Rapp's data in his book.

For example, Boberg (2002: 12) in his analysis of reliability of native speakers' intuitions points out that 'while it may be necessary or even desirable to turn to native speakers' intuitions as evidence in linguistics, such evidence should always be interpreted with caution and even skepticism, and should be checked against empirical data whenever possible.' (p. 12)

In Müller, 2002, p. 223–224, I show that all of Rapp's examples that are said to involve obligatorily transitive verbs involve verbs that actually may appear without an object: the data in (23) show the examples for *streicheln*. Please refer to Müller, 2002, p. 223–224 to find examples that show that *kämmen* ('to comb'), *schieben* ('to push'), and *rasieren* ('to shave') can be used without an overt object as well.

- (23) a. Es darf nach Herzenslust gestreichelt und geschmust werden:
 Lämmchen, Zwergziegen und Kälber lassen geduldig Kraulen und
 „Ach-wie-süß“-Rufe über sich ergehen.⁵
 'It is allowed to stroke and to cuddle: little lambs, dwarf goats, and
 calves submit to fondling and 'How cute' calls.'
 b. Heutzutage wird aber weder gebadet noch geduscht, sondern
 nowadays is but neither bathed nor showered but
 gestreichelt.⁶
 stroked
 'Nowadays there is neither bathing nor showering, but stroking.'
 c. Er streichelt gut.⁷
 he strokes well

The examples in (23a,b) are impersonal passives, i. e. passives that correspond to active sentences without an accusative object.^{8,9} So these examples show that *streicheln* can be used without an object and hence it does not constitute evidence against a Small Clause Theory (or any other theory) that assumes that an intransitive or detransitivized verb is combined with a projection containing the NP and the resultative predicate (or directly with an NP and a resultative predicate).

Since Boas' criticism of the other SC analyses was formulated in the same way as the criticism of Hoekstra's account, the rejection of these proposals is as unwarranted as is the rejection of Hoekstra's proposal. There are a lot of things that can be said against Small Clause analyses (Bresnan, 1982, Section 9.6; Williams, 1983; Booij, 1990, p. 56; Hoeksema, 1991; Neeleman and Weermann, 1993; Neeleman, 1994, 1995; Pollard and Sag, 1994, Chapter 3.2; Stiebels, 1996, Chapter 10.2.3; Winkler, 1997, Chapter 2.1, Müller, 2002, 7.4), but these arguments (mainly syntactic arguments) are not discussed in Boas' book.

2.2 Lexical rule-based approaches

In the chapter about Goldberg's approach, Boas discusses Wechsler's analysis (1997). Wechsler distinguishes between control resultatives, i. e. those constructions where the subject of the resultative predicate is a semantic argument of the matrix verb (*John hammered the metal flat.*), and ECM-resultatives, i. e. those constructions where the subject of the resultative predicate is not a semantic argument of the matrix verb (*The dog barked itself hoarse.*) Boas writes:

Wechsler claims that control resultatives place semantic restrictions on their resultative phrase whereas ECM-resultatives do not. On this view, a verb's lexical entry determines whether a given verb may occur with a resultative phrase of a certain semantic type or not. While Wechsler's account comes close to capturing most of the relevant properties of resultative constructions, there are, however, two main problems for his analysis. First the distinction between control and ECM-resultatives is questionable. As we have seen in Chapter 2, even the class of resultatives that Wechsler categorizes as ECM-resultatives places semantic restrictions on their resultative phrases (cf. **She ran her Nikes blue/new/to death*). [...] The second problem with Wechsler's account has to do with the status of ECM-resultatives which are licensed by a lexical rule adding additional arguments to the verb's basic syntactic argument structure. Since the application of this rule relies primarily on syntactic criteria [...], it is difficult to constrain and thus leads to overgeneration of resultative constructions (cf. **Mary ran herself threadbare*/**Mary ran her Nikes exhausted*). (p. 101)

The first problem could be fixed in a way similar to Boas' suggestions (see below). The second claim is wrong. Since *herself* is the subject of *threadbare* and *her Nikes* is the subject of *exhausted*, the respective predicates can impose selectional restrictions on their subjects:

- (24) a. *Mary is threadbare.
 b. *Her Nikes are exhausted.

Since the adjectives impose selectional restrictions on their subject and since all selectional restrictions remain intact (in both control and ECM-constructions), the ungrammatical examples mentioned by Boas are ruled out.¹⁰ Wechsler's approach could be adapted in a way that makes it equivalent to Boas' approach as far as the set of licensed resultative constructions is concerned: Wechsler assumes that every lexical entry comes with a specification of the verb's canonical result state. A lexical rule for resultatives adds an AP complement which has to be compatible to the canonical result state. In the same way, a specification for non-canonical result states that refers to world knowledge could be added to each verb's lexical entry and a lexical rule for ECM-resultatives could take this specification into account.

In Wechsler's approach to control resultatives, the matrix verb assigns a thematic role to its object and the subject of the resultative predicate is co-indexed with the object of the matrix verb. Therefore the object of the matrix verb fills two semantic slots simultaneously. On page 71, Boas claims that *there are probably no separate assignments of theta-roles to the postverbal NP by the matrix verb and the resultative predicate, but only the assignment of one theta-role namely the theta-role of the matrix verb*. One has to ask on what basis this claim is made. What would be the empirical difference that could be used to argue for the fact that there is just one theta-role assignment? On the contrary, theories that assume that there is always a patient argument in resultative constructions have to assume that verbs like *rain* have a patient argument, since there are examples like (25) from Wunderlich, 1995, p. 455:

- (25) Es regnete die Stühle naß. → Es regnete die Stühle.
 it rained the chairs wet it rained the chairs

I would argue that there has to be an affected entity in resultative constructions, but it is not necessarily a patient of the main verb.

On page 142, Boas writes the following to motivate the patienthood of the postverbal NP:

applying Lakoff's 1976 test for patienthood shows that the postverbal NP in a sentence such as *We laughed the speaker off the stage* (Wechsler 2001: 13) is a patient and should thus be regarded as an argument of the matrix verb (although in a somewhat specialized conventionalized sense (cf. the unacceptability of **We sighed the speaker off the stage*): a. What we did to the speaker was ... b. What happened to the speaker was ...

I agree that the postverbal NP should be treated as an argument in the resultative construction, but the test that is mentioned in the above quote does not provide evidence for a treatment as a semantic argument of the matrix verb, since if we complete the sentences we have to insert the whole resultative construction:

- (26) a. What we did to the speaker was we laughed him off the stage.
b. What happened to the speaker was he was laughed off the stage.
c. *What we did to the speaker was we laughed him.
d. *What happened to the speaker was he was laughed.

So the tests show that there is an affected entity in resultative constructions, but not that this entity is a semantic argument of the matrix verb.

In a footnote in the chapter about Construction Grammar, Boas discusses Verspoor's analysis (1997) which is similar to the one suggested by Wechsler (1997). Boas writes:

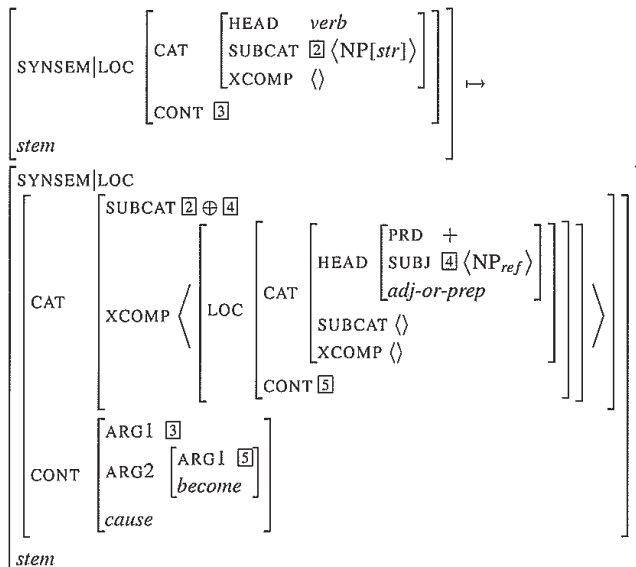
Verspoor (1997) presents an HPSG-style analysis of resultative constructions in terms of lexical rules operating over lexical entries of verbs. Although her approach is able to account for a broad variety of resultative constructions by taking contextual background information and pragmatic reasoning into account as well as pointing out the important role of a number of lexicalized idiomatic resultative constructions, her analysis is problematic, because 'a use of the verb in a particular syntactic frame triggers the application of a rule which specifies the appropriate meaning of that use.' (1997: 144) On this view, 'the verb itself does not undergo a meaning shift or acquire a permanent additional sense in the lexicon' (1997: 144) which means that verbs are interpreted according to the resultative phrases they occur with. Note that this type of explanation is faced with problems when it comes to explaining the full distribution of resultatives from the perspective of language production, because it is difficult to describe under which circumstances a given verb may occur with a certain semantic and/or syntactic type of resultative phrase. That is, the range of application of lexical rules deriving resultatives is not entirely clear in Verspoor's analysis [...]. (p. 104)

This statement is probably the result of a misunderstanding. Verspoor describes a lexical rule that is similar to the one suggested by Wechsler. She uses delayed constraints that block lexical rules from firing until certain conditions are fulfilled. In the case of the resultative construction, such a condition could be the presence of a resultative predicate. There is nothing unclear about such delay mechanisms and about using them together with lexical rules. In fact, Bouma and van Noord's article (1994) that describes such delayed lexical rules and that Verspoor refers to was published in the proceedings of one of the major computational linguistics conferences and delayed constraints are used successfully in many current HPSG implementations (Erbach, van der Kraan, Manandhar, Ruessink, Thiersch and Skut, 1995; Erbach, 1998; Bouma, van Noord and Malouf, 2001; Meurers, Penn and Richter, 2002; Meurers, De Kuthy and Metcalf, 2003; De Kuthy and Meurers, 2003).

As far as the theoretical status of lexical rules is concerned one can say that a certain formalization of lexical rules is fully integrated into the HPSG formalism. Such lexical rules are equivalent to unary projections. They are typed objects described by typed feature descriptions and their meaning is well-understood (Copestake, 1992; Meurers, 2001).

In Chapter 8.4.4, Boas criticizes Müller, 2002, which also suggests a lexical rule-based approach. Working in the HPSG-paradigm I suggested the following lexical rule for resultative constructions of unergative verbs:

(27) Lexical Rule for Resultatives with Unergative Verbs (simplified):



This lexical rule states that an intransitive verb or an intransitive version of a transitive verb is related to a verb that is subcategorized for the subject of the matrix verb ([4]), the subject of a resultative predicate (the element in [4]) and a resultative predicate (the element in *xCOMP*¹¹). This approach is similar to Hoekstra's approach in that it does assume that an intransitive verb or a verb with an optional, non-realized object is the input for this rule (See also Oppenrieder (1991, Chapter 1.5.3.7.4) and Wunderlich (1995; 1997) for similar suggestions for German).

Boas criticizes this approach as being not restrictive enough, since it admits sentences like:

- (28) a. Sie fischten den Teich voll.
 they fished the pond full
 b. Sie fischten das Telephon leer.
 they fished the telephone empty

However, that these sentences are not ruled out is correct, since it is possible to provide contexts in which they could be uttered: If we imagine a pond that is supposed to contain fish that is caught in a river nearby a house, a task could be to fish enough fish so that the pond becomes full. As far as the second example is concerned one could imagine an advertisement event organized by a telephone company where the task is to fish things (maybe animals) out of a telephone. Apart from this context, it is also possible to fish for electric circuits flying around lose in a real telephone.

Boas cannot claim that these are weird contexts and that the present argument therefore is not valid, since he is very good in constructing weird contexts himself. See for instance p. 64 where he gives a context for *Evelyn wiped the dishes red.* and p. 100 where he explained *He wiped it dirty* and *He hammered the metal safe.* On page 216, he provides a Science Fiction context for *We melted ourselves to liquid.* and states: *This context will override the lexical event frame of melt.* But if the lexicon contains only default information that can be overridden by context, his lexicon does not restrict the range of possible resultative constructions at all. Hence there is no advantage of his lexical enumeration approach in comparison to other approaches that directly refer to the context.

On page 252, Boas states the following restrictions for fake objects:

- (29) Constraints on the recruitment of off-stage information for the licensing of fake objects
 (1) The fake object has to be directly affected by the energy emitted during the prototypical activity denoted by the event-frame.

- (2) The resultative phrase has to denote a property that is construable as a change of state of the fake object resulting from the prototypical activity denoted by the event-frame.

The second condition is directly captured in (27) and that the subject of the resultative predicate has to be affected can be integrated either into the semantic representation under *CONT* or into the restrictions listed under *BACKGROUND*, a feature used in HPSG to describe background knowledge which is not truth-functionally relevant. That such a formalization of additional constraints is possible was also stated in Müller, 2002, p. 245. Information about the aspectual class of the input verb and the type of possible result states is not included in (27), but this neither means that such information is not needed nor that such information cannot be integrated into such a lexical rule.

Concluding this section about lexical rule-based approaches it can be said, that Boas' criticism is not justified. Due to space limitations I will not discuss Predication Theory and Goldberg's Construction-based approach to resultatives, but directly move on to Boas' approach in the next section.

3. Boas' approach

There are some aspects of Boas' approach which I consider problematic. First, his enumerative, disjunction-based approach does not capture any generalization regarding the resultative construction. This is intended, since Boas is sceptical as far as previous generalizations in the literature are concerned. I discuss his view on generalizations in more detail in Section 5. In the following I try to point out ways how generalizations regarding resultatives can be captured.

The second problematic aspect is a minor, formal point. In his lexical entries, he used brackets to indicate optionality. The question is: Why can we omit the patient (pt) in contexts like (10) — repeated here as (30) for convenience?

- (30) Jackie painted the brush to pieces.

Since the patient argument is not listed in brackets in the lexical entry for *paint* in (8), it should be obligatory, but there actually are attested usages of *paint* without an object:

- (31) I soak the covers in a cleaning solution while I am painting to get two jobs done at once.¹²

This means that the patient should be listed in brackets as well. But if we modify the lexical representation that way, we get (32) and it is an open issue why (33) is excluded:

- (32) Adapted lexical entry with an optional patient:

GOAL
Ag (W p2) Pt (p3)

- (33)[?]*He paints red.

The problem of this representation is that the realization of material is not independent. To fix this, one has to state the disjunction in the lexical entries more carefully:

- (34) Suggestion for modification of the lexical entry of *paint*:

GOAL
Ag ∨ Ag, Pt ∨ Ag, Pt, p3 ∨ Ag, W, p2

This is basically a disjunction of the four possibilities for using *paint* in the relevant senses. We could collapse the second and the third line and use brackets, but $Ag, Pt(p3)$ is equivalent to $Ag, Pt \vee Ag, Pt, p3$, the first being a shorthand of the latter.

The second problematic point is: Why should *all of the world knowledge a speaker associates with* a certain event (p. 182) be part of the lexical entry? If we explicitly state the reference to world knowledge in lexical entries for verbs like *bark*, this helps ruling out sentences like (35a), but it does not affect sentences like (35b), which are unacceptable for the same reasons.

- (35) a. *The dog barked the postman hoarse.
b. #The dog barked and as a result of this the postman became hoarse.

In comparison to (35a), the strangeness of (35b) cannot be explained in terms of local relations between verbs and dependent elements. To realize that (35b) is bizarre we need some reasoning: We have to resolve the pronoun *this*, we have to interpret the adjunct *as a result of this*, and we have to come to the conclusion that usually barking cannot result in somebody other than the barker

to become hoarse. The example shows that we do need world knowledge in a more general inference process. So if we need such general inference processes why should we encode it in a way that enables us to rule out (35a) directly and locally? Shouldn't we use the general mechanisms that are needed for (35b) to account for (35a) as well? If we agree on this, we can simplify (34) to (36):

- (36) Generalized suggestion for modification of the lexical entry of *paint*:

GOAL	
Ag ∨ Ag, Pt ∨ Ag, Pt, p3 ∨ Ag, X, p4	+ World Knowledge

Where X is an entity predicated over by p4 and p4 is a result state. I used different symbols to indicate that no world knowledge is contained in the lexical entry to constrain X and p4. Instead the world knowledge is assumed to be separate from the linguistic representation. Once we agree upon this representation, the step towards Wechsler's ECM-resultatives is a very small one. Instead of listing everything connected with disjunctions in one lexical entry, we write down four disjunctively connected lexical entries:¹³

- (37) Generalized suggestion for modification of the lexical entry of *paint*:

GOAL	GOAL	GOAL	GOAL	+ WK
Ag	Ag, Pt	Ag, Pt, p3	Ag, X, p4	

But once we have this representation, it seems reasonable to capture the generalization, and to represent the connection between the second entry and the third entry and the connection between the second entry and the fourth entry by a lexical rule. This is what Wechsler (and others) did. If we relate the first entry to the fourth entry and omit the third one altogether, we get what I (and others) suggested:

- (38) Generalized suggestion for modification of the lexical entry of *paint*:

GOAL	GOAL	GOAL	+ WK
Ag	Ag, Pt	Ag, X, p4	

If it turned out to be the case that not all resultative constructions can be related to intransitive or intransitively used verbs, one would have to use a lexical rule that licenses resultative constructions from transitive verbs, suppressing the direct object of the matrix verb and replacing it by a fake object or linking

the real object to the subject of the resultative predicate. To avoid spurious ambiguities, one had to ensure that the lexical rule that licenses resultative constructions with intransitive base verbs does not apply to intransitively used transitive verbs.

The Small Clause approaches are similar to (38). The difference is that instead of X and p4 in the third entry, a Small Clause consisting of X and p4 is selected. As is obvious in the representation chosen for (37) and (38) in the latter approach fewer statements have to be made (one instead of two lexical rules, three instead of four lexical items) although the coverage stays the same. Another problematic point of Boas theory is the missing formalization. For instance, discussing a lexical entry for *melt*, he suggests on page 220 the following restriction on the semantics of the phrase that expresses the canonical result state: *denoting the end result state (or end location of a path) of a mass that has been liquefied by heat*.

- (39) Event-based frame semantic representation of the prototypical sense of *melt*

GOAL	
(Ag)	+ World Knowledge
Pt (p3)	

Ag: Entity exerting energy that can lead objects to liquefy
 Pt: Object that warms up and/or liquefies as the result of energy being applied to it
 p3: SYN: PP
 SEM: denoting the end result state (or end location of a path) of a mass that has been liquefied by heat

This is a very informal characterization and to decide whether a PP qualifies to specify a canonical result state, the reader has to use world knowledge. Furthermore, *heat* is not specified. What temperature is needed for something to melt depends on the substance we are talking about. It could be 55°C for a candle made out of paraffin wax, but also 0°C in the case of ice. Now consider the following sentences containing resultative constructions with the German verb *schmelzen* ('to melt'):¹⁴

- (40) a. Dann erzählt Juliane Lumumba von den Tonbändern im Archiv,
 then tells Juliane Lumumba from the tapes in.the archive
 die wegen fehlender Klimaanlage in der tropischen Hitze
 which because.of missing air.conditioning in the tropical heat

zu einer schwarzen Masse schmolzen.¹⁵

to a black mass melted

‘Then Juliane Lumumba relates how, as a result of there being no air-conditioning, the tapes in the archive melted to a black mass in the tropical heat.’

- b. Dann ging mal das Schreibpapier aus oder die bestellte Ladung

then went once the writing.paper out or the ordered load

Kerzen war zu Wachs geschmolzen, ehe sie den Hafen

candles was to wax melted before they the harbor

erreicht hatte.¹⁶

reached had

‘Then they would run out of paper or the candles they had ordered

had melted to wax before they had even arrived at the harbor.’

- c. Erz wird „direkt“ zu Eisenschwamm reduziert, der dann zu

ore is directly to iron.sponge reduced which then to

flüssigem Roheisen geschmolzen wird.¹⁷

liquid raw.iron melted is

Why is a sentence like (41) strange?

- (41) #Dann erzählt Juliane Lumumba von den Stahlträgern im Archiv,
then tells Juliane Lumumba from the steel.girders in.the archive
die wegen fehlender Klimaanlage in der tropischen Hitze zu
which because.of missing air.conditioning in the tropical heat to
einer schwarzen Masse schmolzen.

a black mass melted

‘Then Juliane Lumumba relates how, as a result of there being no air-conditioning, the steel girders in the archive melted to a black mass in the tropical heat.’

As is evidenced by (40c) it is possible to use *schmelzen* in connection with metal, however (41) is not well-formed, which is due to the fact that we talk about tropical heat which will be something like 40°C–50°C and missing air condition which had cooled down everything to something between 15°C–30°C.¹⁸ It is clear that a steel girder does not get liquid in this temperature range (the melting point for clean iron is 1535°C, the one of steel is 1500°C). Unless Boas is willing to assume that every lexical entry for a noun comes with information about the temperatures at which the materials change their physical state, he will never be able to rule out sentences like (41) by lexical specifications without reference to world knowledge. Furthermore the *and/or* in the description of the patient is problematic: The steel grinders in (41) warm up due to the

tropical heat, but they do not melt. So it seems to be necessary to refer to world knowledge in order to interpret the restriction on the patient in a way that is appropriate for the object under consideration. But if we need world knowledge for accounting for the strangeness of sentences like (41) anyway, we could make reference to lexicon external world knowledge in the other cases too and thereby we would get a much simpler and a much more general grammar that accounts for the same data.

In the introduction (p. 22), Boas writes that his theory *should transfer fairly straightforwardly to other mono-stratal theories of grammar that include a stronger orientation towards more detailed lexical-semantic information such as Head-Driven Phrase Structure Grammar or Lexical Functional Grammar*. In the conclusion of the syntactic approaches to resultative constructions he writes:

While I have shown that Small Clause Theory and Predication Theory are not properly equipped to handle the semantic and syntactic relations between the constituents of the resultative construction this does not mean that the overall frameworks should be abandoned altogether. As we will see, the alternative constructional analysis I lay out in Chapter 5 through 8 is to a large degree compatible with more syntactically oriented approaches. (p. 57, see also p. 318)

I would like to reply to these statements that Boas theory is compatible with every syntactic theory that can account for heads that take three arguments the form of which is specified in the lexicon.

4. Considering the alternatives again

Having shown that one should not rely on world knowledge as part of lexical entries, I want to consider the alternatives again.

Constructions

Goldberg (1995) suggests that there is a lexical entry for the base verb and in addition there is a phrasal Construction that provides for the special resultative meaning. The approach can be made as restrictive as Boas approach by specifying the idiosyncratic information regarding resultative constructions in the lexical entry of the base verb and by letting the Resultative Construction access this information and impose the respective (syntactic and semantic) constraints on the result predicate. There remains one problem though: Goldberg (p. 152) describes the Resultative Construction as having the pattern in (42).

(42) SUBJ [V OBJ OBL]

But (42) is not the only structure available for resultative constructions. Resultatives can appear with adjuncts and they can also be passivized, i. e. the structures in (43) can be instances of resultative constructions:

- (43) a. [SUBJ [Adv [V OBJ OBL]]]
 b. [SUBJ [V OBL]]
 c. [SUBJ [Adv [V OBL]]]

For such sentences Goldberg has to assume other Constructions (a Passive Resultative Construction and a Resultative with Adverb Construction). Goldberg uses inheritance links to relate Constructions to each other. Such inheritance links are equivalent to transformations that map one tree onto another tree.

A Construction-based account cannot capture the commonalities of German and English resultatives, since the syntactic structure(s) that would be associated with the German Resultative Construction differ(s) from the English structure(s). In a lexicon-based treatment, English and German resultatives can be treated in parallel. The different syntactic structures follow automatically from the general syntactic principles that constrain syntactic structures in the respective languages.

Jackendoff (1975) distinguishes between two approaches to lexical rules: The impoverished lexical entry theory and the full entry theory. Researchers who assume the impoverished lexical entry theory have to assume a basic lexical entry from which other lexical items can be derived by the application of lexical rules whereas proponents of the full entry theory assume that all lexical entries are listed in the lexicon and lexical rules are devices that relate these lexical entries thereby reducing the storage cost.

As Boas argued convincingly, lexicon-based theories of resultatives have to account for the fact that there are idiosyncratic restrictions on the resultative predicate or that sometimes a resultative construction is excluded.

Lexical rules. Impoverished lexical entries

In early work on HPSG, a full entry theory of the lexicon was assumed (Flickinger, 1987; Pollard and Sag, 1987; Calcagno, 1995; Calcagno and Pollard, 1995), but more recent formalizations assume either the impoverished lexical entry theory or mixed versions with some items licensed by lexical rules but listed in the lexicon and some items created on the fly (Krieger and Nerbonne,

1993, Chapter 7.4.1; Copestake and Briscoe, 1992; Briscoe and Copestake, 1999; Meurers 1995, 2000, Chapter 4, 2001).

In an Impoverished Lexical Entry Theory, we would assume that L1, L3, and L5 are listed in the lexicon and L2, L4, and L6 are licensed by a lexical rule. The lexical rule generates extensions to the lexicon.

- (44) L1 → L2
 L3 → L4
 L5 → L6

A problem occurs if utterances involving L6 are ungrammatical. In this case, one would need a blocking mechanism that prevents the lexical rule from applying to L5.

Briscoe, Copestake and Lascarides (1995) and Briscoe and Copestake (1999) provide a formal account of such blocking mechanisms. Verspoor (1997, p. 148–150) treats the lexical rules that license resultative constructions as semi-productive lexical rules. Idiosyncratic lexical entries are listed in the lexicon and their existence in the lexicon blocks the rule application in the same way as the existence of certain lexical entries can block otherwise regular morphological processes (an example is *er*-nominalization that converts verbs into nouns: *tanzen* ('to dance') → *Tänzer* ('dancer'), *singen* ('sing') → *Singer* ('singer'), but there is no form **Stehler* (*'stealer') related to *stehlen* ('steal'), since this is blocked by an already existing word *Dieb* ('thief')). If we want to capture the fact that for instance L4 has idiosyncratic restrictions, we could do two things, either we block the rule application for L3 and enter the lexical entry L4 into the lexicon directly or we list the idiosyncratic information that is relevant for L4 in L3 and let the lexical rule transfer it to L4. As was argued by Verspoor the first approach is more adequate, since it captures the fact that many resultatives are lexicalized and acquired idiosyncratic meanings.

Lexical rules. Full Entry Theory

In the Full Entry Theory, we would relate lexical entries that are listed in the lexicon.

- (45) L1 → L2
 L3 → L4
 L5

So instead of saying that the application of the lexical rule to L5 is blocked, there are no two objects L5 and L6 that could be related. The idiosyncratic

information regarding L4 is contained in L4 and does not have to be stated in L3. This discussion shows that the following statement is not right:

Since the distribution of resultative phrases is at least partially arbitrary and cannot be predicted on general grounds, it must be conventionalized information associated with matrix verbs. (p. 142)

The association of all information with the matrix verb is not necessary. If we assume that we have a set of lexical entries in a full-entry lexicon, the idiosyncratic information can be contained in a lexical entry that is used in resultative constructions and that is related to the matrix verb by a lexical rule. Alternatively one could assume an impoverished lexical entry theory with semi-productive lexical rules and blocking mechanisms.

One advantage of the Full Entry Theory over the Impoverished Lexical Entry Theory is that one can have multiple relations between lexical entries, which may be desirable to model cases of multiple motivation of derived words (Becker, 1993, p. 16):

$$(46) \quad L7 \rightarrow L8$$

$$\quad \quad \quad \downarrow$$

$$\quad \quad \quad L9 \rightarrow L10$$

If we would specify the corresponding lexical rules in an Impoverished Lexical Entry Theory, two independent lexical entries of the form L10 would be licensed and the grammar would overgenerate. Another advantage of the Full Entry Theory is that one does not have to divide lexical entries into basic lexical entries and derived lexical entries, but as far as resultative constructions are concerned this is not relevant, since resultative constructions are always more complex both in syntactic structure and in meaning so that it is clear which lexical item is the basic lexical entry.

5. Generalizations

Talking about generalizations, let me start with some quotes which I think show the extreme position advocated in Boas' book. The following quote taken from Gross, 1994, p. 214 is used as the motto for Chapter 7:

More syntactic properties of sentences than usually thought depend on the main verb. (...) The systematic description of French verbs (or simple

sentences) has shown that no two verbs have the same syntactic properties. (...) As a consequence, verbs have to be described individually, and not in terms of intentional classes. The proportion of the lexicon of idiomatic sentences, of metaphorical and technical sentences with no compositional meaning, is very high. All these sentences or sentence types have anecdotal origins. Hence, they have to be described individually, that is, without reference to classes of lexical combinations or of interpretation patterns. (Gross, 1994, p. 214)

However, the authors do not discuss the problematic cases of the members of a single semantic class not being able to occur in the same syntactic environment and thus avoid accounting for the — in my view — most important part of a verb's meaning, namely its idiosyncratic part. (p. 81)

I suggest that an enumerative approach in terms of a lexical semantic network of interrelated yet distinct senses achieves more adequate results when it comes to describing the distribution of resultative constructions. (p. 193)

Throughout the book the emphasis is put on irregularities and idiosyncratic behavior. Boas mentions in several footnotes that there is the possibility of factoring out common information in inheritance hierarchies but he does not do it. Instead he suggests several example lexical entries in a semi-formalized representation. The question is: What would happen if somebody pointed out that a certain verb can be used in a different way or that the description of a possible agent is too specific or too general? The answer would be: For this specific usage I suggest another lexical entry. Or: All right, I change this lexical entry.

Boas view on generalizations is an extreme position overemphasizing the point that every single word differs from all the others. The other extreme can be found in many of today's linguistic publications. Many articles are written with the aim to publish something that is accepted as a leading idea, although it is totally unclear how a realization of this idea might look like. Often the empirical basis is dubious because it is based on introspection alone and this is the sort of situation where one can demand "the house to be torn down" since it is build on shaky grounds and nobody will ever feel comfortable in it. What I believe to be needed in Theoretical Linguistics is something in the middle. We have to work in a data aware way and we have to deal with (as many as possible) specific instances of the patterns we are interested in, as it was done by Boas, but we also have to care for generalizations and the broader the variety of subcases that is covered by a (non-trivial) generalization, the better the generalization is.

The question to be asked about Boas theory is: how would the generalizations be captured in an inheritance system. He probably would suggest a type that corresponds to (34), i. e. a type that has a disjunctive specification including four disjuncts. Then there would be subtypes corresponding to intransitively used or intransitively used verbs, transitive verbs, transitive verbs with a result state where the result predicate predicates over the patient and verbs with a fake object and a resultative predicate where the resultative predicate predicates over the fake object. Verbs like *paint* are subtypes of all three of these types. Verbs that do not allow for fake objects do not have instances of the respective subtype, but only instances that are subtypes for the transitive pattern and possibly for the agent patient resultative pattern.

Let me finish this section with the discussion of two more quotes.

In order to predict the semantic range of event participants as well as the ability to occur with resultative phrases, it is thus necessary to first lexically list the properties of all the conventionalized combinations denoting specific semantic concepts. Only with such a bottom-up approach will it be possible to arrive at valid generalizations. (p. 236)

I think that this is not a very good research strategy. If biologists would wait till they know all species on the world before they start classifying them, they would never start working.

This means that to the extent that Wechsler's generalization hold, they are epiphenomenal in that they are a side effect of only a certain number of verbs conforming to them. (p. 143)

Resultative constructions are a very difficult research topic as far as the semantic patterns are concerned and Boas nicely and convincingly shows that many generalizations that have been proposed by other researchers are not without exceptions (p. 136–137), but this should not force us to give up and to not try and find real generalizations that describe resultative constructions or classes of resultative constructions.

6. Conclusion

Boas' book is well written, well-structured, and easy to read. He drives the point home that one needs to refer to world knowledge and collocational restrictions to rule out certain resultative constructions, but his dismissal of other accounts on the basis of his examples is not justified. The book is of interest to everybody

who works on secondary predication. The corpus work is impressive and the appendix with the data useful. CSLI Publications is one of the few publishers that sell books for reasonable prices.

The book can be bought for \$30 at <http://cslipublications.stanford.edu/site/1575864088.html>. This page also contains a link to the full corpus material (the URL given in the appendix is broken).

Notes

* I thank Ann Copestake, Dan Flickinger, Andrew McIntyre, and Detmar Meurers for comments and discussion of issues related to this review.

1. De Geest (1970, p. 45) gives this example in Dutch. What was probably heard is not the farmer but the pig.

2. See also Jackendoff, 1997 and Verspoor, 1997, p. 149 for similar examples.

3. The same holds for alleged counter examples like (i), discussed by Richter (2002, p. 244):

- (i) Die Bären erschreckten die Wanderer zu Tode.
the bears frightened the wanderers to death
'The bears frightened the wanderers very much.'

The wanderers do not die because of the fear.

4. The intransitive use of *break* in a similar construction seems to be impossible in English.

5. Mannheimer Morgen, 23.04.1991, Lokales; Mistgabel gibt den Ton an.

6. Mannheimer Morgen, 18.09.1999, Lokales.

7. In Müller, 2002 I did not provide a corpus reference for (22c) since I relied on my intuition, but a similar sentence can be found in Michel Houellebecq, *Elementarteilchen*, List Verlag, 8. Auflage, 2003, p. 275, translated by Uli Wittmann.

8. Kaufmann and Wunderlich (1998, p. 20) mention other verbs (*stellen* ('to put'), *leeren* ('to empty'), *fällen* ('to fell')) as possible counter examples to a detransitivization analysis. I discussed these cases as well. If verbs can be found that cannot be used without their object this would mean that the process of suppression of an argument and addition of a SC complement has to happen in one step, i. e. without licensing an intransitive verb that could be used in an analysis of an ungrammatical sentence. Compare also the lexical rule-based analysis of resultative constructions discussed in Section 2.2.

9. Boas discusses the sentences in (22) in connection to a different claim, namely Carrier and Randall's claim that transitive verbs impose the same selectional restrictions on their

postverbal NPs in resultative constructions as they do in non-resultative constructions. Since *streichen* and the other verbs discussed by Rapp can be used intransitively, Rapp's data cannot be used to falsify Carrier and Randall's claim.

10. On page 147, Boas argues that it is normally not possible to exchange the resultative predicate of *paint* with a non-color denoting phrase. As an example Boas uses the adjective *intelligent*. His argument would have more force if he used another adjective that can predicate over *house* in non-specialized contexts, since *paint the house intelligent* is ruled out anyway because of the incompatibility of the selectional restrictions of *intelligent* and *the house* (There is a specialized reading for *intelligent house* where the term means that a house contains an elaborated system of electronic sensors that regulate heating and switch the light on and off automatically).

11. For an analysis of the predicate complex without the feature XCOMP see Müller, 2005.

12. How to paint the interior of your house. http://idid.essortment.com/howtointerior_rvxy.htm at 09.01.2004

13. Note that (36) is only a part of a lexical entry. The disjunctive specification of parts of the description in (36) captures the fact that the rest of the information (for instance information about phonology) is identical for each disjunct. If we have four lexical entries like in (37), the additional information has to be stated for each of the four lexical entries. This is no problem if we assume that such lexical entries are related by lexical rules. Conventionally lexical rules only mention information that differs between lexical items. Therefore the fact that the four disjuncts in (37) share a lot of information is taken care of, if lexical redundancy rules are used.

14. The sentences in (40a,b) are taken from Müller, 2002, p. 231.

15. Frankfurter Rundschau, 05.08.1997, p. 3.

16. Frankfurter Rundschau, 028.02.1998, p. 8.

17. Die Presse, 11.01.1992; Voest will vom Staat acht Milliarden Schilling.

18. The actual value is culture dependent. Northern Americans seem to prefer shock freezing, i. e. temperatures at the lower end of the scale.

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Reviewer's address:

Stefan Müller
 Theoretische Linguistik/Computerlinguistik
 Universität Bremen/Fachbereich 10
 Postfach 33 04 40
 D-28334 Bremen
 E-mail: Stefan.Mueller@cl.uni-bremen.de