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TITLE Semantic patterns in noun/verb conversion in English

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1. Introduction

This is a corpus-based quantitative study of the semantic patterns found in noun/verb conversion in English.

The semantic change present in noun/verb conversion has been the subject of a number of interpretations. It has been usually acknowledged that several semantic patterns can be expressed by conversion. This has been raised as an argument against the interpretation of conversion as derivation by a zero affix or zero-derivation, alongside other justifications.

A number of such semantic patterns are cited in the literature, usually based on Plag's (1999: 219-220) summary of classic descriptions by Marchand (1969: 365ff.), Kastovsky (1974: 384ff., 1994: 97-98), Clark & Clark (1979), Quirk et al. (1985: 1560ff.), Tournier (2010: 185ff.) and Cetnarowska (1993: 86ff.), among others (cf. also other references therein as well as the review of these patterns, e.g. in Don, Trommelen & Zonneveld, 2000: 948-950 or in Martsa, 2007):

Table 1. Semantic patterns in English conversion according to Plag, 1999: 219-220 and Bauer, Lieber & Plag, 2013).

Locative	put (in)to X
Ornative	provide with X
Causative	make (more) X
Resultative	make into X
Inchoative	become X
Performative	perform X
Similative	act like X
Instrumental	use X
Privative	remove X
Stative	be X

All these patterns can be viewed as specifications of the meaning of the base that, as described in Štekauer (1996: 46) and, similarly in Ackema (1999: 218), result in *conceptual recategorization* as ACTION by addition of various features to the base.

This description raises a number of questions that, to the best of my knowledge, have not been answered in the literature in terms of experimental research, and on which a quantitative study can cast light. This paper is intended to address three of them, namely:

i) What is the relevance of each of these patterns in conversion with respect to the rest (Section 3.1)?
ii) How (un)even the distribution of this set of patterns is, especially compared with the distribution of patterns found in other denominal verbalizing affixes that may convey several meanings (Section 3.1)?
iii) How fixed the initial set of patterns is (Section 3.2).

The latter question is especially relevant, in view that additional cross-cutting categories like movement in time and space, typical action of the base or typical function of the base, have been proposed (cf. Karius, 1985, cited in Plag, 1999: 220; cf. also Dirven 1999), and also in view that it is not decided how empirically appropriate each of these patterns is. This is also relevant in view of examples that are apparently not covered by the patterns usually referred to in the literature, e.g.:

(1) *Human composers must **envy** the cat its ears* [BNC]
(2) *And the fans **faced** years deprived of their number one sport* [BNC]

These and other examples are considered in this paper in relation to the questions posed above based on .the method described in the following section.

2. Method

2.1. Data selection

The data are a stratified sample of lemmas tagged both as noun and as verb in the *British National Corpus*, plus a parallel sample of verbs derived by productive affixation, specifically by prefixation of *em-*/*en-*, and by suffixation of *-ate*, *-en*, -(*i*)*fy* and *-ize*/*-ise*. Affixal derivatives are here used for comparison, as long as the affixes in question lend themselves to various semantic patterns (cf. Quirk et al., 1985: 1557-1558; Bauer, 2002: 1713-1715; Plag, 2018: 92-94, 98-100), as in the following table:

Table 2. Semantic range of affixal derivation
(-(*i*)*fy* and *-ize*/*-ise* presented as one column following Plag, 2018: 92-94)

em- / *-en*	Locative	put (in)to X
em- / *-en*	Resultative	make into X

-ate	Ornative	provide with X
-ate	Resultative [categorial meaning]	make into X

-en	Causative	make (more) X
-en	Inchoative	become X

-(*i*)*fy* / *-ize*	Locative	put (in)to X
-(*i*)*fy* / *-ize*	Ornative	provide with X
-(*i*)*fy* / *-ize*	Causative	make (more) X
-(*i*)*fy* / -	Resultative	make into X

ize -(*i*)*fy* / -*ize*	Inchoative	become X	*ize* -(*i*)*fy* / -*ize*	Similative	act like X
-(*i*)*fy* / -	Performative	perform X			

Sampling consisted in:

i) Selection of an initial set of the verbs with four or more characters (except numbers) listed in the BNC, by use of Lara-Clares' (2016) *Scáthach*, an online search tool for sample selection at variable intervals of frequency ranges and according to a number of variables, including the occurrence of affixes and word-class.

ii) Sampling by extraction of entries by affix, unless the entry includes non-lettering symbols, e.g. brackets. When several realizations of the affix are possible, e.g. *-ise* vs. *-ize* or *-ify* vs.*-fy*, lists for each realization were used to minimize exclusion induced by variant realizations, as in, e.g. *liquefy*.

iii) For conversion, the list of nouns and the list of verbs in the BNC were compared and the entries occurring in the two lists were extracted using a Python code designed by Fernández-Alcaina.

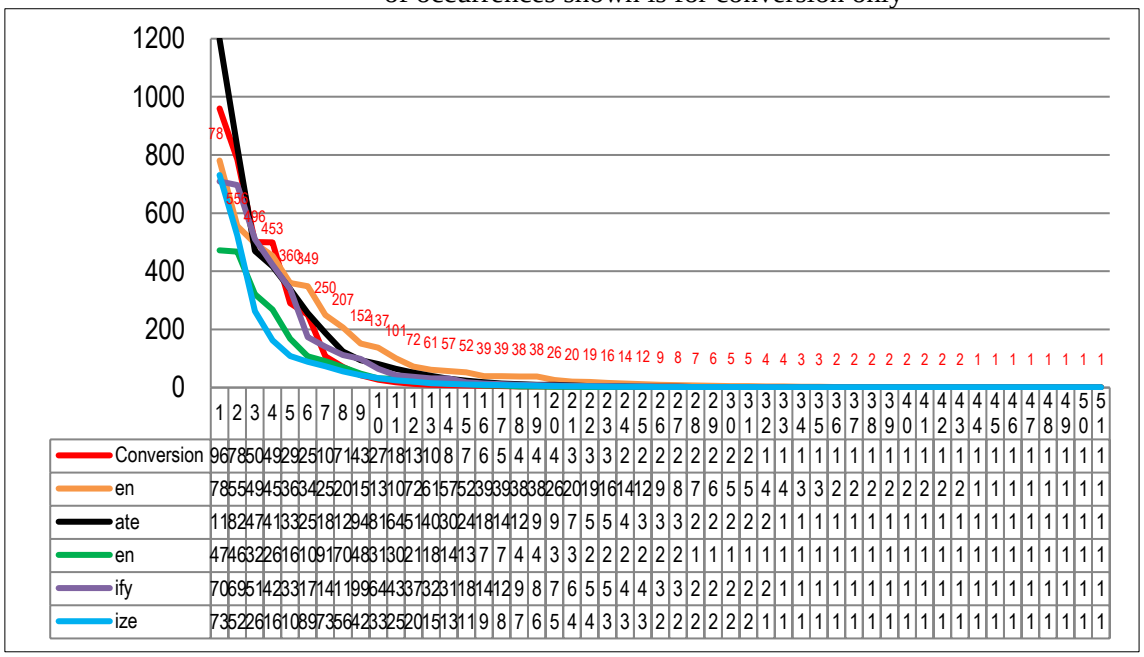
iv) Both entries for conversion and for affixal derivation were sampled, such that one out of every X was selected to obtain a final 50-entry list, where X is $\frac{\text{size}_{\text{list}}}{\text{results}}$. Thus, e.g., for affixal derivation by *-ate*, the 1437-entry list obtained from i) to iii) above was calculated as 1437/ 50 = 29, so 1 out of every 29 entries was extracted counting from frequency 1 upwards, i.e. priming the representation of hapaxes for their presumed productivity.

v) A sample design preserving the same base for the derivatives across the various groups of word-formation resources would have been desirable as a way of controlling the influence of the base and its interaction with the affix, but was unattainable: research on competition in affixation with respect to the same bases has attested as few as 96 groups of nominal competitors diachronically (e.g. *scatter* vs. *scatteration* for the expression of ACTION) and 28 synchronically (e.g. *aliment* vs. *alimentation* for the expression of ACTION) despite starting out from an initial list of 1147 bases (Lara-Clares 2017). The same happens in verbal competition, where 117 groups of competitors were identified diachronically (e.g. *dull*, *dullify* and *dullen* for the expression of CAUSATIVE) and 63 synchronically (e.g. *pink* vs. *pinken* for the expression of CAUSATIVE) from an initial list of 1117 bases (Fernández-Alcaina 2017). In both studies, converted forms where extracted from the OED in order to collect all forms derived from the same base.

vi) The entries recorded in the sample which were not of relevance, e.g. examples cited as back-formation in the OED (unless the OED allowed for the possibility of a different development not in terms of back-formation, e.g. *encrypt*), repeated bases (e.g. *oversimplify* with respect to *simplify* within -(*i*)*fy* suffixation, both in the original sample), were wrongly tagged to the point of being irrelevant (e.g. *krause* as conversion) and other similar instances of irrelevance were replaced whenever possible by entries retrieved from the corpus within the same frequency range or within the closest possible frequency range, regardless of spelling, such that e.g. *lyophilize* (frequency 1) replaced *lachaise* (frequency 1). In certain cases, e.g. in low frequency ranges and/or in certain affixes (e.g. frequency 1 within *-en* suffixation), the original entry was retained and marked as 'not relevant' for the semantic analysis. The replacements and the original irreplaceable entries are listed in Appendix I.,

which is also a checklist of the entries researched and their concordances in the BNC. The frequency ranges thus obtained in the sample are represented graphically in Fig. 1:

Figure 1. Frequency ranges represented in the sample, by process/affix. The number of occurrences shown is for conversion only



2.2. Data processing

The entries in the sample described above were searched for in the BNC for identification of the semantic category conveyed in each occurrence. The overall number of occurrences used as the experimental basis are as in Table 2:

Table 2. Occurrences classified by process/affix

Conversion	*-en*	*-ate*	*-en*	*-ify*	*-ize*
3587	4554	4381	2166	3527	2063

Semantic classification was based on the analysis of the concordances available under each of the lemmas recorded in the sample. The categories used for the classification start out for classification from the categories described in the literature and summarized in Section 1, i.e. following, e.g. Plag (1999) and Bauer, Lieber & Plag (2013).

Semantic classification relied on the terms of the definitions used by the *Oxford English Dictionary* for each entry, i.e. classification was as far as possible according to the match between the terms of definitions and the paraphrasis of each category. For some entries, this match was complete (e.g. *melodramatise* defined as 'To make melodramatic') but it was not in most others. In the latter case, approximations of the hyponyms or hypernyms used in the dictionaries were made (e.g. *exemplify* interpreted as ORNATIVE based on the definition 'To support, illustrate, or demonstrate (an assertion, general rule, etc.) with an example or examples'). Consultation with additional researchers was made in case of doubt. Each concordance was classified in terms of one category, even if two were, strictly speaking, possible for the concordance in question, e.g. *codify* classifiable as ORNATIVE or as RESULTATIVE, according to the definition 'To reduce to a general system; to systematize'. Emphasis was laid on the semantic nature of the classification, such that syntactic adjustment of any of the patterns to fit specific examples was considered secondary to the objective of this paper. Thus, for example, the semantic pattern ORNATIVE (*provide with X*) was considered to apply equally to *bomb* and to *shell*, regardless of the need for a preposition or not.

(1) *They're being bombed and **shelled** every day and night just as in Sarajevo* [BNC]

Wherever the abovementioned initial semantic categories did not represent the semantic category of a given concordance or entry, analysis in terms of deverbal conversion into nouns was attempted so as to cater for the possibility of reversed directionality, i.e. as verbs converted into nouns as evidenced by, e.g. the paraphrases used by Sanders (1988) or Bauer & Huddleston (2002). If this interpretation did not fit the concordance in particular, reinterpretation was attempted in terms of the best-fitting semantic categories recorded in Bagasheva (2017), whether they entailed noun-to-verb or verb-to noun conversion.

3. Results

3.1. Pattern relevance and distribution

The distribution of the semantic categories in the sample of conversion is represented graphically in Figures 2a and 2b:

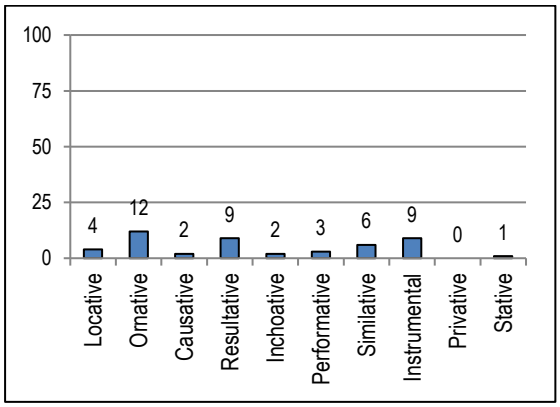


Figure 2a. Semantic categories in conversion

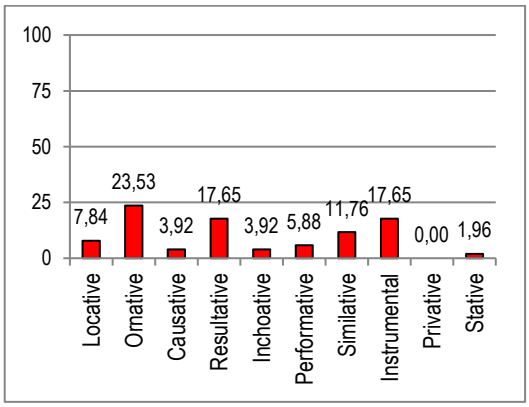


Figure 2b. Semantic categories in conversion

by entry (absolute values) by entry (percentages)

The absolute values, here referred to the entries of the sample, reveal a low sample size that is however not influential in that, following Plank's (2010) approach to directionality, this paper researches semantic category by sense and not by lemma, thus allowing the representation of polysemanticity. The distribution of the semantic categories in the sample of conversion by senses within each entry is represented graphically in Figures 4a and 4b:

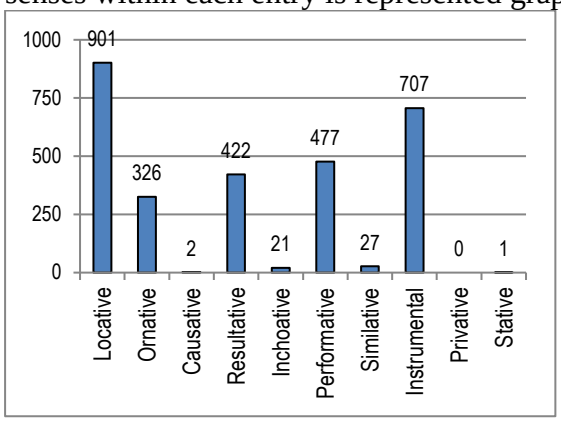


Figure 3a. Semantic categories in conversion by sense (absolute values)

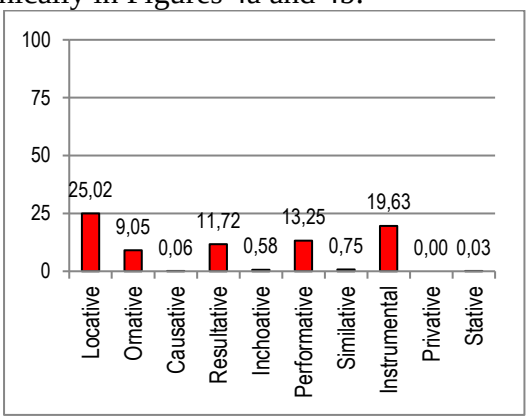


Figure 3b. Semantic categories in conversion by sense (percentages)

The figures in Figures 4a and 4b, more representative than those of Figures 3a and 3b, show a bias towards given categories (in this case, towards LOCATIVE on account of the monosemanticity of the most frequent entry in the sample, *jail*), but they also confirm two points that are apparent in the two sets:

i) Certain semantic categories are not represented, specifically PRIVATIVE is not recorded, and

ii) The aggregate figures do not exhaust the number of concordances in the sample: the aggregate percentage of the figures in Figure 3b. amounts to 80,09%.

The distribution of semantic categories in the samples collected for comparison is represented graphically in Figures 5 to 10:

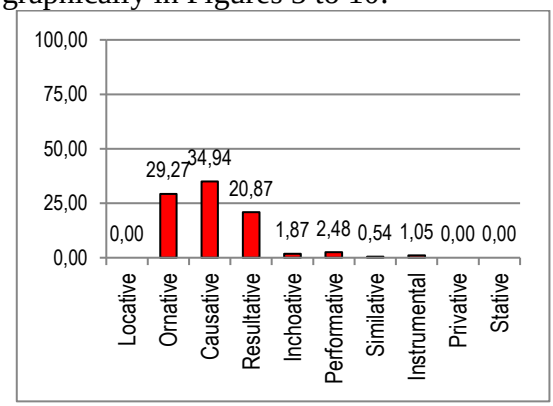


Figure 4. Semantic categories in *-ate* prefixation by sense (percentages)

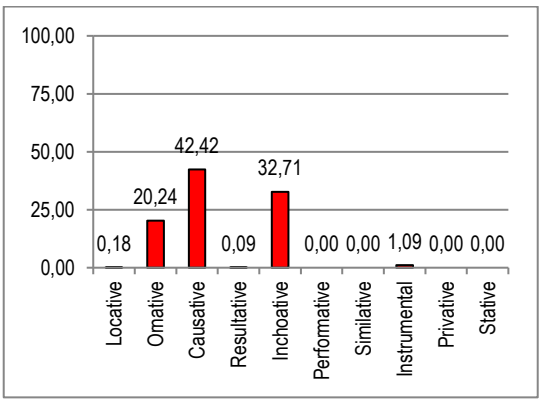


Figure 5. Semantic categories in *-en* suffixation by sense (percentages)

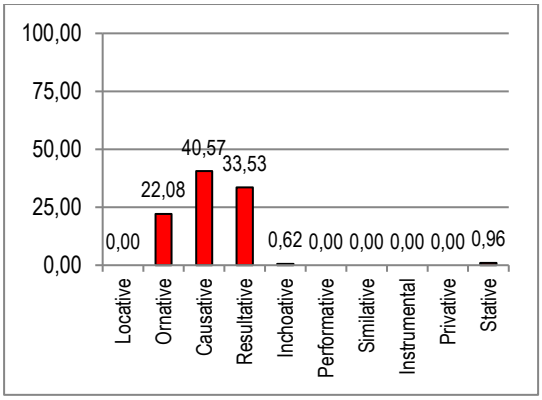


Figure 6. Semantic categories in -(*i*)*fy* prefixation by sense (percentages)

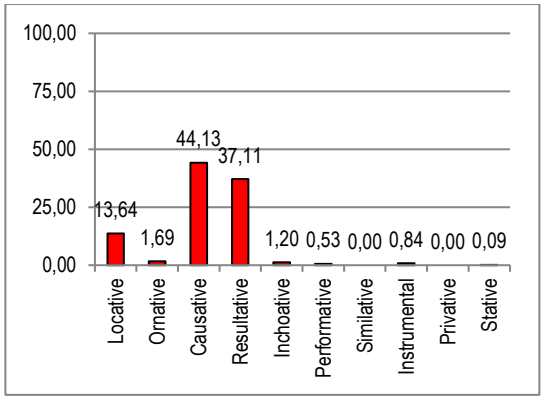


Figure 7. Semantic categories in *-ize*/*-ise* suffixation by sense (percentages)

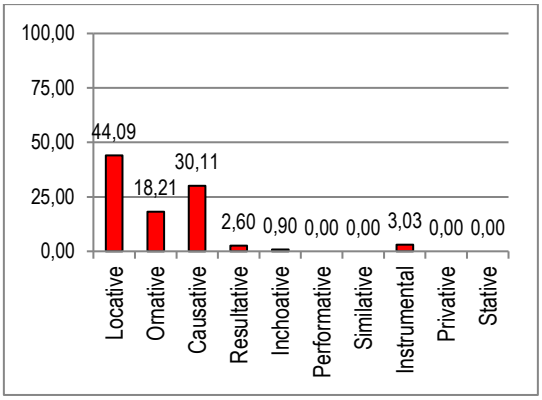


Figure 8. Semantic categories in *-en* prefixation by sense (percentages)

Leaving aside potential (dis-)similarities between the distribution of semantic categories between these processes, two points are apparent again compared with what happens in conversion:

i) Semantic categories that stand out in conversion whether the representation is by entry or by sense (i.e. bearing mind both the possibility that one frequent unit is responsible for the high occurrence of one category, or that a number of infrequent units are responsible for the high occurrence of one category (Figures 3a and 3b) are either not represented for affixation, or are to unsubstantial degrees. These categories are:

   a. PERFORMATIVE, attested to the following percentages:
      en- prefixation: 0,00% (0 out of 4421 relevant concordances)
      -ate suffixation: 2,48% (106 out of 3887 relevant concordances)
      -en suffixation 0,00% (0 out of 2204 relevant concordances)
      -(*i*)*fy* suffixation: 0,00% (0 out of 3537 relevant concordances)
      -ize/*-ise* suffixation: 0,53% (12 out of 2250 relevant concordances)
   b. INSTRUMENTAL, attested to the following percentages:
      en- prefixation: 3,03% (134 out of 4421 relevant concordances)
      -ate suffixation: 1,05% (45 out of 3887 relevant concordances)
      -en suffixation 1,09% (24 out of 2204 relevant concordances)
      -(*i*)*fy* suffixation: 0,00% (0 out of 3537 relevant concordances)
      -ize/*-ise* suffixation: 0,84% (19 out of 2250 relevant concordances)

ii) The aggregate percentages are much closer to exhausting the number of concordances in the sample than in conversion:

en- prefixation: 98,94%
-*ate* suffixation: 91,03%
-*en* suffixation 96,73%
-(*i*)*fy* suffixation: 97,77%
-*ize*/-*ise* suffixation: 99,24%

Not any of the figures reaches 100% for the occurrence of repeated, irrelevant and/or unclear concordances. Still the relevant cases in the above account for a bigger number of concordances than in conversion, and the irrelevant concordances make under 10% at most. By contrast, the irrelevant cases recorded in conversion amount to 12,03%. This leaves 7,89% concordances unexplained either in terms of the semantic categories listed in Plag (1999), or as irrelevant cases.

The patterns attested in Figures 3a and 3b suggest an uneven distribution of the semantic categories in conversion in two senses:

i) The semantic categories are distributed unevenly. This may be put down to the bases sampled or to the process itself. An influence of the former is evident in view of the values shown e.g. for LOCATIVE in conversion on account of the occurrence of an entry that lends itself to this interpretation instead of others. This occurrence is however random and shifts a part of the focus to the potential for polysemanticity that bases may have or not (cf. Clark & Clark 1970) on potential senses guided by context in conversion.

ii) While all the semantic categories listed are possible, the non-occurrence of some (e.g. PRIVATIVE) only means it is not in the sample, i.e. it does not mean it is not possible. Similarly, the non-occurrence of certain other categories that can be considered but are not in the usual list of semantic categories for conversion, alongside the record of a number of concordances that are not accounted for in terms of the usual list of categories (7,89% of the total number of concordances in the sample for conversion), suggests that other semantic categories may be included. Which those categories are, according to the study sample, responds to examples like (1) and (2) cited above. Actual examples of the sample that are not represented in the figures given above are cited below with their definitions according to the OED between brackets to illustrate the difficulty to explain the examples based on those definitions:

i) *blare*^{V} to wail. (OED)

(3) *Somewhere behind her a horn* ***blared****.*

ii) *kitten*^{V}

(4) *As the females, when they have kittened, no longer seek the company of the males*

iii) *nightclub*^{V} to visit or go to a nightclub. (OED)

(5) *A few months ago they had a row, and Steve stormed off and went* ***nightclubbing*** *in London for the weekend.*

hair^{V} †1. To edge with hair or fur
2. To free from hair; to depilate.
3. To produce or grow hair.
4. To fit hairs to (a violin-bow). (OED)

(6) *HAIRY SKIING. This month's Snowviz is devoted to ways in which you can use your own hairstyle to improve ski performance. To explore the potential of this*

*idea further, we sent these leading hair stylists to the Alps. Here are some of their exclusive tips for **hairing** down mountains with minimum control: Shave your head. Baldness is not only sexy, it is aerodynamic.*

iv) *weather*^{V} to withstand and come safely through. (OED)

(7) *Malone **weathered** the storm and broke out to seal the match after 69 minutes*

v) *fowl*^{V} to catch, hunt, shoot, or snare wildfowl. (OED)

(8) *In the wettest and wildest parts of the marshes, fishing and **fowling** replaced more organized farming.*

(9) *to all others whom they call Upland Men, who stalking on high upon stilts apply their minds to grazing, fishing and **fowling**.*

Examples (3) through (9) illustrate the types of examples that are difficult to explain in terms of the ten semantic categories listed in section 1 and to which denominal verbalization is usually referred to semantically.

In these, and in general throughout the sample of conversion, the possibility exists for a case of denominal verbalization instead of deverbal nominalization, as aimed at in the paper. The directionality that underlies this paper is here assessed precisely in terms of intralinguistic criteria, as those listed by Marchand (1963a and 1963b). Foremost among them is precisely semantic dependency of one of the pair terms upon the other in accordance with a set of known patterns. This dependency is tested by the semantic categories considered in this paper or in similar patterns based on a similar set of basic predicates. Directionality according to earliest attestation dates is not followed in this paper on account of the extralinguistic nature of this method of attestation of directionality. Thus, the entry *blare*, which the OED interprets as deverbal nominalization based on the verb's earliest attestation in the late 14th ct compared with the noun's earliest attestation in 1809, is here considered denominal verbalization if it fits any of the semantic patterns attested in the paper.

These examples also show semantic differences that may help distinguish further types. Examples (3) and (4) suggest a pattern alongside the paraphrase '*produce* X', where X comes into existence by the action of the verb. This is different from the transformation or change of a source element into a new one, as in the RESULTATIVE pattern. The contrast may be expressed in terms of a semantic category AFFECTED in the case of e.g. *disciple* compared with EFFECTED in the case of e.g. *kitten* or *receipt*:

(10) *Second, planting churches lays a foundation for **discipling** whole nations*. [BNC]
RESULTATIVE [whole nations were made into disciples]
PRODUCTIVE ? [disciples were brought into existence]

(11) *Employees receive reimbursement of such costs on the production of full details and receipted bills*. [BNC]
RESULTATIVE ≠ [bills were made into receipts]
PRODUCTIVE [receipts were brought into existence]

(12) *As the females, when they have kittened, no longer seek the company of the males*
RESULTATIVE ? [kittens were made into]
PRODUCTIVE [kittens were brought into existence]

A different case can be posited for example (4). This appears as a directional counterpart to the initial list's category of space location and, as mentioned in Section 1, is cited in the literature as one of the possible categories to be signalled in conversion. These two types of examples also find counterparts in affixation, were, e.g. *urinate* refers to the semantic role EFFECTED, like e.g. *kitten*, and *entrench* refers to the semantic role DIRECTION, like, e.g. *nightclub*. The occurrence of these counterparts is of no special significance for the contrast between processes

or affixes, but it confirms the relevance of these two semantic roles in the identification of the semantic change involved in denominal verbalization. The third case under consideration involves examples (6) through (9), of an unclear nature, and where the difficulty in referring them back to any of the patterns mentioned here may involve figurative meaning. The relevance of all of these is, according to the figures recorded in the sample, higher than that of categories that are in the conventional list of semantic categories, but the relevance of which in the sample is comparatively lower, or non-existent, as shown in Table 3:

Table 3. Percentage of occurrence of semantic categories. The conventional categories are shaded. The conventional categories that are attested to a lower degree than categories not in the conventional list are in shaded font. The categories that are not in the conventional list and are attested to a higher degree than those in the conventional list are in bold

LOCATIVE	25,02%
ORNATIVE	9,05%
CAUSATIVE	0,06%
RESULTATIVE	11,72%
INCHOATIVE	0,58%
PERFORMATIVE	13,25%
SIMILATIVE	0,75%
INSTRUMENTAL	19,63%
PRIVATIVE	0,00%
STATIVE	0,03%
EFFECTING	**3,78%**
DIRECTIONAL	**0,19%**
?	**3,91%**

3.2. The semantic patterns of N/V conversion

The figures on which Figure 3 through 8 are based reveal a considerable degree of polysemanticity according to semantic category, such that the concordances of one and the same entry lend themselves to classification in terms of several of the semantic categories under discussion, both in conversion and in the affixation considered here. This shows most clearly in *-en* suffixation, where the causative and the inchoative categories co-occur in ten entries (*darken*, *quicken*, *quieten*, *sicken*, *toughen*, *liven*, *reawaken*, *roughen*, *tauten*, *coarsen*).

At the same time, the structure of the periphrases for the semantic categories and some of the examples mentioned in Section 3.1 place the lexical meaning of the entry, represented by *X* in a syntactic frame where it performs identical syntactic and semantic functions (which is in part responsible for the abovementioned polysemanticity). Thus, e.g. the patterns INCHOATIVE and STATIVE refer to a semantic role ATTRIBUTE, dynamic and resulting in the former case and stative and current in the latter. Similarly, the categories LOCATIVE and DIRECTIONAL appear as variants of SPATIAL reference.

Avoidance of redundancy, as in the above, argues for the relevance of this type of classification in the identification of denominal conversion. The other argument for the use of such categories is precisely their adequacy for the identification of conceptual categories that are not represented in the initial list of semantic categories presented in 1. The contrast between the semantic roles AFFECTED and EFFECTED successfully fills the gap that not any of the categories that appeal to a direct object of the base verbal meaning refer to the lexical meaning of the base noun: the semantic role EFFECTED is not in the categories ORNATIVE, PERFORMATIVE, INSTRUMENTAL or PRIVATIVE. A full table of correspondences between the two types of

categories, the standard list of semantic categories and the syntactic patterns with their possible and semantic roles can be summarized as in Table 4b.

Table 4a. The correspondence between the conventional semantic categories and syntactic patterns and semantic roles. The conventional categories are shaded. Overlap by major types is marked by superscript by number

LOCATIVE	SPOA	SPACE (LOCATION) [1]
ORNATIVE	SPOO	AFFECTED [2]
CAUSATIVE	SPOCs	ATTRIBUTE (RESULTING) [3]
RESULTATIVE	SPOCs	ATTRIBUTE (RESULTING) [3]
INCHOATIVE	SPCs	ATTRIBUTE (RESULTING) [3]
PERFORMATIVE	SPOd	EVENT
SIMILATIVE	SPA	MANNER
INSTRUMENTAL	SPOd	INSTRUMENT
PRIVATIVE	SPOd	AFFECTED [2]
STATIVE	SPOCs	ATTRIBUTE (CURRENT) [3]
EFFECTING	SPOd	EFFECTED
DIRECTIONAL	SPA	SPACE (DIRECTION) [1]
?	SP, SPOd, …	AFFECTED, EVENT, …

If redundancies resolved, the table could be represented as in Table 4b to account for the semantic categories identified in the sample under study:

Table 4b. A syntactico-semantic representation of the categories identified in the study sample

SP A	Manner
	Space (Loc)
	Space (Dir)
SP Cs	Attribute (Current)
	Attribute (Resulting)
SP Od	Affected
	Effected
	Event
	Instrument
	Possessed

The advantages of this representation lie in their capacity to avoid redundancy and to allow inclusion of unrepresented types by use of semantic roles that are well-established, both within the list above but also outside it. The latter is the case of one of the examples cited in Section 1, namely *envy*^{V}, which is not represented in any of the semantic categories discussed above but can be incorporated to Tables 4a or 4b as an example of SPOd (feel envy), where the base noun performs the semantic role PHENOMENON. These categories are not without problems, and major disadvantages are that the labels it uses are not in the descriptive tradition of morphology, they are less transparent and, more important, they may prove less fine-grained than the categories currently used. The latter case can be clearly noticed in the case of the semantic role AFFECTED to account for, e.g. both the instrument and privative categories in the conventional list of categories.

4. Conclusions

The results obtained are relevant to a comparison between the semantics of denominal verbal conversion and the semantics of denominal verbal affixation, very much in line with Lee's (2009) approach to conversion parallel to verbalizing affixation, except that with the qualifications and the accuracy obtained from corpus evidence.

The distributions found in conversion and in affixation reveal relevant differences with respect to conversion, specifically as regards two semantic categories, PERFORMATIVE and INSTRUMENTAL, that may be attributed to a substantially different nature of conversion with respect to affixation, or to a substantially different nature of a hypthetical zero affix with respect to other affixes.

The semantic categories recorded evidence the need for a revision of the semantic categories traditionally listed in the literature for denominal conversion into verbs, both because some of those categories may be less likely to occur than assumed (e.g. PRIVATIVE), and because others that are not on those lists may be more likely to occur than assumed (e.g. EFFECTED). As listed in the literature, the categories are not easy to expand to cater for new instances not recorded in the literature or recorded but considered to be of comparatively minor importance. Description in terms of syntactic patterns and semantic roles may not be morphologically well-suited for this description, but it lends itself to new instances relatively easily, as in some examples presented here. These examples, like the examples in the literature, do not exhaust the list of semantic categories that denominal conversion into verbs may gain access to.

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Abbreviations

A Adverbial
Cs Subject COmplement
Od Direct Object
P Predicator
S Subject

Appendix I

Research sample, where replacing entries are shaded, irreplaceable entries are in shaded font, and entries where the occurrences listed in the frequency list and the number of occurrences retrievable from the BNC differ are in bordered cells

Conversion	***en-***	***-ate***	***-en***	***-ify***	***-ize***
960	781	1198	472	709	731
785	556	825	468	697	523
501	496	470	321	511	263
499	453	417	268	422	163
290	360	339	168	339	109
251	349	256	107	174	89
108	250	188	91	140	73
71	207	124	70	112	56
43	152	94	48	99	42
27	137	81	31	64	33
18	101	64	30	43	25
13	72	51	21	37	20
10	61	40	18	32	15
8	57	30	14	31	13
7	52	24	13	18	11
6	39	18	7	14	9
5	39	14	7	12	8
4	38	12	4	9	7
4	38	9	4	8	6
4	26	9	3	7	5
3	20	7	3	6	4
3	19	5	2	5	4
3	16	5	2	5	3
2	14	4	2	4	3
2	12	3	2	4	3
2	9	3	2	3	2
2	8	3	2	3	2
2	7	2	1	2	2
2	6	2	1	2	2
2	5	2	1	2	2
2	5	2	1	2	2
1	4	2	1	2	1
1	4	1	1	1	1
1	3	1	1	1	1
1	3	1	1	1	1
1	2	1	1	1	1
1	2	1	1	1	1
1	2	1	1	1	1
1	2	1	1	1	1
1	2	1	1	1	1
1	2	1	1	1	1
1	2	1	1	1	1
1	2	1	1	1	1
1	1	1	1	1	1
1	1	1	1	1	1
1	1	1	1	1	1
1	1	1	1	1	1
1	1	1	1	1	1
1	1	1	1	1	1
1	1	1	1	1	1
1	1	1	1	1	1