

On English and German Resultative and Causative-Resultative Derived Verbs

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Abstract

This study is based on two related semantic patterns as *tertia comparationis* called 'resultative' and 'causative-resultative'. It aims to provide answers to two guiding questions: What commonalities and differences between English and German can be identified in the way (causative-)resultativity is morphologically expressed in derived verbs? How can differences be explained in a way that relates to more general characteristics of the two languages? Examples of relevant verbs include *enable*, *fossilise*, *narrow*, *solidify*, *scrap*, *tighten* and *beruhigen*, *erblinden*, *kristallisieren*, *personifizieren*, *spitzen*, *versteinern*. One set of differences that emerges from the descriptive part as particularly striking and is consequently focused on concerns the number of verbs that have a) only the resultative meaning, b) only the causative-resultative meaning, and c) both meanings: There are significantly more derived (causative-)resultative verbs that express only resultativity in German than in English. Most of the English verbs express both resultativity and causative-resultativity; none expresses resultativity to the exclusion of causative-resultativity. This observation is explained by considerations along the lines of Hawkins (1986, 1988). The topic itself, the approach taken and the descriptive results also raise issues of a more theoretical nature, such as morphological transparency and the different roles played by adjectives and nouns as derivational bases. These aspects are also discussed.

1 Introduction

Word-formation (or, rather, lexeme formation) is commonly considered to be a part of morphology, with morphology being concerned with the systematic relationships between the forms and the meanings of lexemes (see e.g. Booij 2005: 4f.).^{*} More specifically, word-formation deals with systematic form-meaning relationships that exist between different lexemes which are formally related. In very general terms, contrastive word-formation can be said to study the commonalities and differences that exist between the word-formation systems of two languages. Such investigations can take various approaches, but any approach has to be based on a *tertium comparationis* (TC) (see e.g. Krzeszowski 1990: ch. 2). The basic TC can be identified on the form side or on the meaning side of the systems of form-meaning relationships.

The TCs underlying the present work are located on the meaning side. They are two semantic patterns adopted and adapted from Motsch (1999/2004), a work on German word-formation, in which about 120 semantic patterns are identified and argued to be realised by morphological patterns involving what is commonly called conversion, affixation, particle verb formation and compounding. A semantic pattern and a morphological pattern that expresses it together constitute a word-formation pattern. My versions of the two semantic patterns from Motsch that are of primary interest here are given in (1) below (cf. Motsch 1999/2004: 118-

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124).¹ They are expressed in a notation familiar from semantic theories that are based on the principle of compositionality and adopt ideas from predicate logic.

- (1) a. The resultative semantic pattern:

[BECOME(P(x))](x)

'a participant *x* undergoes a process that results in *x* having the property denoted by P (to an increasing degree)'

e.g.: English: *fossilise, mature, solidify, tighten*

German: *erblind(en),² kristallisier(en), versteiner(n), welk(en)*

- b. The causative-resultative semantic pattern:

[CAUSE(y,BECOME(P(x)))](y,x)

'a participant *y* functions as a causal factor in a process that results in a participant *x* having the property denoted by P (to an increasing degree)'

e.g.: English: *enable, narrow, scrap, shorten, stabilise*

German: *beruhig(en), erheiter(n), personifizier(en), spitz(en)*

The expressions CAUSE and BECOME denote elementary predicates in (some version of) semantic theories in which the meaning of linguistic expressions is to be represented as a conceptual structure (see Motsch 1999/2004: 31 and the literature referred to there). Their arguments are given in round brackets; arguments of predicates may themselves consist of predicate-argument structures. The arguments represented by the variables *x* and *y* are those that have to be realised syntactically as objects or subjects. P is a variable for a predicate whose semantic representation, in an instantiation of the pattern, is that of a lexeme. The elementary predicate BECOME predicated of a state-of-affairs where a participant is ascribed a property is what makes the verbs instantiating these patterns resultative; BECOME being an argument of CAUSE in (1b) makes this pattern causative-resultative.³ The optional modifier *to an increasing degree* in the paraphrases is intended to account for the fact that with some of the respective verbs the process cannot necessarily be said to result in the participant's having the property denoted by P. This is the case with *kürz(en)* 'shorten' < *kurz* 'short', for instance. If you shorten an object, it will not necessarily be short, although it will be shorter than before. This obviously contrasts with *töt(en)* 'kill' < *tot* 'dead', for instance. This difference, which depends on the (non-)gradability of the lexeme whose semantic representation instantiates P, is not reflected in the patterns, which may be taken to signal that the predicates employed are not sufficiently discriminating. Note that whenever verbs serving as examples of a given semantic pattern are mentioned in the present study, this means that there is at least one sense or one use of the particular verb which expresses the semantic pattern. It does not imply that such example verbs conform to that pattern in all their senses or uses.

Motsch's (1999/2004) original representations of the semantic patterns differ in several ways from those in (1), in addition to what is pointed out in footnote 1. One difference is that he

¹ Apart from other modifications (see below), the representations are simplified by ignoring the so-called referential argument (see, among others, Higginbotham 1985: 555f., drawing on Davidson 1967).

² The *-en* or *-n* in the orthographic representation of the citation form of German verbs, the infinitive, is commonly considered to be an inflectional suffix. It can be ignored in the context of contrastive word-formation. From section 3 onwards, it will not be bracketed any more.

³ An alternative term for *resultative* found in the literature is *inchoative* (see e.g. Levin 1993: 27ff., Fleischer and Barz 1969/1995: 315). However, this is less appropriate here, because the Latin term from which *inchoative* originates, means 'begin, start', and should therefore be restricted to verbs like German *erblühen* 'to begin to blossom' or *loslaufen* 'to begin to run' (see e.g. Lewandowski 1975/1994: s.v. *inchoative Verben*).

uses the variables 'A' (semantic representation of an adjective) and 'N' (semantic representation of a noun) instead of 'P', with the respective adjective or noun functioning as the base in corresponding morphological patterns (see ib.: 4, 12f.). This notation has not been taken over for the present study mainly because it *presupposes* that this variable in the semantic pattern takes its value from the lexical entry of a lexeme. As will be elaborated in section 2, this is not obviously the case. Verbs like *rectify* or *liberate*, for instance, can be seen as derived causative-resultatives, *derived* insofar as they involve the formatives (suffixes) *-ify* and *-ate*, but their bases, *rect-* and *liber-* do not represent English lexemes. Another difference is that Motsch's original causative-resultative semantic pattern(s) involve(s) an additional elementary argument DO and a specification of the thematic roles of the arguments that are to be realised syntactically (y, x), along the following lines:

- (2) [CAUSE(DO(y_{agent}),BECOME(A/N(x_{theme}))))]($y_{\text{agent}}, x_{\text{theme}}$)
 'a participant y_{agent} causes, by some activity, a process that results in a participant x_{theme} having the property denoted by A/N (to an increasing degree)'

The reason Motsch introduces DO seems to be that he conceives of a cause-effect relation as one where an event is caused by a state or event – not directly by a participant in a state or event – so that CAUSE is a 2-place predicate whose two arguments are to be realised by propositions (see ib.: 39; but cf. also ib.: 387, 411, where *participants* appear as arguments of CAUSE in semantic patterns for noun compounds). This approach, however, which appears attractive from a philosophical point of view, does not account for uses of the relevant verbs where the syntactic subject cannot be characterised as an agent being involved in some activity. Consider uses such as:

- (3) a. Four girders stabilise the bridge.
 b. The new law narrows their options considerably.
 c. Der Film erheiterte sie.
 'The film cheered her up.'
 d. Seine Stimme beruhigte sie.
 'His voice calmed her down.'

In sentences like these, the participants denoted by the subjects are better described as factors that are involved in causing the process represented by BECOME. If this is granted, then it will also be granted that such a description of the participants denoted by the subjects as causal factors as implied in representation (1b) can also be applied to the more specific cases that are covered by representation (2). A participant that causes a process by some action (an 'agent') is just a specific type of causal factor. This consideration also constitutes part of the reason for my leaving out the designations for thematic roles in versions (1a, b) of Motsch's representations of the semantic patterns, since a causal factor is not necessarily an agent. Moreover, thematic role designations are redundant in the representations since, within a framework like Dowty's (1991) theory of thematic proto-roles, the thematic distinction between the arguments that are to be realised syntactically follows directly from one of them being an immediate argument of CAUSE and the other being embedded in the BECOME part. The semantic representation entails Dowty's (ib.: 572) agent proto-role property "causing an event or change of state in another participant" for argument y and his patient proto-role properties "causally affected by another participant" and "undergoes change of state" for argument x ; no other proto-role property is entailed. Consequently, y will be mapped onto the syntactic function subject and x onto the semantic function direct object according to his (ib.: 576) argument selection principle:

In predicates with grammatical subject and object, [...] the argument for which the predicate entails the greatest number of Proto-Agent properties will be lexicalized as the

subject of the predicate; the argument having the greatest number of Proto-Patient entailments will be lexicalized as the direct object.

Sections 3-5 of the present paper describe the morphological patterns that are used in English and German to realise the (causative-)resultative semantic patterns, pointing out commonalities and differences between the languages. One observation that will be focused on in section 6 is that, among the 4000 most frequent verbs in the British National Corpus for English and in the *Deutsches Referenzkorpus* (German Reference Corpus) for German, there are significantly more derived verbs that express only resultativity in German than in English.⁴ Most of the English verbs, by contrast, express both resultativity and causative-resultativity; actually, none seems to express resultativity to the exclusion of causative-resultativity in English. An explanation for this observation will be suggested which takes syntactic facts into account as well. In addition, the paper will address several conceptual and theoretical issues raised by these verbs, such as their formal and semantic transparency in section 2 and the different roles played by nominal bases as compared to adjectival bases in their derivation within sections 4 and 5.

The affixes considered by Motsch (1999/2004) are restricted to native, i.e. Germanic, ones. The present paper will also refer to non-native, i.e. Latinate or Romance, affixes. Particle word formation (e.g. *brighten up*; *aufklaren* 'brighten up'), which straddles the border line between morphology and syntax (cf. e.g. ib.: 44ff., Booij 2005: 22f., Carstairs-McCarthy 2002: 9ff., Katamba and Stonham 1993/2006: ch. 13), will not be considered in the present paper.⁵

2 Transparency

Derived verbs, derived either by affixation or by what is commonly known as conversion, are complex lexemes.⁶ The following quotation from Naumann and Vogel (2000: 932) expresses the common view that for a lexeme to be regarded as complex it has to manifest at least some degree of formal and semantic transparency.

In general, lexemes are either motivated or not motivated, depending on their degree of formal and semantic transparency with regard to other morphemes in a language.

Lexemes synchronically analyzed as complex words must be at least partly motivated or transparent.

With respect to (causative-)resultative derived verbs, this notion can be made somewhat more specific by distinguishing between 'full formal and semantic transparency' and 'reduced formal and semantic transparency'.

⁴ Frequency is a further TC that will be implicitly employed at several points in the present work when commonalities and differences between English and German are at issue.

⁵ The basic difference between German prefix verbs and particle verbs is that the particle, which may have the same form as a prefix, is separable from the verbal part under certain syntactic conditions (e.g. *Es klarte schnell auf*. 'It quickly brightened up.' vs. ... *dass es schnell aufklarte*. '... that it quickly brightened up.').

⁶ For what follows in this section, it is in order to note here that affixes are formatives with the status of lexical items in morpheme-based approaches whereas no such status is assigned to them in lexeme-based approaches (see e.g. Plag 2003: 179ff.). Following Iacobini (2000: 868), I prefer the term *lexeme-based* over the more common *word-based* since the base in a morphological process may be a bound form of a lexeme as well as a free form (see below in the main text; see also Aronoff 2000: 197ff.).

(4) Full formal and semantic transparency:

The morphological base is a word-form or a stem whose semantic representation is recognised as the P of the semantic pattern. The identification of a base that is a word-form or stem entails the identification of an affix, in case there is one.

E.g.: *en+slave*, *dark+en*, *fossil+ise*, *clean*; *er+krank(en)*, *be+richtig(en)*, *halb+ier(en)*, *heil(en)*.

(5) Reduced formal and semantic transparency:

The morphological base is not a word-form or stem. In a lexeme-based approach, it consequently has no lexical semantic representation. Semantic transparency can nevertheless be indirectly established to the degree that the base can be associated with a non-lexical, inferred, 'meaning' that can be recognised as the P of the semantic pattern. The identification of the base may be triggered by the prior identification of the affix.⁷

E.g.: *petr+ify*, *moll+ify*, *humili+ate*, *liber+ate*, *fratern+ise*; *mod+ifizier(en)*, *reduz+ier(en)*, *san+ier(en)*.

The notion 'stem' as used in (4) and (5) refers to "that part of the word-form in which its lexical meaning is expressed" (Carstairs-McCarthy 2000: 605). Such a stem may be free (and consequently identical to a word-form) or bound, but it is in any case associated with a lexical semantic representation. For example, in cases such as *solidify* [sə'lɪdɪfaɪ] < *solid* ['sɒlɪd] or *sterilise* ['sterɪlaɪz] < *sterile* ['sterɪl] we are confronted with bound stems ([sə'lɪd], ['sterɪl]) functioning as bases in the derivation of the verbs. The boundness of the stems does not prevent their identification with the lexemes *solid* and *sterile* respectively. Nor does the boundness of stems functioning as bases in derivations that involve umlaut (e.g. *ergänzen(en)* 'complement, complete' < *ganz* 'whole'), stress shifts such as in German verbs in *-(is)ier* (e.g. *akti'vier(en)* 'activate' < *ak'tiv* 'active'), or certain kinds of schwa deletion (e.g. *begradig(en)* [bə'gradiɡ(ə)] 'straighten' < *gerade* [ɡə'radə] 'straight', *klassifizier(en)* [klasi'fi:tsi:r(ə)] 'classify' < *Klasse* ['klasə] prevent the identification of the lexemes to which the stems belong. That is, I am assuming that these are cases of stem allomorphy in the sense of, *inter alia*, Booij (2010: 237ff.), where "the segmental composition and prosodic properties of a word under morphological embedding may differ from that of the same word in isolation" (ib.: 250),⁸ and that stem allomorphy does not prevent full formal and semantic transparency. By contrast, forms such as *petr-*, *moll-*, *reduz-* etc. as mentioned in (5) are neither word-forms nor stem allomorphs. They may be called bound bases, but the important point is that they are not phonologically related, as stem allomorphs are, to a free or bound form of a lexeme.

As hinted by the preceding remarks, I am assuming a lexeme-based approach to morphology in this paper (see e.g. Haspelmath 2002: 47ff., 165ff., Plag 2003: 179ff., Booij 2010). This approach enables a rather straightforward explanation to be given for an important class of cases of reduced semantic transparency. In a lexeme-based framework, bound bases such as *petr-*, *moll-*, *reduz-* etc. have no lexical semantic representation (see e.g. Plag 2003: 186). The 'meaning' that we may think can be attached to items like these are aspects of meaning that we infer from the meanings of the words that contain these bases and/or from etymological or cross-

⁷ However, a hypothetical first identification of an affix will subsequently be abandoned, if no 'meaning' can be deduced for such a bound base. For example, a hypothetical identification of the affix *-ier* in German *bugsier(en)* 'tow, tug, steer, manoeuvre' and *hantier(en)* 'be busy, tinker, fiddle' will have to be abandoned, as no 'meaning' can be deduced for *bugs-* and *hant-*.

⁸ Note also in this context that, according to Booij (2010: 254), "[p]sycholinguistic research has shown that stem allomorphy does not impede the recognition of relatedness between words with a common constituent".

linguistic knowledge. Semantic transparency is reduced since a semantic content for the predicate P of the semantic pattern can only be established in an indirect fashion, if at all. That is, it *can not* be established via the lexical entry for the lexeme to which the word-form or stem belongs that functions as the base in the derivation and whose denotation could be identified with the P of the semantic pattern, as in the case of full formal and semantic transparency.

For example, from knowledge of Latin, a 'meaning' for the part *magn-* of the verb *magnify* may be inferred that overlaps with the meaning of the adjective *big*. One may consequently want to call *magnify* a causative-resultative verb as it has a sense that can be paraphrased as 'cause to become big/bigger'. Or, a 'meaning' of the part *rect-* of the verb *rectify* may be inferred that overlaps with the meaning of the adjective *right* on the basis of knowledge of the meaning of *rectify* in combination with the analogy 'meaning of *rect-* : meaning of *rectify* :: meaning of *simple* : meaning of *simplify*'. One may consequently want to call *rectify* a causative-resultative verb as it has a sense that can be paraphrased as 'cause to become right'. Or, to give one example from German, a 'meaning' of the part *reduz-* of the German verb *reduzier(en)* may be inferred that overlaps with the meaning of the adjective *small*; one may consequently want to call *reduzier(en)* a causative-resultative verb as it has a sense that can be paraphrased as 'cause to become small/smaller. And so on for many more verbs in both English and German. Note that it would be methodologically counter-productive to say that verbs like *magnify*, *rectify* or *reduzier(en)* straightforwardly instantiate the causative-resultative pattern for the reason that they can be paraphrased as 'cause to become magnified', 'cause to become rectified' and 'cause to become *reduziert*' respectively. This would be a circular argumentation entailing that many transitive verbs in, for example, *-ify* and *-ier* would have to be regarded as instantiations of the causative-resultative semantic pattern which intuitively are not, such as *notify*, *signify*, *terrify* or *crucify* and *definier(en)* 'define', *stationier(en)* 'station', *schockier(en)* 'shock' or *positionier(en)* 'position'. In other words, this idea would make causative-resultative verbs out of all causative verbs, nullifying any further semantic distinctions between them.

For the specific contrastive purposes of the present paper it is not necessary to consider the domain of verbs that show reduced formal and semantic transparency. And in order to avoid any discussion of how much formal and semantic transparency is necessary for considering a verb to be complex and thus an item relevant for word-formation, the considerations are restricted to verbs that show full formal and semantic transparency. Apart from enabling me to clarify this methodological point, the lexeme-based theoretical orientation plays no important role in the present paper. For the most part the terminology is used and the statements are phrased in a fairly theory-neutral fashion or can easily be adjusted to a morpheme-based terminology.

3 Affixation to adjectival bases

In this section, reference will be made to 'the 4000 most frequent verbs in English and German' respectively. More specifically, it is the English language as represented by the British National Corpus (BNC) and the German language as represented by the *Deutsches Referenzkorpus* (DeReKo; German Reference Corpus) that the discussion will be based on. The populations of the most frequent 4000 verbs (lexemes) from each of these corpora are drawn from the "Alphabetical frequency list of the whole corpus (lemmatized)" provided at <http://ucrel.lancs.ac.uk/bncfreq/flists.html> (last access 30-10-2010) for the BNC and the base form list (*Grundformliste*) with 40,000 entries (covering all the major word classes) provided at

<<http://www.ids-mannheim.de/kl/projekte/methoden/derewo.html>> (last access 30-10-2010) for the DeReKo.⁹

3.1 Native affixation to adjectival bases

Among the 4000 most frequent verbs in the two languages, the following ones are resultative or causative-resultative, display affixation and have an adjective as their base word.

- (6) a. Native prefixation in English:
 - be-A*: belittle
 - en-A*: enable, endear, enlarge, enrich, ensure¹⁰
- b. Native prefixation in German:
 - er-A*:
erbosen, erfrischen, ergänzen, erhärten, erhellen, erklären, erkranken, erkundigen, erleichtern, erlösen, ermächtigen, ermäßigen, ermöglichen, ermüden, ermuntern, ermutigen, erneuern, erniedrigen, ernüchtern, eröffnen, erregen, erschweren, erstarren, erwachen, erwärmen, erweitern
 - ver-A*:
veralten, veranschaulichen, verbessern, verbilligen, verbittern, verblassen, verbreitern, verdeutlichen, verdichten, verdreifachen (-vielfachen), veredeln, vereinfachen, vereinheitlichen, vereinigen, verengen, verewigen, verfälschen, verfeinern, verflüchtigen, verfremden, verfrühen, vergewissern, verharmlosen, verhärten, verheimlichen, verinnerlichen, verjüngen, verkleinern, verkürzen, verlängern, verlangsamen, vermehren, vermindern, veröffentlichen, verschärfen, verschlechtern, verschlimmern, verschönern, versichern, verspäten, verstärken, verstummen, versüßen, verteuern, vertiefen, verunsichern, vervollständigen, verwirklichen, verwirren, verwüsten
 - be-A*:
befreien, beirren, bekräftigen, bereichern, berichtigen, beruhigen, beschweren, bestärken, betäuben, betrüben, beunruhigen
- (7) a. Native suffixation in English:
 - A-en*:
awaken, blacken, brighten, broaden, dampen, darken, deaden, deafen, deepen, fasten, fatten, flatten, freshen, harden, lessen, lighten, loosen, madden, moisten, quicken, quieten, redden, ripen, sadden, sharpen, shorten, sicken, slacken, soften, stiffen, straighten, sweeten, thicken, tighten, toughen, waken, weaken, whiten, widen, worsen
- b. Native suffixation in German: Not a possible pattern for (causative-)resultative verbs.
- (8) a. Native circumfixation in English (?; see below):
 - eN-A-en*: embolden, enliven

⁹ As pointed out by an anonymous reviewer, the restriction of the data base to the 4000 most frequent verbs in the sense just described may fail to identify infrequent new relevant verbs resulting from productive word-formation processes. This is true, and it thus may be possible to fruitfully supplement the results of the present paper by looking at low-frequency verbs as well.

¹⁰ An anonymous reviewer raises the issue of the basis for classifying *en-* in these verbs as either native or non-native. Indeed, the fact that four of these five verbs have been borrowed from French cannot be taken as the decisive criterion for assigning non-nativeness to *en-* here. I am following, without further discussion, the anonymous reviewer's implicit suggestion as well as Plag (2003: 85) in classifying *en-* as native.

b. Native circumfixation in German:

be-A-ig: befestigen, bereinigen, besänftigen, beschönigen
ver-A-ig: verfestigen, verunreinigen

As shown by (6)-(8), in verbs that conform to at least one of the two semantic patterns English makes use of two native prefixes, *be-*, and *en-* (but recall also footnote 10 as far as *en-* is concerned), German of three, *er-*, *ver-* and *be-*. Only English has such verbs showing native suffixation (*-en*). German makes use of two circumfixation patterns. According to Carstairs-McCarthy (2002: 74), the *eN-* / *-en* combination in *embolden* and *enliven* can be argued to involve circumfixation.¹¹ As this is the only potential case of circumfixation in the whole morphological system of English, there is no circumfixation in English for those who do not accept this one case. Marchand (1960/1969), for instance, does not list circumfixation in his subject index, and he considers *embolden* and *enliven* as belonging to a class of verbs that have the prefix "tacked on to suffixed verbs" (ib.: 163; see also Dressler 2005: 273; but cf. Bauer 1988/2003: 186). All natively affixed verbs are formally and semantically fully transparent.

One clear difference between the two languages is that native prefixation is significantly more often instantiated in German than in English. This is actually just an instantiation of general morphological characteristics of these two languages in the verbal domain. Whereas English has only *be-* and, arguably, *en-* as verb-deriving prefixes in general, German has significantly more (*ent-* and *zer-* in addition to those mentioned above as well as a number that are homonymous with separable particles, such as *durch-*, *über-*, *um-* etc.; see e.g. Barz 2005: 706). Moreover, and more importantly, German has many more verbs that display these prefixes. The other obvious difference – native suffixation with *-en* in English and no native suffixation in German – is however specific to the verbs that are the topic of this article. German does have native verb-deriving suffixes, namely *-ig* as in *peinigen* 'torment, torture' < *Pein* 'suffering, anguish' and *-el* as in *sächseln* 'speak with a Saxonian accent' < *Sachse* 'Saxonian'. These, however, do not express (causative-)resultativity. It may be added that *-en* is the only verb-deriving native suffix in English (see e.g. Marchand 1960/1969, Lieber 2004: 76).

Another difference is that most of the German affixes mentioned are not restricted to expressing the resultative or causative-resultative pattern. For example, the prefixes *er-*, *ver-* and *be-* can also be attached to bases that are verb stems, with a range of different semantic and/or syntactic effects:

- (9) a. erschießen 'shoot dead' < schießen 'shoot'
 b. erkämpfen 'win sth. by {fighting / trying hard}' < kämpfen 'fight'
 c. verspielen (trans.) 'gamble sth. away' < spielen (intrans.) 'play, gamble'
 d. beweinen (trans.) 'weep over sth.' < weinen (intrans.) 'weep'

Polyfunctionality of native affixes in the verbal domain is not found to such an extent in English.¹²

¹¹ The realisation of the prefix in *embolden* as [ɪm], rather than [ɪn], is commonly considered to be due to assimilation to the following bilabial consonant (see e.g. Katamba and Stonham 1993/2006: 28f., 32f. in connection with Marchand 1960/1969: 162ff.). The orthography reflects the phonetic realisation. The notation '*eN-*' is used to signal the alternation.

¹² Within the verbal domain, there is only one native affix, the prefix *un-*, which shows a similar kind of polyfunctionality. This prefix is involved in the formation of reversative verbs (*untie*) and of privative verbs (*unsaddle*) (see e.g. Funk 1991: 446).

3.2 Non-native affixation to adjectival bases

The relevant non-native affixes are all suffixes, namely *-ise*, *-ify* and *-ate* for English and *-ier*, *-isier* and *-ifizier* for German (which are considered to be variants by Barz 2005: 697 and Fleischer and Barz 1969/1995: 311). In both languages these affixes constitute the complete set of non-native affixes that serve for the derivation of verbs from non-verbal bases in general (see e.g. Marchand 1960/1969, Barz 2005: 697). What makes non-native affixation significantly different from native affixation in both languages is that most of the bases involved are not word-forms or stems. As pointed out in section 2, having such a base generally entails reduced formal transparency and, consequently, reduced semantic transparency.

But there *are* cases where the base is an adjectival word-form. Among the most frequent 4000 verbs in each of the two languages, the following relevant cases can be identified. These verbs are formally and semantically fully transparent.

(10) a. Non-native suffixation in English:

A-ise:

centralise, conceptualise, equalise, familiarise, fertilise, finalise, formalise, generalise, hybridise, idealise, immobilise, immortalise, immunise, institutionalise, internalise, legalise, liberalise, marginalise, materialise, mobilise, modernise, nationalise, neutralise, normalise, polarise, popularise, privatise, randomise, rationalise, realise, socialise, stabilise, sterilise, visualise

A-ify: amplify, diversify, falsify, intensify, justify, purify, simplify, solidify

A-ate: activate, alienate

b. Non-native suffixation in German:

A-(is)ier:

aktivieren, aktualisieren, halbieren, intensivieren, komplettieren, konkretisieren, legalisieren, legitimieren, liberalisieren, mobilisieren, modernisieren, neutralisieren, normalisieren, präzisieren, privatisieren, realisieren, relativieren, sensibilisieren, spezialisieren, stabilisieren

A-ifizier: Not instantiated among the 4000 most frequent verbs in the DeReKo, but potentially relevant examples to be found in *Duden: Wörterbuch* are *purifizieren* 'purify' < *pur* 'pure' and *simplifizieren* 'simplify' < *simpel* 'simple'.

The suffixes mentioned in (10) are the only affixes involved in (causative-)resultative derived verbs that are more or less productive in present-day English and German (see Plag 1999: 104, Barz 2005: 697).

4 Affixation to nominal bases

Verbs that may be argued to conform to my patterns and to be derived from a nominal base are rather infrequent and pose certain problems and difficulties of analysis. I restrict myself here to giving examples and to discussing the problems. Verbs displayed in square brackets in the lists (11a, b) below are mentioned as potential examples whose status as (causative-)resultative verbs in the sense of the semantic patterns in (1a, b) is doubted and possibly subject to revision in the ensuing discussion.

(11) a. Denominal prefixation

English:

eN-N:

[embody (in the sense "To cause to become part of a body"; OED: s.v. *embody*).],
embroil (in the sense "To bring (affairs, etc.) into a state of confusion or disorder";

cf. *broil* "A confused disturbance, tumult, or turmoil; a quarrel"; OED: s.v. *embroil*, *broil*), enact (in the sense "To make into an act [...]; hence, to ordain, decree"; OED: s.v. *enact*), enslave, entangle (in the sense "To make tangled"; cf. *tangle* "A tangled condition, or *concr.* a tangled mass", "A complicated and confused assemblage; a muddle, jumble, complication, medley, puzzle; a confused network of opinions, facts, etc.; also, a perplexed state"; OED: s.v. *entangle*, *tangle*)

be-N: befriend

German:

ver-N:

verbrüdern, [verbünden], verfeinden, verfilmen, [verfrachten], vergreisen, verholzen, verkitschen, [verpacken], verschrotten, versklaven, verslumen, vertrotteln, verwaissen, [verwässern]

b. Denominal suffixation (only non-native)¹³

English:

N-ise:

carbonise, fossilise, idolise, oxidise (in the senses "to convert into an oxide", "to cover (metal) with a coating of oxide", "to become coated with oxide"; OED: s.v. *oxidise*), victimise

N-ify: [beautify], [classify], codify, countrify, mummify, personify

N-ate: carbonate

German:

N-(is)ier:

adjektivieren, bagatellisieren, dämonisieren, gelieren, karamellieren, karamellisieren, skandalisieren

N-ifizier: [klassifizieren], kodifizieren, mumifizieren, personifizieren

While some of these verbs appear to be clear cases of the relevant kind, among them *enslave* and the English verbs in *-ise*, the German verbs in *-(is)ieren* as well as most of the German *ver-*verbs, one may have doubts about others. The literal meaning of the transitive use of German *verwässern*, for instance, is 'cause water (*Wasser*) to become part of something', not 'cause something to become water'. If this is granted, it becomes difficult to decide whether the transitive use of *beautify*, for instance, means 'cause something to become a beauty' or 'cause beauty to become part of something'. If use is made of the part-of relation in a different direction, the following analyses are reasonable: *verpacken* 'cause something to become part of a pile or bundle (*Pack*)'; *verfrachten* 'cause something to become part of freight (*Fracht*)'. If this is accepted, *embody* in the sense mentioned in (11a), *classify* and *klassifizieren* as well as the obligatorily reflexive German *verbünden* can be analysed in an analogous fashion. *Oxidise* has both the causative-resultative meaning of (1b) and meanings that involve the part-of relation (recall the three senses mentioned in (11b)) – a situation that has to be reckoned with for other verbs as well.

The point of these observations is this: In English and in German, denominal verbs are generally more difficult to judge as belonging to the resultative and causative-resultative classes as characterised by (1a, b); and their number is smaller than that of deadjectival verbs. My explanation is as follows: While adjectival expressions predominantly, perhaps always, have a predicative function – adjectives are "inherently predicational" according to Hale and Keyser (1997: 56ff.) – nominal expressions function more typically as semantic arguments than

¹³ The verbs *heighten*, *strengthen* and *lengthen* are here considered to manifest a pattern that involves the elementary predicate HAVE: (cause something to) have (more) height / strength / length. The German denominal verbs *erhöhen* 'raise' < *Höhe* 'height' and *erhitzen* 'warm up' < *Hitze* 'heat' arguably manifest the causative variant of this pattern too.

predicates. That is, adjectives are, in a way, well suited to instantiating the predicate variable P in the (causative-)resultative semantic patterns. In other words, an adjective as the base in a derived verb leaves hardly any alternative for its interpretation as a predicate in a semantic pattern. By contrast, a noun as base suggests a role as an argument rather than as a predicate in a semantic pattern. In the cases just discussed, analyses were hinted at where the semantic representation of the base noun is understood in just this way, namely as an argument of an elementary predicate PART-OF as in the semantic patterns given in (12) (where 'N' is a variable to be instantiated by the semantic representation of a noun).

- (12) a. [CAUSE(y,BECOME(PART-OF(N,x)))](y,x)
 E.g.: *alcoholise, chlorinate, hyphenate, motorise, oxidise; verwässern*
 b. [CAUSE(y,BECOME(PART-OF(x,N)))](y,x)
 E.g.: *classify, embody* (in the sense mentioned in (11a)); *klassifizieren, verpacken, verfrachten, verbünden*
 c. [BECOME(PART-OF(N,x))](x)
 E.g.: *oxidise; bewölken, verrosten, verschimmeln, verstauben, verwässern*

This elementary predicate has also been proposed by Motsch (1999/2004: 134ff.). He does not, however, take into account the fact that the base noun and the theme argument that is to be realised syntactically may function with reversed roles with respect to the PART-OF predicate, i.e. he does not recognise (12b) as a valid pattern. In the domain of nominal compounding (e.g. ib.: 404ff.), however, he does recognise that *Butterbrot* 'slice of bread and butter' < *Butter* 'butter' + *Brot* 'bread' on the one hand and *Gartenbeet* 'flower bed' < *Garten* 'garden' + *Beet* 'bed' on the other hand display a reversal of roles of the arguments of the PART-OF relation: The butter is a part of the slice of bread, but the bed is a part of the garden. Karius (1985: 120) seems to be thinking of a semantic pattern such as (12b) when she speaks of parts that are put together to form a whole in the case of verbs such as *bundle* and *cluster*. Because of the presence of the BECOME and CAUSE predicates, these semantic patterns can be called (causative-)resultative too; but they are to be distinguished from those represented in (1).

5 Conversion

(13) below provides lists of 20 common deadjectival verbs of the relevant kind from English and German. They all figure among the '4000 most frequent verbs in English and German' (as specified at the beginning of section 3).

(13) V < A conversion

English:

alert, calm, clean, clear, close, complete, cool, correct, dry, empty, free, narrow, obscure, open, round, secure, separate, slow, smooth, warm

German:

bereiten, bessern, demütigen, einigen, fertigen, grünen, heilen, klären, kürzen, leeren, lösen, mehren, offenbaren, schmälern, sichern, spitzen, stärken, töten, weißen, weiten

Conversion from noun bases poses similar problems and difficulties of analysis as discussed earlier in connection with affixation to noun bases. As far as resultative verbs of this morphological kind are concerned, there seem to be only a few candidates. Actually, the only fairly convincing examples are the verbs *gel* and *supercoil* (cf. Plag 1999: 277). The relevant entries and attested sentences from the OED (s.v. *gel*, *supercoil*) are as follows:

[*gel*]

intr. To become a gel. [...]

1917 *Sci. Amer. Suppl.* 22 Sept. 191/2 Ligno-cellulose fibre..does not gel so readily by cold mechanical treatment as does cellulose. 1924 H. B. WEISER in R. H. Bogue *Theory & Applic. Colloidal Behavior* I. xv. 390 A sol containing 1 per cent of pure gelatin does not gel until around 10°. 1933 FISCHER & HOOKER *Lyophilic Colloids* I. ix. 159 These explanations..do nothing to make clear why the silicic acid so frequently gels before being precipitated, or the relationship of the gelling process to the precipitation. 1953 KIRK & OTHMER *Encycl. Chem. Technol.* XI. 162 It causes the ink to body up and finally to gel completely. 1970 *Nature* 25 July 371/1 The mixture gelled at T_0 °C. After 5 h..the cell was warmed a few degrees to make the gelled oil transparent.
fig. 1958 *Observer* 30 Mar. 14/3 The combination of drawingroom and documentary failed to gel. 1966 *Listener* 14 Apr. 549/1, I recognize the moment As when an awareness gels.

[*supercoil*]¹⁴

a. *trans.* To make (a molecule) into a supercoil. b. *intr.* To become a supercoil. [...] 1982 *Sci. Amer.* July 87/1 When the ethidium is removed, the ring [of DNA] supercoils.

While the OED mentions only the resultative meaning for *gel*, it is clear that the verb can also express causative-resultativity in present-day English, although predominantly with a figurative sense, as shown by the following examples extracted from the WWW.

- (14) a. Time in the studio gelled the band's already energetic and tight sound.
 b. The strong leadership of the headteacher has gelled the staff into a cohesive team, [...].

As for causative-resultative verbs resulting from denominal conversion, the examples in (15) may be cases in point, at least in some senses of the words:

- (15) V < N conversion
 English: chaff, chamfer, char, fool, recruit, scrap
 German: häckseln, narren, schroten

6 Expressing resultativity and/or causative-resultativity

Considering how many of the natively affixed verbs in the two languages have only the resultative or only the causative-resultative meaning and how many have both meanings, an interesting observation can be made. In English, of all the 43 verbs listed in (6)-(8), 35, i.e. about 81%, have both meanings; these are:

- (16) awaken, blacken, brighten, broaden, dampen, darken, deepen, fatten, freshen, harden, lessen, lighten, loosen, moisten, quicken, quieten, redden, ripen, sadden, sharpen, shorten, sicken, slacken, soften, stiffen, straighten, sweeten, thicken, tighten, toughen, waken, weaken, whiten, widen, worsen

They all appear in the *-en* suffixation class, within which they form an even larger majority. By contrast, of all the German verbs listed in (6)-(8), a much smaller proportion has both meanings without the help of additional morpho-syntactic means, namely 5 out of 94, i.e. about 5%. These are:

¹⁴ The noun *supercoil* means: "A coiled coil; *spec.* a structure sometimes assumed by DNA in which the double helix itself is coiled or looped" (OED: s.v. *supercoil*).

- (17) erhärten, erhellen, ermüden, verbittern, verhärten

The qualification "without the help of additional morpho-syntactic means" acknowledges the fact that many of the verbs in (6)-(8) that are not listed in (17) have only the causative-resultative meaning, but can express the resultative meaning when they are used reflexively, as exemplified in (18).

- (18) a. Sie hat ihr linguistisches Wissen erweitert ('She has broadened her linguistic knowledge')
 b. Ihr linguistisches Wissen hat *(sich) erweitert ('Her linguistic knowledge has broadened')

However, reflexivisation in German is subject to certain constraints that prohibit it for some of these verbs, as shown in (19).¹⁵

- | | | | |
|---------|----------------------------------|---|-------------------------------------|
| (19) a. | Sie hat das Verfahren erklärt | / | *Das Verfahren hat sich erklärt. |
| | she has the procedure explained | / | the procedure has self explained |
| | 'She explained the procedure.' | | |
| b. | Sie hat ihre Kneipe eröffnet. | / | *Ihre Kneipe hat sich eröffnet. |
| | she has her bar opened | / | her bar has self opened |
| | 'She has opened her bar.' | | |
| c. | Er hat sein Buch veröffentlicht. | / | *Sein Buch hat sich veröffentlicht. |
| | he has his book published | / | his book has self published |
| | 'He has published his book.' | | |
| d. | Sie hat ihn verwirrt. | / | *Er hat sich verwirrt ¹⁶ |
| | she has him confused | / | he has self confused |
| | 'She confused him.' | | |

The point about the significantly greater tendency of English verbs than of German verbs to express both the resultative and the causative-resultative pattern can also be made with respect to the non-natively affixed verbs with an adjectival base. This is shown in (20), which gives the verbs from (10) that have both meanings:

- (20) a. English:
 centralise, equalise, hybridise, immunise, liberalise, materialise, mobilise,
 modernise, normalise, polarise, socialise, stabilise, diversify, intensify, simplify,
 solidify
 b. German: No examples.

The same is also true for the 20 deadjectival verbs in each language derived by conversion listed in (13). Those that have both the resultative and the causative-resultative meanings are:

- (21) English:
 calm, clear, close, cool, dry, empty, narrow, open, round, separate, slow, smooth, warm
 German: heilen

¹⁵ Note also that German requires the use of the auxiliary *sein* for the periphrastic perfect tenses when resultativity is to be expressed as opposed to *haben* for the expression of causative-resultativity. This is true for verbs that can express only resultativity (without the help of reflexivisation) and those that can express both resultativity and causative-resultativity. Of course, there is no such difference in auxiliary alternation in English.

¹⁶ * under the relevant interpretation. The sentence is acceptable if it is understood as a transitive construction with *er* as the agent subject and *sich* as theme object that happen to be coreferential.

The problems discussed above in identifying (causative-)resultative derived verbs with a nominal base and, consequently, the rather small number of clear cases, make it impossible to give a sufficiently soundly-based answer to the question whether the same point can be made with respect to these verbs. However, the discussion also implies that denominal derivation of (causative-)resultative verbs is rather marginal by comparison with deadjectival derivation. Therefore, the following discussion and explanatory suggestion is based on the contrastive observations given above concerning deadjectival (causative-)resultative verbs.

What has been shown in section 6 up to this point may be summarised in the following way: English verbs seem to be lexico-semantically ambiguous between a resultative and a causative-resultative meaning much more often than German verbs. This confirms for this area of word-formation what Hawkins (1986, 1988) has claimed for contrasts in English and German inflectional morphology and especially syntax. In general, German shows "a tighter fit' between surface form and semantic representation" (Hawkins 1986: 122). Or, as summarised in more detail by Hawkins (1988: 377):

There is greater ambiguity (and/or vagueness) of surface forms in English, i.e. greater collapsing of semantic distinctions and of different semantic types on common surface forms. The result is more of a one-to-one mapping between form and meaning in German, with distinct forms carrying distinct meanings to a greater extent:

cf. ambiguity (and/or vagueness) in English grammatical morphology;
pragmatic ambiguity (/vagueness) in fixed word order;
ambiguities in semantically diverse SVO and SV sequences;
ambiguities in Raising and Equi structures.

Hawkins's ideas for explaining his observations can be applied to the word-formation phenomenon pointed out here with equal plausibility, in the following way.

For a verb to express both causative-resultativity and resultativity it must be possible for the argument of BECOME that is to be realised syntactically, i.e. the argument instantiating *x* in (1a, b), to be mapped onto the syntactic function object in the causative-resultative case and onto the syntactic function subject in the resultative case, as exemplified in (22).¹⁷

- (22) a. China has greatly liberalised *its markets* during the past 10 years.
b. *China's markets* have greatly liberalised during the past 10 years.

This flexibility in the mapping of the argument onto syntactic functions, which is a result of the lexico-semantic ambiguity of the verb, allows the *x* argument to assume the pragmatic or, more specifically, information-structural function that is more often associated with the syntactic function subject in English than object, namely the topic function (see e.g. Lambrecht 1994: 131ff. on the "strong correlation between subject and topic in English"). The fact that the subject function is more strongly associated with the topic function in English is due to the more strictly constrained major constituent order in this language. Constraints applying to English allow for non-subject arguments to be in topic position, i.e. in sentence initial position, only under very specific conditions. German, by contrast, does not need the flexibility provided by the lexico-semantic ambiguity of the verbs, as the constraints on its constituent order are not as restrictive as in English (on differences between English and German in these respects, see also Breul 2007). Despite the general availability of object preposing in English, a sentence with a preposed object corresponding to the German one in (23b) (*Its markets, China has greatly liberalised during the past 10 years.*) is judged to be much more marginal, much more subject to specific contextual conditions than its German counterpart (see ib.).

¹⁷ This is an instantiation of what is often called 'causative alternation' (e.g. Levin 1993: 26ff.).

- (23) a. China hat *seine Märkte* in den vergangenen 10 Jahren stark liberalisiert.
 'China has greatly liberalised its markets during the past 10 years.'
 b. *Seine Märkte* hat China in den vergangenen 10 Jahren stark liberalisiert.

In a nutshell: As far as the verbs discussed here are concerned, English makes up for its rigidity in major constituent order by the greater flexibility in argument-to-subject mapping. This flexibility is needed for information-structural purposes. German does not need this flexibility in the verbs, as the information-structural needs are served by the greater flexibility in major constituent order.

The following and final observation concerns the number of deadjectival verbs that express exclusively the resultative meaning. In the relevant lists in (6)-(8), (10) and (13), the following verbs are cases in point:

- (24) German: erkranken, erstarren, erwachen, veralten, verblassen, verstummen, grünen
 English: None.

There is not a single English deadjectival verb attested in my data that expresses only the resultative meaning, but in German there are several that do this. Their number, though, is much smaller than that of those expressing only causative-resultativity. It seems that present-day English makes use of a very productive lexical operation that converts causative-resultative verbs into resultative ones without changing anything in their phonological make-up. That is, we find conversion between subcategories of verbs; and this operation is responsible for what has been referred to above as the ambiguity of the verbs in question and their flexibility in argument-to-subject mapping. This view is in line with the observation that conversion has been the most productive verb-deriving word-formation process in general anyway (see Plag 1999: 103ff.). Whether English had a word-formation operation that derived resultative verbs from adjectival bases directly (and nominal bases, for that matter), is, consequently, hard to say without investigating their chronological appearance in relation to that of their causative-resultative counterparts, a topic for historical word-formation research.¹⁸ In German, by contrast, the existence of derived verbs that express only resultativity provides evidence that this language did have a word-formation operation that derived them directly from adjectival or nominal bases – unless, of course, a formerly present causative-resultative meaning has become lost in the course of time. A currently productive conversion operation converting causative-resultative verbs into resultative ones, as in English, does not seem to exist in present-day German. But recall that the reflexive version of many of the verbs in question produces the same result as such a conversion operation in terms of argument-to-subject mapping. However, reflexivisation itself is not fully productive in present-day German, as has been shown above by the examples in (19).

7 Summarising conclusion

As pointed out at the beginning of this paper and as attested by this special issue of *PSiCL*, there are many ways of 'doing' contrastive word-formation. In the present study, the basic TCs are fixed on the meaning side of the systems of form-meaning relationships in the verbal domains of English and German. They consist of two closely related semantic patterns which fall into a larger class of patterns that can be called resultative and causative-resultative. The guiding questions, then, are: What commonalities and differences between these two languages can be identified in the way these patterns are expressed morphologically in derived verbs? Can any of

¹⁸ I would not want to draw any conclusions on this from denominal *gel* discussed above, whose first attested resultative meaning is given as 1917 by the OED while its (figurative) causative-resultative meaning has not yet been recorded at all.

the differences be commented on in a manner that counts as an explanation and may thus be taken to advance our understanding of the structures of the two languages? One set of differences that emerges from the descriptive part as particularly striking concerns the number of derived verbs that have a) only the resultative meaning, b) only the causative-resultative meaning, c) both meanings (with the group of verbs being restricted to the 4000 most frequent ones in the BNC and in the DeReKo, respectively). This set of differences can be summarised in the following way:

Table 1. Frequency tendencies of derived (causative-)resultative verbs

	(a) only resultative	(b) only causative- resultative	(c) both
English	none	few	many
German	few	many	few

The contrast displayed in columns (b) and (c) is explained by the information-structural preference for having subjects as topic expressions in English in connection with the rather rigid major constituent order in this language as compared to German – a line of thought also inherent in Hawkins (1986, 1988). The explanation suggested for the contrast displayed in column (a) goes as follows: While present-day English derives resultatives by conversion from causative-resultatives, German has derived them from adjectival and nominal bases. Whether resultative < causative-resultative conversion was also operative in German is a question that will have to be answered by research into historical word-formation.

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