

## MARCHAND'S ANALYSIS OF BACK-FORMATION REVISITED: BACK-FORMATION AS A TYPE OF CONVERSION\*

AKIKO NAGANO

English Department  
Tsuda College  
2-1-1 Tsuda-machi, Kodaira-shi  
Tokyo 187-8577  
Japan  
nagano@tsuda.ac.jp

**Abstract:** Marchand (1960; 1969) presents a unique analysis of back-formation (e.g., *editor*<sub>N</sub> > *edit*<sub>V</sub>) as a combination of zero-derivation (*editor*<sub>N</sub> > *editor*<sub>V</sub>) and clipping (*editor*<sub>V</sub> > *edit*<sub>V</sub>). This paper will take a closer look at his analysis and argue that its revised version, which uses the notion of conversion rather than zero-derivation, is superior to the mainstream analyses of back-formation. Citing a lot of instances of back-formed verbs, we will show that back-formation does not necessarily delete an affix (e.g., *liaison*<sub>N</sub> > *liaise*<sub>V</sub>), and that it is semantically parallel not to affixation (e.g., *film*<sub>N</sub> > *filmize*<sub>V</sub>) but to conversion (e.g., *referee*<sub>N</sub> > *referee*<sub>V</sub>). Almost all the preceding analyses fail to deal with these facts, for they are based on the assumption that back-formation deletes a (supposed) affix, or it is the reverse of affixation. Our new analysis, on the other hand, is free from this traditional assumption and can account for various properties of back-formation, including the above two, in terms of general characteristics of conversion and clipping.

**Keywords:** affix deletion, back-formation, clipping, constructional iconicity, zero-derivation/conversion

\* Portions of this paper were presented at the 12th International Morphology Meeting. I would like to thank the participants for valuable comments. I am also grateful to Reiko Shimamura and my anonymous referee for sharing their knowledge and providing very helpful comments. Needless to say, all remaining inadequacies and errors are mine.

## 1. Introduction

Since it was adversely criticized by Pennanen (1966), Marchand's (1960; 1969) analysis of back-formation ("BF" hereafter), according to which BF is a kind of zero-derivation, has never been taken seriously and has been ignored in the literature. This paper aims to examine his long-forgotten analysis and show that its revised version, the hypothesis that BF is a kind of conversion rather than zero-derivation, gives us a new perspective on this seemingly marginal morphological process.

English has two types of BF, BF based on a simple word (in the sense of a one-root word) and BF involving a compound-form base. Consider the following instances of each type of BF:

- (1) (a)  $\text{beggar}_N > \text{beg}_V$ ,  $\text{liaison}_N > \text{liaise}_V$ ,  $\text{destruction}_N > \text{destruct}_V$ ,  
 $\text{laser}_N > \text{lase}_V$   
 (b)  $\text{baby-sitter}_N > \text{baby-sit}_V$ ,  $\text{brainwashing}_N > \text{brainwash}_V$ ,  
 $\text{jam-packed}_A > \text{jam-pack}_V$

The base of the first type is usually a native monomorphemic word (e.g., *beggar*), a borrowed word (e.g., *liaison*), a derived word with stem allomorphy (e.g., *destruction*), or a word formed by a process other than affixation (e.g., the acronym *laser*). On the other hand, the second type of BF is based on a compound noun or adjective, most commonly a compound noun headed by an agentive *-er* noun (e.g., *baby-sitter*), a compound noun headed by an action *-ing* noun (e.g., *brainwashing*), or a compound adjective with a participial head (e.g., *jam-packed*). Categorially, BF from N/A to V is the most productive in both types.

Traditionally, BF is described as a process based on the reanalysis of the morphological structure of a base word. For instance, *beggar*<sub>N</sub> is originally a monomorphemic word, but is reanalyzed as having the structure [[*begg*]-*ar*], based on which BF takes place and brings about *beg*<sub>V</sub>. Similarly, the original N-N compound structure of *baby-sitter*<sub>N</sub> is reanalyzed as [[[*baby*][*sit*]]*er*] or as [[*babysit*]*er*], which provides the ground for BF. Pennanen (1975, 224), Oshita (1994, 199–201), Adams (2001, 136–8), and Booij (2005, 40–1) argue for the reanalysis in BF of both types (1a, b), while Adams (1973, 105–10; 2001, 100–9) and Shimamura (1983; 1984; 1990, Chapter 5) for the reanalysis in BF of the compound type. Jespersen (1942, 537–8) uses the notion of "metanalysis," which covers not only BF but also several other linguistic processes.

Although it is a basic ingredient in the description of BF, the notion of reanalysis does not provide a theoretical account of this morphological process. We still need to elucidate what kind of theoretical system underlies BF, and what status this process has in English morphology. As we will see below, previous scholarship offers three distinct approaches to these questions: the WFR (Word Formation Rule) approach, the lexical-redundancy-rule approach, and the zero-derivation approach. After section 2 proves the synchronic relevance of BF, sections 3 and 4 will examine the first two approaches respectively, and section 5 will show that the problems of those widely accepted approaches can be solved by the third approach, the one proposed by Marchand. On the basis of his analysis, the subsequent sections will develop an analysis of BF in terms of the notion of conversion and will claim that BF is a type of conversion supplemented by a deletion process. For the most part, we will focus on N/A-to-V BF, but the other patterns will be touched upon in the last section.

The data to be used in this paper are taken from Jespersen (1942), Marchand (1960; 1963), Pennanen (1966), Adams (1973; 2001), Mencken (1977), Bauer (1983), Bauer–Huddleston (2002), and several dictionaries (the *OED*, Barnhart et al. 1973, Barnhart et al. 1990, Knowles–Elliott 1997, Ayto 1999, Matsuda 1999). We will trust these scholars for the diachronic validity of postulating a BF relation between a particular pair of words. For the sake of convenience, we will use the notation  $\langle x, y \rangle$  to represent a derivational relation between the input word  $x$  and the output word  $y$ .

## 2. BF as a synchronic process

### 2.1. Evidence for the synchronic relevance of BF

Quite a few researchers (e.g., Marchand 1960, 3; 1969, 3,<sup>1</sup> Quirk et al. 1972, 977; 1985, 1522, Aronoff 1976, 27, Kiparsky 1982, 16–8) argue that BF has a diachronic relevance only, synchronically the shorter word (e.g., *beg*) being the base and the longer word (e.g., *beggar*) the derivative. However, as Bauer (1983, 65) and Becker (1993, 6) argue, a grammar

<sup>1</sup> Marchand's (1960, 3) statement that BF has a diachronic relevance only is slightly weakened in Marchand (1969, 3), where the author states that BF often has diachronic relevance only.

that provides a new word such as *beg* must have some synchronic process that generates a shorter word from a longer word. This section aims to prove this view of BF as a synchronic word-formation process by giving concrete pieces of evidence.

The first piece of evidence is the productivity of BF. A cursory glance at a couple of new-word dictionaries reveals that back-formed words of both types in (1) are still on the increase in the vocabulary of present-day English. Ayto (1999, 6), for example, lists the following recent instances of BF:

- (2) ⟨attrition<sub>N</sub>, attrit<sub>V</sub>⟩, ⟨breathalyzer<sub>N</sub>, breathalyze<sub>V</sub>⟩, ⟨demerger<sub>N</sub>, demerge<sub>V</sub>⟩, ⟨emotion<sub>N</sub>, emot<sub>V</sub>⟩, ⟨formation<sub>N</sub>, formate<sub>V</sub>⟩, ⟨hijacker<sub>N</sub>, hijack<sub>V</sub>⟩, ⟨laser<sub>N</sub>, lase<sub>V</sub>⟩, ⟨television<sub>N</sub>, televis<sub>V</sub>⟩, ⟨air-conditioning<sub>N</sub>, air-condition<sub>V</sub>⟩

The creative power of BF is especially evident in the (1b) type. Hall (1956, 87), for example, observes that “an attentive reader and listener comes across a new [back-formed compound verb] at least every two weeks.” Haspelmath (2002, 169) reports that well over 100 neologisms of back-formed compound verbs are attested for the first half of the 20th century alone. These facts mean that English synchronic morphology admits not only attachment (e.g., affixation, compounding) and identity (e.g., conversion) but also subtraction as formal ways of producing a new word.<sup>2</sup>

The second evidence for the synchronicity of BF comes from the semantic relation between a back-formed pair of words ⟨*xa*, *x*⟩ (where *a* represents a deleted element). We should regard the longer word *xa* as the base of the shorter word *x* not only diachronically but also synchronically, because *x* semantically depends on *xa* and not vice versa. That is,

<sup>2</sup> According to Pennanen (1966, 87), BF was established as a truly productive word-formation process in the 19th century. The following table, which I have compiled from the data in Pennanen (*op.cit.*, 45–81) and the *OED*, shows the number of back-formed verbs produced in each century. As we can see, BF of the (1a) type has been more productive than BF of the (1b) type until the 19th century, which is in accord with Hall’s (1956) and Miller’s (1993, 113) observation that the productivity of back-formed compound verbs has increased after 1940’s.

	13c.	14c.	15c.	16c.	17c.	18c.	19c.	20c.	Total
BF of simple-word type	2	8	14	49	63	42	164	163	505
BF of compound type	0	2	1	13	32	18	102	257	425
Total	2	10	15	62	95	60	266	420	930

the meaning of *xa* is included in the meaning of *x*, so *xa* is the derivational base of *x*. The importance of this kind of semantic criterion in deciding the direction of a derivation is emphasized in Marchand (1963, 220), who claims that “content must be the final criterion of derivational relationship for any pair of words.” Applying this criterion to our data of BF instances, we obtain the following results (the semantic description of each verb is taken from the *OED*):

- (3) (a) butler<sub>N</sub> > buttle<sub>V</sub> ‘act as a *butler*’  
 motor<sub>N</sub> > mote<sub>V</sub> ‘use a *motor*, carry by a *motor*’  
 Rotavator<sub>N</sub> > rotavate<sub>V</sub> ‘cultivate by a *Rotavator*’  
 formation<sub>N</sub> > formate<sub>V</sub> ‘fly in a *formation*’  
 television<sub>N</sub> > televise<sub>V</sub> ‘put on *television*’  
 Quisling<sub>N</sub> > quisle<sub>V</sub> ‘act like *Quisling*’  
 luminescence<sub>N</sub> > luminesce<sub>V</sub> ‘send out *luminescence*’  
 jelly<sub>N</sub> > jell<sub>V</sub> ‘turn into *jelly*’  
 propaganda<sub>N</sub> > propagand<sub>V</sub> ‘make *propaganda*’  
 cosy<sub>A</sub> > cose<sub>V</sub> ‘make oneself *cosy*’  
 frivolous<sub>A</sub> > frivol<sub>V</sub> ‘behave in a *frivolous* manner’
- (b) typewriter<sub>N</sub> > typewrite<sub>V</sub> ‘write with a *typewriter*’  
 hang glider<sub>N</sub> > hang glide<sub>V</sub> ‘fly by a *hang glider*’  
 frostbiting<sub>N</sub> > frostbite<sub>V</sub> ‘participate in a *frostbiting* race’  
 jam-packed<sub>A</sub> > jam-pack<sub>V</sub> ‘make *jam-packed*’  
 free association<sub>N</sub> > free associate<sub>V</sub> ‘practice *free association*’  
 flower-arrangement<sub>N</sub> > flower-arrange<sub>V</sub> ‘practice *flower-arrangement*’

Crucially, in these word pairs we cannot define the meaning of the formally simple word (*x*) without referring to that of the formally complex word (*xa*); that is, *x* semantically includes *xa*. Therefore, the synchronic derivational direction of these pairs is  $xa \rightarrow x$ , rather than the other way around.<sup>3</sup>

<sup>3</sup> Note that we also have BF instances whose synchronic derivational direction is judged to be  $x \rightarrow xa$ , rather than  $xa \rightarrow x$ , by this semantic criterion. Compare the pair  $\langle \text{peddler}_N, \text{peddle}_V \rangle$  with the pair  $\langle \text{burglar}_N, \text{burgle}_V \rangle$ , for example. Diachronically they have the same status as instances of BF, but the semantic relation between *xa* and *x* is crucially different in these two pairs. As Marchand (1969, 392–3) says, while *peddler* can be analyzed as ‘one who peddles’, *burglar*

## 2.2. The validity of the semantic criterion

We have evidenced the synchronic relevance of BF by its productivity and the semantic criterion. Against this, one might object that the semantic criterion does not always lead us to a clear-cut judgment. In particular, when  $xa$  is a noun denoting an action (e.g., *injunction<sub>N</sub>*) and  $x$  a verb denoting the same action (e.g., *injunct<sub>V</sub>*), the meaning of  $xa$  defined by  $x$  (e.g., *injunction<sub>N</sub>* as “an act of injuncting”) seems to be as plausible as the meaning of  $x$  defined by  $xa$  (e.g., *injunct<sub>V</sub>* as “give an injunction”). In such a case, one might argue that the semantic criterion is of no use in determining the synchronic derivational direction.

This objection, however, does not affect the validity of our semantic argument for synchronic BF. For the majority of word pairs (including (3)), the semantic criterion tells us unambiguously which word should be counted as the base. And even when the criterion does not work as effectively as in those majority cases, its ambiguity can be resolved by other criteria of derivational direction (Iacobini 2000, 870–1), such as quantitative distribution, register, and semantic range of the words involved.

Consider the pair  $\langle \textit{injunction}_N, \textit{injunct}_V \rangle$ , for instance. As noted above, the meanings do not clarify its synchronic derivational direction. This ambiguity, however, can be resolved by the quantitative-distributional criterion (Aronoff 1976, 116–21; Iacobini 2000, 870):

---

is not ‘one who burgles’. Rather, it is *burglar* that is semantically included in *burgle*, whose meaning should be analyzed as ‘act as a burglar’. Hence, given the semantic criterion,  $\langle \textit{peddler}_N, \textit{peddle}_V \rangle$  is synchronically an instance of affixation with the direction *peddle*  $\rightarrow$  *peddler*, whereas in  $\langle \textit{burglar}_N, \textit{burgle}_V \rangle$ ,  $xa$  is the base of  $x$  both synchronically and diachronically. The instances in (3) belong to the latter type.

Instances like  $\langle \textit{editor}, \textit{edit} \rangle$ , where  $x$  has not only the meaning involving  $xa$  (e.g., ‘act as an editor’) but also the one independent of it (e.g., ‘prepare for publication’), show that the above two types are not two separate categories, but the  $\langle \textit{peddler}, \textit{peddle} \rangle$  type is a developed form of the  $\langle \textit{burglar}, \textit{burgle} \rangle$  type. Once established, a derivative starts to develop its own meaning, independent of its base. The  $\langle \textit{burglar}, \textit{burgle} \rangle$  type is at the starting point of this “semantic detachment” process, the  $\langle \textit{editor}, \textit{edit} \rangle$  type in the middle of it, and the  $\langle \textit{peddler}, \textit{peddle} \rangle$  type at its end.

(4)	[ <i>xjunction</i> ] <sub>N</sub>	[ <i>xjunct</i> ] <sub>V</sub>	[ <i>xjoin</i> ] <sub>V</sub>
	abjunction		
	adjunction		adjoin
	conjunction		conjoin
	disjunction		disjoin
	injunction	injunct	enjoin

As this paradigm shows, all the *xjunction* nouns, except *abjunction*, have the corresponding *xjoin* verb, but it is only *injunction* that has the corresponding *xjunct* verb. Given this distribution, we should analyze *injunction* as the synchronic base of *injunct*, for if we postulated a derivational process in the other direction (i.e., *injunct* → *injunction*), we could not capture the regular relationship between the *xjoin* verbs and the *xjunction* nouns. As long as *injunct* is analyzed as a BF from *injunction*, its existence does not interfere with the affixation from the *xjoin* verbs to the *xjunction* nouns.<sup>4</sup>

Additionally, this judgment is complemented by facts about register. According to the *OED*, *injunct* is restricted to the colloquial register,

<sup>4</sup> The quantitative-distributional criterion is also of use in judging a derivational relationship among the three word forms constituting the following patterns: (a) [*xvolve*]<sub>V</sub> ~ [*xvolute*]<sub>V</sub> ~ [*xvolution*]<sub>N</sub>, (b) [*xsolve*]<sub>V</sub> ~ [*xsolute*]<sub>V</sub> ~ [*xsolution*]<sub>N</sub>, and (c) [*xduce*]<sub>V</sub> ~ [*xduct*]<sub>V</sub> ~ [*xduction*]<sub>N</sub>. Consider the following three paradigms:

(a) [ <i>xvolve</i> ] <sub>V</sub> ~ [ <i>xvolute</i> ] <sub>V</sub> ~ [ <i>xvolution</i> ] <sub>N</sub>	(c) [ <i>xduce</i> ] <sub>V</sub> ~ [ <i>xduct</i> ] <sub>V</sub> ~ [ <i>xduction</i> ] <sub>N</sub>
circumvolve	circumvolution    abduce    abduct    abduction
convolve    convolute    convolution	adduce    adduct    adduction
devolve    devolute    devolution	conduce    conduct    conduction
evolve    evolute    evolution	deduce    deduct    deduction
intervolve	educate    educt    education
involve    involute    involution	induce    induct    induction
revolve    revolute    revolution	introduce    introduct    introduction
	obduce    obduct    obduction
(b) [ <i>xsolve</i> ] <sub>V</sub> ~ [ <i>xsolute</i> ] <sub>V</sub> ~ [ <i>xsolution</i> ] <sub>N</sub>	produce    product    production
absolve	reduce    reduct    reduction
dissolve    dissolute    dissolution	seduce    seduct    seduction
exsolve	subduce    subduct    subduction
resolve    resolute    resolution	transduce       transduction
solve    solute    solution	

The criterion reveals the derivational relations in the directions *xvolve*<sub>V</sub> → *xvolution*<sub>N</sub> → *xvolute*<sub>V</sub>, *xsolve*<sub>V</sub> → *xsolution*<sub>N</sub> → *xsolute*<sub>V</sub>, and *xduce*<sub>V</sub> → *xduction*<sub>N</sub> → *xduct*<sub>V</sub>, which are sometimes unclear from the semantic criterion (especially unclear in the sets *devolve*, *devolute*, *devolution* and *convolve*, *convolute*, *convolution*).

while *injunctio* and *injoin* are not. This kind of register restriction is not uncommon among back-formed words (see section 6.4). Thus, in the pair  $\langle \textit{injunctio}_N, \textit{injunct}_V \rangle$ , the quantitative-distributional criterion and the criterion based on register make up for the ambiguity of the semantic criterion, showing clearly that *injunctio* is the synchronic base of *injunct*.

The comparison of semantic range can also supplement the semantic criterion. Take the pair  $\langle \textit{wirepulling}_N, \textit{wirepull}_V \rangle$ , for instance. Although the semantic relation between *wirepulling* and *wirepull* is not clearly directional, we can legitimately postulate the synchronic BF direction from the former to the latter, given the following semantic descriptions of the words:

- |     |   |   |
|-----|---|---|
| (5) | <i>wirepulling</i> <sub>N</sub>                                 | <i>wirepull</i> <sub>V</sub>                        |
|     | (a) the act of pulling wires                                    |   |
|     | (b) the act of using secret means to achieve one's own purposes | (b') use secret means to achieve one's own purposes |

The semantic range of *wirepulling* is broader than that of *wirepull*, with the latter lacking in the (a) meaning. This fact itself argues for the status of *wirepulling* as the base of *wirepull* because generally the semantic range of a non-lexicalized derivative is narrower than that of its base (Iacobini 2000, 870). Additionally, when we consider the “cost” of specifying word meanings in the lexicon, the affixational direction *wirepull* → *wirepulling* costs higher than the opposite BF direction; analyzing *wirepull* as the base, we have to account for the occurrence of the (a) meaning of *wirepulling* in some way other than the derivation itself. On the other hand, if we derive *wirepull* from *wirepulling*, we need no such extra account.

To summarize section 2, we have claimed that BF is of synchronic relevance primarily for the following two reasons: the productivity of BF and the semantic dependence of *xa* on *x*. Even when the latter factor is less clear, the synchronic BF relation can be revealed by other direction criteria.



### 3. BF as backward application of a word formation rule

#### 3.1. Aronoff (1976)

The account of BF common in the literature is that a rule of word formation is reversed (e.g., Adams 1973, 105; Pennanen 1975, 224; Aronoff 1976, 27). We cite below Aronoff's statement as the first definition of BF:

(6) **Hypothesis A:**

[BF is] a backwards application of a WFR.

Let us see how the BF from *editor*<sub>N</sub> to *edit*<sub>V</sub> takes place under this hypothesis, using Aronoff's (1976) theory as the background framework. Since the deverbal agentive *-er* suffixation is productive in present-day English, we can posit the following WFR (Word Formation Rule):

(7) **Rule of agentive #er**

$[X]_V \rightarrow [[X]_V \#er]_N$

Base condition:  $[X]_V$  has an external argument

Semantics (roughly):  $X\#er = \text{one who } Xs$

The borrowed noun *editor* is listed in the lexicon with its syntactic, semantic, and phonological specifications. Since its properties match the output description of the WFR in (7), its *edit* part is analyzed as V and its *or* part as the agentive affix. Then, by applying the reverse of the WFR to the base *editor*, we obtain the verb *edit*.

The same account applies to the BF of a compound verb. Take the pair  $\langle \textit{baby-sitter}_N, \textit{baby-sit}_V \rangle$ , for example. *Baby-sitter* has originally the internal structure of an N-N compound. This structure, however, is lost as a result of semantic lexicalization, because "a word whose meaning is no longer derivable from that of its parts, may lose its cyclic structure" (Aronoff 1976, 26).<sup>5</sup> Then *baby-sitter* eventually ends up being listed in the lexicon (almost) as a monomorphemic word. From this monomorphemic word derives *baby-sit* in exactly the same way as the formation of *edit* from *editor* explicated above.<sup>6</sup>

<sup>5</sup> In other words, "divergences from [semantic] compositionality [...] have structural correlates" (*idem.*).

<sup>6</sup> Consider the following two ways of reanalyzing the internal structure of the compound noun *babysitter*:

So far, it appears that Hypothesis A fares fairly well. The notion of “backward application of a WFR,” however, entails (at least) two serious problems.

### 3.2. The first problem: BF without a model rule

Consider the following recent examples of BF given in Bauer (1983, 232):

- (8) transcription<sub>N</sub> > transcript<sub>V</sub>, cohesion<sub>N</sub> > cohesiv<sub>V</sub>,  
self-destruction<sub>N</sub> > self-destruct<sub>V</sub>

Bauer regards these BFs as counterexamples to Hypothesis A because if BF is the undoing of a WFR, “the expected forms of the verbs would be [...] *transcribe*, *cohere*, and *self-destroy*” (1983, 232). This argument, however, is not valid because the verbs in (8) can be analyzed as results of applying the WFR of *-(at)ion* nominalization ( $[X]_V \rightarrow [[X]_V + (at)ion]_N$ ) backwards to the input nouns.

The genuine counterexamples to Hypothesis A are BFs that do not have any corresponding WFRs. Under Hypothesis A, each BF process should correspond to some WFR in English, or its reverse pattern should exist as a WFR in English. This is not always the case. Besides the  $\langle editor_N, edit_V \rangle$  type that has a corresponding WFR, we find a lot of BF pairs that do not. They come in the following three types:

- 
- (a)  $[[baby]_N[sitter]_N]_N \rightarrow [[babysit]er]_N$   
 (b)  $[[baby]_N[sitter]_N]_N \rightarrow [babysitter]_N \rightarrow [[babysit]er]_N$

Arguing for the reanalysis in the way depicted in (a), Adams (1973, 106), Oshita (1994, 200), and Booij (2005, 41) change the original structure of an N-N compound directly into the structure of an *-er* derivative. On the other hand, our analysis, depicted in (b), assumes that a compound noun, once stored in the lexicon and lexicalized semantically, loses its internal structure and attains the status of a simple noun, only after which the WFR of *-er* suffixation provides this simple noun with the structure of an *-er* derivative, just as it provides the simple noun *editor*<sub>N</sub> with the structure of an *-er* derivative.

Very small as their difference may be, the analysis in (b) is preferable to the analysis in (a) in two respects. First, (b) captures the fact that the base of a back-formed compound verb is almost always semantically lexicalized (Shimamura 1983, 277–80; 1990, 168–73), accounting for why an N-N compound is reanalyzed as an *-er* derivative. The proponents of (a) do not account for why the structure of an N-N compound directly turns into that of an *-er* derivative. Secondly, (b) enables us to treat BF from a compound in the same way as BF from a simple word.

- (9) (a) surveillance<sub>N</sub> > surveille<sub>V</sub>, peevish<sub>A</sub> > peeve<sub>V</sub>  
 ⟨archery<sub>N</sub>, arch<sub>V</sub>⟩, ⟨bibliography<sub>N</sub>, bibliograph<sub>V</sub>⟩,  
 ⟨eclaircissement<sub>N</sub>, eclaircis<sub>V</sub>⟩, ⟨nomenclature<sub>N</sub>, nomenclate<sub>V</sub>⟩,  
 ⟨salvage<sub>N</sub>, salve<sub>V</sub>⟩, ⟨cross-reference<sub>N</sub>, cross-refer<sub>V</sub>⟩,  
 ⟨ill-treatment<sub>N</sub>, ill-treat<sub>V</sub>⟩
- (b) bruxism<sub>N</sub> > brux<sub>V</sub>, frivolous<sub>A</sub> > frivol<sub>V</sub>  
 ⟨one-upmanship<sub>N</sub>, one-upman<sub>V</sub>⟩, ⟨cathectic<sub>A</sub>, cathect<sub>V</sub>⟩, ⟨sullen<sub>A</sub>, sull<sub>V</sub>⟩
- (c) liaison<sub>N</sub> > liaise<sub>V</sub>, Bolshevik<sub>N</sub> > bolsh<sub>V</sub>  
 ⟨chauffeur<sub>N</sub>, chauffe<sub>V</sub>⟩, ⟨delirium<sub>N</sub>, delir<sub>V</sub>⟩, ⟨gondola<sub>N</sub>, gondole<sub>V</sub>⟩,  
 ⟨hokum<sub>N</sub>, hoke<sub>V</sub>⟩, ⟨Lollard<sub>N</sub>, loll<sub>V</sub>⟩, ⟨one-upmanship<sub>N</sub>, one-up<sub>V</sub>⟩,  
 ⟨Pegasus<sub>N</sub>, pegase<sub>V</sub>⟩, ⟨rotisserie<sub>N</sub>, rotisse<sub>V</sub>⟩, ⟨lysis<sub>N</sub>, lyse<sub>V</sub>⟩,  
 ⟨strumpet<sub>N</sub>, strump<sub>V</sub>⟩, ⟨ratlin(e)<sub>N</sub>, rattle<sub>V</sub>⟩, ⟨ultimatum<sub>N</sub>, ultimate<sub>V</sub>⟩,  
 ⟨rapt<sub>A</sub>, rap<sub>V</sub>⟩

In the first type, the deleted part corresponds to an unproductive suffix as in (9a); the deverbal N-forming suffix *-ance* (*ence*) and the deverbal A-forming suffix *-ish*, for example, are no longer productive in PE (Bauer–Huddleston 2002, 1700 for *-ance* (*ence*), Marchand 1969, 305 for *-ish*). Since a WFR is posited only for a process that can produce a word (Carstairs-McCarthy 1992, 33), the BF pairs in (9a) do not have a corresponding WFR (e.g.,  $*[X]_V \rightarrow [[X]_V + \text{ance}]_N$ ,  $*[X]_V \rightarrow [[X]_V + \text{ish}]_A$ ), which means that their existence cannot be accounted for by Hypothesis A.

Next, the deletion in the second type given in (9b) has no corresponding WFR because it ignores the categorial selectional property of the deleted suffix. The suffixes *-ism* and *-ous*, for instance, cannot attach to a verb as their selectional property, so there exist no **deverbal** *-ism/-ous* suffixation processes in English. This means that we do not have the WFR ( $*[X]_V \rightarrow [[X]_V + \text{ism}]_N$ ) that should produce the pair ⟨*bruxism*<sub>N</sub>, *brux*<sub>V</sub>⟩, for instance. If BF were the reverse of some affixation process, as assumed by Hypothesis A, the output category of BF should always be equal to the base category of that affixation.

The fallacy of Hypothesis A becomes even clearer when we look at the instances in (9c). In this type, the deleted part (e.g., *-on*, *-evik*) does not even exist as an affix. English does not have an affix of the form *on* or *evik*, let alone a WFR for it. The not infrequent occurrence of the (9c) type of BF suggests that we should make a radical revision of the traditional assumption about BF; BF does not necessarily delete an affix.

In brief, the first problem for Hypothesis A is the fact that BF can occur even when model WFRs do not exist; in principle, BF can occur “on its own.”

### 3.3. The second problem: the anti-iconicity of BF

Hypothesis A is also at odds with the semantics of BF. As we have proved in section 2, in the BF pair  $\langle xa, x \rangle$ , the meaning of  $x$  includes that of  $xa$ . This fact itself constitutes a fatal problem for Hypothesis A, since if the BF from  $xa$  to  $x$  is the undoing of attachment of  $a$ , the meaning of  $a$  should be deleted in accordance with its formal deletion and hence, should not be included in the meaning of  $x$ .

Let us explicate our point with the BF pair  $\langle Rotavator_N, rotavate_V \rangle$ . *Rotavator* is a proper noun formed by blending (*rotatory* + *cultivator*) and refers to a kind of cultivating machine. Back-formed from this noun, the verb *rotavate* has the meaning ‘use a Rotavator; cultivate with a Rotavator’, so its meaning clearly includes the whole meaning of *Rotavator*. This semantic inclusion relation, however, cannot be accounted for under Hypothesis A. Witness the following schemas, in which the meaning of each formal element is represented by its capitalization:

- (10) (a) Morphology: calculate plus -er(or) → calculator  
 Semantics: CALCULATE PLUS OR → CALCULATE+OR
- (b) Morphology: rotavate ← Rotavator minus -er(or)  
 Semantics: ROTAVATOR -OR ← ROTAVATOR MINUS OR

(10a) illustrates the inner workings of the WFR in (7) being applied to the verb *calculate*.<sup>7</sup> Since Aronoff’s theory is associative in Corbin’s (1990, 43) sense, the meaning of *calculator*<sub>N</sub> is determined by attaching OR to CALCULATE, in accordance with the formal process of attaching *-or* to *calculate*.

How does the semantic interpretation of the BF verb *rotavate* go? According to Hypothesis A, the BF process at hand is the reverse of deverbal *-er* suffixation, so its inner morphological and semantic workings look like (10b). Since the morphological procedure deletes *or*, the semantic procedure should associatively delete OR from ROTAVATOR. The actual

<sup>7</sup> Following the traditional analysis (e.g., Marchand 1969, 273–81), we assume that the suffix *-or* is an allomorph of the agentive suffix *-er*.

meaning of the output verb *rotavate*, however, goes against this semantic prediction; the whole meaning of *Rotavator* is left intact in its meaning.

To put it in the terms of Natural Morphology, BF is highly unnatural from the viewpoint of CONSTRUCTIONAL ICONICITY (Mayerthaler 1988, 17–20). It is anti-iconic (or counter-iconic) in the sense that a decrease in form occurs with an increase in meaning. Since WFRs of the Aronovian type presuppose constructional iconicity of word-formation processes, Hypothesis A cannot deal with this property of BF.

#### 4. BF as a process equivalent to affixation

##### 4.1. Haspelmath (2002)

The second definition of BF comes from word-based (rather than morpheme-based) morphological theories that use a bi-directional rule similar to Jackendoff's (1975) lexical redundancy rule. Haspelmath (2002, 48) calls it a "morphological correspondence", Plag (2003, 184) a "morphological schema", and Becker (1993, 1–4) a "Word Formation Rule". We adopt Haspelmath's term. These researchers analyze formal and semantic relatedness between words not as a directional base-derivative relationship but as a static pattern in the lexicon. That pattern is what a morphological correspondence rule represents.

Consider the words given in (11) below, for instance. In a word-based theory, not only simple words in (11a) but also complex words in (11b) are listed in the lexicon with their categorial, phonological, semantic, and syntactic information. And the formal and semantic relatedness between these two sets of words is captured by the bi-directional morphological correspondence rule given in (12) below, where the arrow reads as "is lexically related to" (Jackendoff *op.cit.*, 642).

- (11) (a) write, speak, walk, sing, hit, win, attack, kick...  
 (b) writer, speaker, walker, singer, hitter, winner, attacker, kicker...

$$(12) \left[ \begin{array}{c} /x/ \\ V \\ [NP_1 \text{---} ((P) NP_2)] \\ 'X' \end{array} \right] \Leftrightarrow \left[ \begin{array}{c} /x + er/ \\ N \\ [ \text{---} (P NP_2) ] \\ 'one who Xs' \end{array} \right]$$

Although correspondence rules serve primarily as "the passive description of memorized items" (*ibid.*, 668), they can also be used creatively, pro-

ducing new lexical entries (*ibid.*, 667–9). So when a new verb (e.g., *fax*<sub>V</sub>) is introduced in the lexicon with properties matching the left-hand word-schema of the rule in (12), this rule works from left to right and creates a new lexical entry belonging to the right-hand word-schema, i.e., *faxer*.

How does BF go in this approach? Interestingly enough, it turns out to have a status equivalent to affixation. This is because a morphological correspondence rule is bi-directional, so that its creative use in one direction has no priority over that in the other direction. Take the pair  $\langle \textit{editor}_N, \textit{edit}_V \rangle$ , for example. The lexicon lists *editor* beforehand. Since the lexical entry of this noun matches its right-hand word-schema, the correspondence rule in (12) works creatively from right to left and produces a new lexical entry belonging to the left-hand word-schema, i.e., *edit*. As is evident, this description of BF is in no way different from that of affixation given above. The affixation  $x \rightarrow xer$  and the BF “ $yer \rightarrow y$ ” are both based on the same correspondence rule in (12), and it is *not* the case that the latter process depends on the rule of the former process. Affixation and BF are both realization of the creativity inherent in one and the same morphological correspondence rule, differing only in their productivity; the BF use of a correspondence rule is typically less productive than its affixational use (Becker 1993, 8). Therefore, the correspondence-rule approach leads to the following definition of BF:

(13) **Hypothesis B:**

[BF is] an application of a morphological [correspondence] rule in the less productive direction. (Haspelmath 2002, 169)

#### 4.2. The first problem under Hypothesis B

This section examines how Hypothesis B deals with the first problem for Hypothesis A, namely the occurrence of BF without a model WFR. The relevant examples are given in (9a–c).

Let us start with the (9a) type, i.e., the BF whose affixation counterpart is no longer productive in PE. In contrast to Hypothesis A, Hypothesis B does not care whether a corresponding affixation is synchronically productive or not, for a correspondence rule emerges from regularities observed in words in the lexicon. So, the set of listed words in the form  $[[X]_V \textit{ance/ence}]_N$  (e.g., *acceptance*, *disturbance*, *emergence*) yields the following morphological correspondence rule:

$$(14) \left[ \begin{array}{c} /x/ \\ V \\ [NP_1 \text{---} ((P) NP_2)] \\ 'X' \end{array} \right] \Leftrightarrow \left[ \begin{array}{c} /x + \text{ance(ence)}/ \\ N \\ [ \text{---} (P NP_2) ] \\ 'act of Xing' \end{array} \right]$$

The BF pair  $\langle \textit{surveillance}_N, \textit{surveille}_V \rangle$  in (9a) is nothing but the creative use of this rule in one direction. The same applies to the other instances in (9a).

Roughly speaking, all that we need for positing a correspondence rule is the recognition of a set of words exhibiting some degree of morphological and semantic regularity.<sup>8</sup> Whether the set of words is still open (like the set of *-er* derivatives) or closed (like the sets of *-ance/ence* derivatives) does not matter to the postulation of a correspondence rule. This “generosity” enables Hypothesis B to treat the BF processes based on “dead” patterns in the same way as those based on “living” patterns.

Hypothesis B, however, cannot deal with the (9b) and (9c) types of BF, for we do not have, by the definition of these types, any sets of words in the lexicon from which we could induce relevant correspondence rules. Consider the back-formed pairs  $\langle \textit{bruxism}_N, \textit{brux}_V \rangle$  in (9b) and  $\langle \textit{liaison}_N, \textit{liaise}_V \rangle$  in (9c), for instance. There are not regularly-related sets of underived verbs and *-ism* nouns in the lexicon nor regularly-related sets of underived verbs and nouns ending in *on*. This means that there exists no correspondence rule like  $[X]_V \Leftrightarrow [Xism]_N$  or  $[X]_V \Leftrightarrow [Xon]_N$ . Hence, it is impossible for Hypothesis B to bring about the BF instances in question.

<sup>8</sup> In fact, Jackendoff (1975, 650–2) permits a redundancy rule that is purely morphological, i.e., does not entail semantic regularity. The many-to-many relationship between form and meaning widespread in the lexicon leads the author to separate M-rules (i.e., morphological redundancy rules) from S-rules (i.e., semantic redundancy rules), suggesting the possibility of admitting M-rules with no semantic correlates. (Note that S-rules with no morphological correlates are not permitted.)

In passing, Marchand (1969, 392) admits a derivational relationship between words only when they are related both in meaning and in form, which means, in Jackendoff’s terms, he refuses not only S-rules without formal correlates but also M-rules without semantic correlates. Although it is rejected by these authors, the viability of a S-rule without formal correlate, or the possibility of admitting a derivational relationship between words that are related only in meaning (e.g., *pig*<sub>N</sub> and *shoat*<sub>N</sub>) is examined positively in Carstairs-McCarthy (1992, 47–51).

### 4.3. The second problem under Hypothesis B

Let us proceed to the second problem, the anti-iconicity of BF. Of particular importance for the semantics of BF is that a morphological correspondence rule is bi-directional. As Anderson (1992, 191) notes, this kind of lexical rule describes a symmetric relation between two classes of forms rather than a simple directional change from one to the other. Thus, given an affixation pair  $\langle x, xa \rangle$  and a BF pair  $\langle ya, y \rangle$ , a correspondence rule  $[X] \Leftrightarrow [Xa]$  allows both referring to  $x$  to define  $xa$  and referring to  $ya$  to define  $y$ , in contrast to an Aronovian WFR that allows only the former.

Thus, in the case of the pair  $\langle \text{Rotavator}_N, \text{rotavate}_V \rangle$ , the bi-directionality of the correspondence rule in (12) makes it possible to look at and use the whole semantic information of *Rotavator* in interpreting *rotavate*. Hence, the fact that *rotavate* semantically includes *Rotavator* is a natural consequence of Hypothesis B.

In conclusion, Hypothesis B can fairly easily handle the “unnatural” semantic relation between a BF pair of words. In fact, under this hypothesis, the semantics of BF is as natural as that of affixation, a view that contrasts strikingly with the claim of Natural Morphology mentioned in section 3.3.

### 4.4. Hypothesis B allows too much

Analyzing BF in the correspondence-rule approach is theoretically illuminating in that it leads to the conclusion that there is nothing peculiar about BF; basically it functions exactly like “forth-formation” (Becker 1993, 7).<sup>9</sup> This conclusion, however, raises one big question. If BF is so natural as forth-formation and morphological correspondence rules are posited so generously, why is it less productive, compared with forth-formation? In other words, why is a morphological correspondence rule typically productive only in one direction?

Haspelmath (2002, 168–9) answers this question as follows: BF is relatively unproductive because the number of its input words is relatively small. When one of the word-schemas of a correspondence rule contains some highly specific constant element (such as an affix), there

<sup>9</sup> Becker (*op.cit.*, 8), for example, makes a strong argument that “the notional delimitation of back-formation is unimportant”.



are very few words matching that word-schema, apart from those that were coined by using that rule in the first place. This is why, the author claims, a correspondence rule is typically productive only in one direction. Look at the correspondence rule in (12), for instance. Haspelmath's claim is that non-derived nouns that end in the form *er* and denote the agentive meaning are much fewer than simple verbs that have an external argument. As a result, although the rule in (12) itself is neutral with respect to productivity, the BF process deleting *er* is less frequent than the forth-formation process attaching *er*.

The author goes on to claim that the notion of the number of potential input words also accounts for "why the main area of productivity of [BF] is in compounds of the type *to air condition* and *to babysit*" (*ibid.*, 168). Inputs of this type of BF, *-ing/-er* compound nouns (e.g., *air-conditioning*, *babysitter*) have the right properties that match one word-schema of the correspondence rule involving the suffix *-er/-ing*, and they are not created by that rule. Rather, they are created by the rule of N-N compounding.<sup>10</sup> This is why, the author says, *-er/-ing* compounds are a fertile ground for BF.

The problem of this argument is that it cannot handle the low productivity of the BF from non-*er/-ing* compounds (e.g.,  $\langle \textit{cross-reference}_N, \textit{cross-refer}_V \rangle$ ,  $\langle \textit{heat-treatment}_N, \textit{heat-treat}_V \rangle$ ,  $\langle \textit{ill-usage}_N, \textit{ill-use}_V \rangle$ ). Since non-*er/-ing* compounds (e.g., *street performance*) are formed by the rule of N-N compounding, just like *-er/-ing* compounds, Haspelmath's account predicts that they should equally qualify as the BF input to the rules involving relevant affixes (e.g., the rule in (14)). This prediction, however, is not borne out; compared with the BF from *-er/-ing* compounds, the BF from non-*er/-ing* compounds is much less productive

<sup>10</sup> My anonymous referee comments on this point that synthetic compounds like *air-conditioning* can be analyzed not as the output of N-N compounding but as the output of "some rather more syntax-like process that takes into account that *air* is the direct object of *condition*". I follow Haspelmath's N-N compounding analysis because in many cases, a BF compound verb's base is not a synthetic compound in that its non-head element is an adjunct rather than a direct object of its head verbal element. To cite only a few BF compound verbs, the non-heads of *spring-clean*<sub>V</sub>, *ghost-write*<sub>V</sub>, *window-shop*<sub>V</sub>, and *spoon-feed*<sub>V</sub> cannot be interpreted as direct objects of their head verbs. Comparing acceptable BF instances like  $\langle \textit{hand carving}_N, \textit{hand-carve}_V \rangle$  and  $\langle \textit{tape recorder}_N, \textit{tape-record}_V \rangle$  with unacceptable ones like  $\langle \textit{meat eating}_N, * \textit{meat-eat}_V \rangle$  and  $\langle \textit{tax payer}_N, * \textit{tax-pay}_V \rangle$ , Miller (1993, 394) argues that purely synthetic compounds, realizing a direct object-verb relation, are much more resistant to BF into a compound verb than compound nouns of an adjunct-verb relation.

(e.g., \**street-perform*). Hence, Hypothesis B overgenerates with respect to the latter type.

In sum, although it copes with the semantics of BF, Hypothesis B leaves the issue of model-less BF processes unsolved. Besides, it raises yet another problem concerning the productivity of BF; Hypothesis B “allows too much” (Bauer 2001, 77).

## 5. BF as a type of zero-derivation

### 5.1. Marchand (1960, 1969)<sup>11</sup>

We have shown that previous approaches to BF, whether they take Hypothesis A or Hypothesis B, are far from being satisfactory. Even the traditional assumption underlying them, i.e., the assumption that BF deletes an affix, has turned out to be problematic.<sup>12</sup> This section will introduce a third approach to BF, one that is free from the traditional assumption.

Recall the problem of anti- iconicity inherent in BF. BF is anti- iconic because the form decreases, but the meaning increases, not decreases. Whereas the formal operation deletes *or* from the input *Rotavator*, the output *rotavate* not only retains the whole meaning of *Rotavator* but also acquires an additional verbal meaning, in this case the instrument meaning USE. How can we account for such “peculiar” semantic interpretation of BF words?

Let us look at the problem in a bit larger perspective. In English, we can make a new verb from a nominal or adjectival base by one of the three morphological processes: affixation, conversion, and BF. The following schemas show their differences in the degree of constructional iconicity. The meaning of each word is given on the right side in capitals, and derivation proceeds from the upper word to the lower one.

<sup>11</sup> We refer to both Marchand (1960) and Marchand (1969) because the descriptions of BF are unnegligibly different in these two editions, and the former edition advances his analysis of BF as a type of zero-derivation in a stronger and more explicit manner than the latter edition.

<sup>12</sup> As far as my knowledge goes, Booij’s (2005, 40) (rather informal) definition of BF is the only previous analysis that is free from this traditional assumption. Defining BF as a “prototypical case of paradigmatic word-formation [in which] the less complex word is derived from the more complex word by omitting something” (*idem.*), he does not say that it is a (supposed) affix that is deleted in BF.

- |          |                         |                   |
|----------|-------------------------|-------------------|
| (15) (a) | film <sub>N</sub>       | FILM              |
|          | filmize <sub>V</sub>    | PUT ON FILM       |
| (b)      | catalog <sub>N</sub>    | CATALOG           |
|          | catalog <sub>V</sub>    | PUT ON CATALOG    |
| (c)      | television <sub>N</sub> | TELEVISION        |
|          | televise <sub>V</sub>   | PUT ON TELEVISION |

Affixation, as shown in (15a), is iconic in the sense that an increase in semantic complexity is reflected by an increase in formal complexity. Conversion, as in (15b), is non-iconic since semantic complexity increases with no formal change. Lastly, BF, as in (15c), is anti-iconic as we have already discussed.

It is well known that Marchand (1960, 293–306; 1969, 359–89) proposes to resolve the non-iconicity of conversion by analyzing this process as the attachment of a zero-morpheme to the base, i.e., as zero-derivation.<sup>13</sup> That is, by providing *catalog<sub>V</sub>* with the form  $[[\text{catalog}]_N + \emptyset]_V$ , we can say that an increase in meaning (i.e., the addition of the verbal location meaning PUT ON) is reflected by an increase in form (i.e., the addition of the form  $\emptyset$ ), just like the affixation in (15a), where the addition of the form *-ize* reflects the addition of the location meaning.

What is less known, however, is the fact that Marchand (1960, 310–1; 1969, 392) takes the same procedure to render BF iconic. In (15c), he attaches a zero-morpheme to the base *television* to derive the verb  $[[\text{television}]_N + \emptyset]_V$  and then “clips the pseudo-morpheme” *ion* from this derived verb. The zero-derived form  $[[\text{television}]_N + \emptyset]_V$  accounts for the peculiar semantic interpretation of *televise*. The reason *televise* semantically includes *television* and expresses the verbal (location) meaning is that its “underlying” form ( $[[\text{television}]_N + \emptyset]_V$ ), on which the semantic reading is performed, consists of the two morphemes corresponding to those two semantic elements. So, in Marchand’s view, not only conversion but also BF is classified as an iconic affixational process, and the schema in (15) should be revised as follows:

- |          |                                       |                   |
|----------|---------------------------------------|-------------------|
| (16) (a) | film <sub>N</sub>                     | FILM              |
|          | filmize <sub>V</sub>                  | PUT ON FILM       |
| (b)      | catalog <sub>N</sub>                  | CATALOG           |
|          | catalog <sub>V</sub> + $\emptyset$    | PUT ON CATALOG    |
| (c)      | television <sub>N</sub>               | TELEVISION        |
|          | television + $\emptyset$ <sub>V</sub> | PUT ON TELEVISION |
|          | (televise)                            |                   |

<sup>13</sup> The author does not use the term “iconicity”, though.

As for the deletion of the phonetic string *ion* in (16c), the author analyzes it as a kind of clipping, implying its “superficial” or “subsidiary” nature devoid of any derivational significance.

As independent evidence for the zero-derivation analysis, Marchand argues for the semantic parallelism between affixation and conversion, and that between conversion and BF. To put it more concretely, since both *filmize<sub>V</sub>* and *catalog<sub>V</sub>* have the same verbal meaning PUT ON ~, *catalog<sub>V</sub>* should have a zero-marker for this meaning corresponding to the overt marker *-ize* in *filmize<sub>V</sub>*. The same argument is applied to the pair *catalog<sub>V</sub>* and *televise<sub>V</sub>*; *catalog<sub>V</sub>* and *televise<sub>V</sub>* have the same verbal meaning and the former has a zero-marker for this meaning, hence the latter should also have one. To cite the relevant passage:

- (17) “The deriving basis is *burglar* while *burgle* is the derivative. The verb *burgle* is zero derived from *burglar*, analyzable as ‘be, act as a burglar’. It is parallel to the verb *father* derived from the substantive *father*, the only difference being the pseudo-morpheme /er/ which is clipped from *burglar*.” (Marchand 1960, 310)

Quite interestingly, Marchand’s approach to BF can deal with not only the anti- iconicity of BF but also the issue of BF without a model rule. As discussed in section 3.2, this type of BF can be classified into the following three types (see (9) for more instances):

- (18) (a) *surveillance<sub>N</sub>* > *surveil<sub>V</sub>*, *peevish<sub>A</sub>* > *peeve<sub>V</sub>*  
 (b) *bruxism<sub>N</sub>* > *brux<sub>V</sub>*, *frivolous<sub>A</sub>* > *frivol<sub>V</sub>*  
 (c) *liaison<sub>N</sub>* > *liaise<sub>V</sub>*, *Bolshevik<sub>N</sub>* > *bolsh<sub>V</sub>*

BF in (18a) deletes a non-productive affix, BF in (18b) ignores the categorial selectional property of an affix, and BF in (18c) deletes a non-affixal element. Sections 3.2 and 4.2 showed how these properties go against Hypothesis A and Hypothesis B.

Under the zero-derivation hypothesis, however, these “model-less” BF instances cause no problem because this hypothesis, unlike the other two, is free from the traditional assumption that BF deletes an affix and this deletion causes the categorial change. Instead, Marchand claims that the categorial change is caused by zero-derivation, and the deletion is nothing but clipping, a process that “consists in the reduction of a word to one of its parts” (Marchand 1969, 441). Therefore, no property of the affix deleted, whether its productivity or selectional property, affects the BF process, and neither does the affixal status of the deleted element. Just as zero-derivation derives the verb *television<sub>V</sub>* and clipping shortens

its form to *televise*, the nouns *surveillance*, *bruxism*, and *liaison*, the bases of BF in (18), undergo zero-derivation into the verbs *surveillance<sub>V</sub>*, *bruxism<sub>V</sub>*, and *liaison<sub>V</sub>*, and these zero-derived verbs undergo clipping into the shorter forms *surveille*, *brux*, and *liaise* respectively.

## 5.2. Revision of Marchand's analysis

The preceding section has introduced the third approach to BF proposed by Marchand and showed its effectiveness in dealing with the two serious problems of the approaches widely supported in the literature. Marchand's analysis, however, needs to be revised because conversion in English is not zero-derivation (Lieber 1981; 1992, sec. 5.2; 2004, chap. 3; 2005, sec. 4; Plag 1999, sec. 7.4; 2003, sec. 5.1.2). As we have seen above, Marchand bases his zero-derivation analysis of conversion on the semantic parallelism between affixation and conversion. However, this parallelism is empirically false. Certainly, the affixed and converted verbs in (15a, b) share the same verbal meaning (the location meaning), so attaching a zero-morpheme to *catalog<sub>N</sub>* as a counterpart to the overt marker *-ize* attached to *film<sub>N</sub>* might seem reasonable. But this is not always the case; converted verbs are not always semantically parallel with affixed verbs. In fact, as Table 1 proves, conversion can express much more diversified meanings than affixation, which is semantically "fixed" to the Locatum-, Location-, Goal-, and Manner-meanings.<sup>14</sup> Given this fact, we cannot reduce conversion to a type of affixation; conversion is not a zero-derivation but an independent, non-iconic morphological process.

This conclusion, in turn, negatively affects Marchand's analysis of BF as zero-derivation. As the citation in (17) shows, he posits a zero-morpheme for a back-formed verb (e.g., *televise*) as a counterpart to the zero-morpheme posited for a converted verb (e.g., *catalog<sub>V</sub>*). Therefore, if a converted verb does not have a zero-morpheme, neither does a back-formed verb.

This is not the end of the story, though. Given that conversion is not zero-derivation but an independent, non-iconic process, Marchand's analysis emerges in the following new form (19):

<sup>14</sup> The semantic groups in Table 1 are taken from Clark–Clark (1979) with slight modification. The instances of conversion are taken from this work and the *OED*, while those of affixation from Adams (2001) and the *OED*.

Table 1

Semantic comparison between affixation and conversion

Semantic group	Affixed verbs	Converted verbs
(a) Locatum	<i>vitaminize, resinify</i>	sugar, buttonhole
Locatum-with-NOT	<i>debug, disbar, uncork</i>	fleece (the sheep)
(b) Location	<i>anthologize, ghettoize</i>	lodge, bank, garage
Location-with-NOT	<i>derail, uncage, displace</i>	quarry (the marble)
(c) Goal	<i>Disneyize, mummify, amidate</i>	widow, dice, cash
(d) Manner	<i>burglarize, vampirize</i>	referee, maid, eel
(e) Instrument		canoe, rivet, scissor
(f) Duration		winter, Thanks-giving
(g) Source		piece, word, letter
(h) Meal/Crop/Weather		tea, cram, sleet
(i) Action		dart, samba, trial
(j) Sound Symbolism		meow, hiccup, wow
(k) Miscellaneous		backpack, jungle

(19) **Hypothesis C:**

BF is a type of conversion.

Even though the existence of a zero-morpheme is refuted, Marchand's analysis of BF survives in this form because the author's rationale for grouping conversion and BF together, namely the semantic parallelism between them, is not refuted.

The following schema summarizes the ongoing discussion. The arrow from process A to process B reads as 'A belongs to B; A is a type of B'.

(20)	<b>Iconic</b>	<b>Non-iconic</b>	<b>Anti-iconic</b>
	affixation	conversion	BF
	$\langle \text{film}_N, \text{filmize}_V \rangle$	$\langle \text{catalog}_N, \text{catalog}_V \rangle$	$\langle \text{television}_N, \text{televise}_V \rangle$
		①	②

Marchand argues for the arrows ① and ② on the basis of the semantic parallelism between the two processes linked, rendering all the three processes uniformly iconic. Table 1, however, has disproved arrow ① and revealed conversion to be non-iconic. What is still left open is the validity of arrow ②. Postulating this arrow makes it easier to account for the semantics of BF (i.e., it reduces the degree of deviation from strict iconicity). If BF is really semantically parallel to conversion, we can justly

entertain Hypothesis C. On the other hand, if the semantic parallelism is illusory, we have to treat BF as an independent, anti- iconic morphological process, whose (unnatural) semantics needs to be accounted for in some way. Which is empirically correct?

The following table speaks for the former possibility. It compares the semantic domains of the three V-forming processes, affixation, conversion, and BF, and shows that affixation and conversion are not semantically parallel (as we have already seen in Table 1), but conversion and BF really are.<sup>15</sup>

Table 2

Semantic comparison between affixation, conversion, and BF

Semantic group	Affixed Verbs	Converted Verbs	Back-Formed Verbs
(a) Locatum	<i>fortify</i>	marmalade	bibliograph (< bibliography)
(b) Location	<i>ghettoize</i>	lodge	televise (< television)
(c) Goal	<i>methanate</i>	cash	jell (< jelly)
(d) Manner	<i>vampirize</i>	mother	buttle (< butler)
(e) Instrument		rivet	rotavate (< Rotavator)
(f) Duration		winter	adolesce (< adolescence)
(g) Source		word	
(h) Crop/meal/weather		shrimp	tiff (< tiffin)
(i) Action		dart	aviate (< aviation)
(j) Sound		meow	
(k) Miscellaneous		jungle	york (< yorker)

This table reveals that conversion is semantically parallel to BF rather than to affixation, suggesting that arrow ② rather than arrow ① in (20) is correct.

To sum up, although it is superior to Hypothesis A and Hypothesis B, Marchand's analysis of BF should be revised in such a way as to use the notion of conversion rather than zero-derivation. Semantically, affixation and conversion are not parallel, but conversion and BF are, so conversion cannot be a type of affixation (i.e., zero-derivation), but BF can be a type of conversion (Hypothesis C). In the next section, we will develop and confirm this new hypothesis. Note that Marchand's view of deletion in BF as clipping is to be retained.

<sup>15</sup> All the verbs in Table 2 come from the *OED*.

## 6. BF as a type of conversion

Under Hypothesis C, BF consists of conversion and clipping. Conversion is a word-formation process that involves changing a word's syntactic category without any concomitant change of form (Bauer–Huddleston 2002, 1640), and clipping is a process that involves “cutting off part of an existing word or phrase to leave a phonologically shorter sequence” (*ibid.*, 1634).

BF results from these two processes. Take the BF pair of the simple-word type  $\langle television_N, televise_V \rangle$  and the BF pair of the compound type  $\langle baby-sitter_N, baby-sit_V \rangle$ , for instance. Just as conversion turns the nouns *catalog* and *chairman* into verbs ( $catalog_V$ ,  $chairman_V$ ), it turns the nouns *television* and *baby-sitter* into verbs ( $television_V$ ,  $baby-sitter_V$ ), and just as clipping shortens the forms of the nouns *cocaine* and *doctor* to the forms *coke* and *doc*, it shortens the forms of the verbs  $television_V$  and  $baby-sitter_V$  to the forms *televise* and *baby-sit*. The only difference between the converted verbs  $catalog_V$  and  $chairman_V$  and the “back-formed” verbs *televise* and *baby-sit* is that the latter have their forms “adjusted” by clipping.<sup>16</sup>

Then, if Hypothesis C is on the right track, BF should reflect general characteristics of conversion and clipping. As we have claimed above, we regard conversion not as zero-derivation but as an independent word-formation process. It has its own input- and output- properties, distinct from those of corresponding affixation (see Nagano 2002, sec. 2; 2006 for details), and its most conspicuous output trait lies in its semantic diversity suggested by Table 1; converted verbs express quite diversified meanings related to their base concepts (Clark–Clark 1979; Aronoff 1980; Lieber 1992, 163; 2004, sec. 3.2). As for clipping, we adopt the following characterization of this process found in the literature:

<sup>16</sup> Note that we cannot analyze BF as clipping followed by conversion ( $xa_N > x_N > x_V$ ) because most of the back-formed verbs do not have a nominal counterpart (e.g.,  $*televise_N$ ,  $*liaise_N$ ,  $*baby-sit_N$ ), though a clipped word can undergo conversion (e.g.,  $revolution_N > rev_N > rev_V$ ,  $photography_N > photo_N > photo_V$ ) and it makes such an analysis seemingly plausible in some cases.

Since BF is most productive in the N/A-to-V pattern, our analysis of BF as conversion followed by clipping entails that in most cases a verb is clipped into a shorter form. Although the input category of clipping in general is primarily N (e.g.,  $prof < professor$ ,  $doc < doctor$ ,  $prom < promenade$ ) and occasionally A (e.g.,  $brill < brilliant$ ,  $fab < fabulous$ ), the following *OED* instances of verbal clipping indicate that it is not impossible to clip a verb:  $dis < distribute/disrespect$ ,  $mentsh < mention$ ,  $scram < scramble$ ,  $suss < suspect$ .



- (21) (a) Clipping merely shortens the form of a word (simplex or complex), and does not change its meaning and syntactic category (Bauer 1983, sec. 7.8.1).
- (b) The way in which the form of a word is shortened is unpredictable (*ibid.*), and “the clipped part is [...] an arbitrary part of the word form” (Marchand 1969, 442).
- (c) The clipped forms often have restricted uses in that they are deployed only in informal style or even constitute slang when they are first coined (Bauer – Huddleston 2002, 1635).
- (d) “Clipping [...] has not the grammatical status that compounding, affixation, and conversion have, and is not relevant to the linguistic system (la langue) itself but to speech (la parole)” (Marchand, *loc.cit.*).

This section will confirm Hypothesis C by showing that the properties of BF can be reduced to these general properties of conversion and clipping.

### 6.1. The two problems under Hypothesis C: the model-less BF and the anti-iconicity of BF

Like Marchand’s original analysis, Hypothesis C can deal with the model-less BF instances (see (9) and (18)) and the anti-iconicity of BF. To begin with the former issue, BF can occur whether or not a corresponding affixation rule exists, because its underlying process is not reverse of affixation but conversion, an independent word-formation process. The deleted part may not be a genuine affix because the deletion in BF is nothing but clipping, which shortens the form of a word in an unpredictable way (as stated in (21b)). Next, the anti-iconicity of BF as well results from the non-iconicity of conversion being affected by the purely formal change of clipping. A back-formed verb (e.g., *rotavate*) semantically includes its base noun (e.g., *Rotavator*), because a converted verb in general semantically includes its base (e.g., the converted verb *Rotavator*<sub>V</sub> would mean “use a Rotavator”), and the shortening of its form by clipping (e.g., the shortening of *Rotavator*<sub>V</sub> to *rotavate*) does not change its meaning (as stated in (21a)).

Our analysis of the model-less BF instances might raise the following question about BF instances with affixation models: if the clipping process deletes a part of a word in an unpredictable manner, why should it be that in the unmarked instances it deletes precisely what corresponds to an affix?<sup>17</sup> As observed by several researchers (e.g., Adams 2001, 142;

<sup>17</sup> I am grateful to my anonymous referee, who brought up this question and gave me very useful suggestions.

Plag 2003, 121), back-clipping (e.g., *con* < *convict*, *deli* < *delicatessen*, *disco* < *discotheque*, *lab* < *laboratory*, *photo* < *photography*) is far more common than fore-clipping (e.g., *chute* < *parachute*, *copter* < *helicopter*), and back-clipped forms are usually one or two syllables long. The following back-clipping instances (taken from the *OED*) show that even when a base word ends in (what seems to be) a suffix, the deletion applies so as to obtain this preferred phonological pattern rather than to remove the suffix itself:

- (22) (a) *biz* < *business*, *butch* < *butcher*, *darl* < *darling*, *pud* < *pudding*, *rub* < *rubber*, *sarge* < *sergeant*, *scoot* < *scooter*, *schick* < *shicker*, *skip* < *skipper*, *tink* < *tinker*; *delish* < *delicious*, *flex* < *flexible*
- (b) *ad/advert* < *advertisement*, *ammo* < *ammunition*, *anon* < *anonymous*, *Expo* < *exposition*, *info* < *information*, *mech* < *mechanic*, *med* < *medical*, *met* < *metropolitan*, *neg* < *negative*, *prole* < *proletarian*, *recon* < *reconnaissance*, *seg* < *segregation*, *sib* < *sibilant*, *stim* < *stimulant*, *supp* < *supplement*, *tab* < *tabulator*, *tech* < *technology*, *ute* < *utility*, *vent* < *ventriloquist*

The clipping from a disyllabic “derivative” (naturally) deletes a suffix, as in (22a). When a base “derivative” has more than two syllables, however, it is often the case that material longer than a suffix is deleted as in (22b), to yield a monosyllabic or disyllabic form.

The deletion in BF is similar to the one in clipping in that it rarely removes the initial part of a base word; to the same extent as fore-clipping is rare, we have few examples of BF deleting a (pseudo-)prefix. BF differs from clipping, however, in that when a base ends in a (supposed) suffix, precisely that suffixal part alone is deleted irrespective of the base’s syllable structure. Since a BF input with a (supposed) suffix usually consists of two or three syllables but occasionally of more than three, we have not only monosyllabic and disyllabic back-forms like (23a) and (23b) but also back-forms of more than two syllables like (23c) below. The input category of the following BF instances, all taken from Pennanen (1966, ch. 4), is N or A, and the output category is V.

- (23) (a) *auth* < *author*, *awn* < *awning*, *brime* < *briming*, *coit* < *coition*, *cose* < *cosy*, *glam* < *glamour*, *google* < *googly*, *jell* < *jelly*, *laze* < *lazy*, *lech* < *lecher*, *mote* < *motor*, *mug* < *mugger*, *peeve* < *peevish*, *shab* < *shabby*, *spinst* < *spinster*, *sulk* < *sulky*, *trig* < *trigger*, *ush* < *usher*
- (b) *commote* < *commotion*, *concuss* < *consussion*, *conscript* < *conscription*, *cuttle* < *cutler*, *edit* < *editor*, *emote* < *emotion*, *excuse* < *excursion*, *frivol* < *frivolous*, *outrig* < *outrigger*, *orate* < *oration*, *reluct* < *reluctance*, *reune* < *reunion*, *romant* < *romantic*; *baby-sit* < *baby-sitter*, *back-pedal* < *back-*

pedaling, bootleg < boot-legger, fact-find < fact-finding, hand-pick < hand-picked, home-keep < home-keeping, house-warm < house-warming, lip-read < lip-reading, log-roll < log-rolling, sea-bathe < sea-bathing, shadow-box < shadow-boxing, skywrite < skywriting, sun-dry < sun-dried

- (c) perorate < peroration, hypocrise < hypocrisy, resurrect < resurrection, chiromance < chiromancy, demarcate < demarcation, evolute < evolution, locomote < locomotion, reminisce < reminiscence, resolute < resolution, phosphoresce < phosphorescent; air-condition < air-conditioning, turbosupercharge < turbosupercharger, whipper-snap < whipper-snapper

Under Hypothesis C, where the deletion process in BF is nothing but clipping, the affix-deletion in (23a, b) could be accounted for as a natural consequence of the preference of back-clipping in general for monosyllabic or disyllabic output; deleting a suffix from a BF input of two or three syllables yields an output of one or two syllables. And indeed, the majority of back-formed verbs are of one or two syllables, as a brief examination of Pennanen's (*ibid.*) comprehensive list of ME, ModE, and PE back-formed verbs, which includes both the one-word and compound types, shows. But, at the same time, the fact that BF deletes a (supposed) suffix itself even from much longer words as in (23c), unlike parallel clipping cases in (22b), suggests that something more than phonology underlies the affix-deletion tendency of BF. If it did not, the converted verb *television<sub>V</sub>* would be clipped to a shorter form such as *tele* and *tel* rather than to the attested form *televise*.

According to Marchand (1969, 446), the main reason for clipping is the "desire for shortness," and this function accounts for the mono- or di-syllabism of back-clippings in general. The main reason for clipping in BF, however, may also lie in the adjustment of a converted word's form to its category, in addition to mere shortening. When an input has a nominal or adjectival (pseudo-) suffix (e.g., *television<sub>N</sub>*), conversion to a verb yields a categorially verbal but formally nominal/adjectival output (e.g., *television<sub>V</sub>*). In such cases, conversion uses clipping to remove the categorially obstructive element, i.e., the (supposed) suffix, to adjust the output form to the output category.

In sum, as Hypothesis C predicts, BF shortens its input in more or less the same manner as clipping does; it removes the final part of the input, and the material deleted is not necessarily a morpheme. BF does delete a (supposed) suffix when the input has one, because such deletion brings about, in most cases, the preferred mono- or di-syllabism as well as the categorial adjustment of a converted form.

## 6.2. The semantic diversity of BF

Since converted verbs in general express diversified meanings, and clipping does not change the semantics, Hypothesis C predicts that back-formed verbs should exhibit semantic diversity, too. Table 2 given in section 5.2 revealed that the semantic parallelism holds between conversion and BF rather than between affixation and conversion, indicating the validity of this prediction. This section aims to confirm this semantic parallelism by providing substantial data of back-formed verbs of both types, i.e., the simple-word type and the compound type.

Let us start with back-formed verbs of the simple-word type. We present our data according to the semantic groups used in Table 2 and leave the space open when no appropriate example is found.<sup>18</sup>

- (24) (a) Locatum: automate (< automation<sub>N</sub>), bibliograph (< bibliography<sub>N</sub>), choreograph (< choreography<sub>N</sub>), jeopard (< jeopardy<sub>N</sub>), sanitize (< sanitation<sub>N</sub>), rattle (< ratline<sub>N</sub>), outrig (< outrigger<sub>N</sub>), tile (< tiler<sub>N</sub>), ultimate (< ultimum<sub>N</sub>)
- (b) Location: televise (< television<sub>N</sub>), pillor (< pillory<sub>N</sub>), cuckold (< cucking-stool<sub>N</sub>)
- (c) Goal: adolescence (< adolescence<sub>N</sub>), sullen (< sullen<sub>A</sub>), cosy (< cosy<sub>A</sub>), dishevel (< dishevelled<sub>A</sub>), dizzy (< dizzy<sub>A</sub>), duffer (< duffer<sub>N</sub>), grizzle (< grizzled<sub>A</sub>), hush (< husht<sub>A</sub>), shabby (< shabby<sub>A</sub>), maudlin (< maudlin<sub>A</sub>), rapt (< rapt<sub>A</sub>), sprightly (< sprightly<sub>A</sub>), squeamish (< squeamish<sub>A</sub>)
- (d) Manner: bolshevik (< Bolsheviki<sub>N</sub>), bum (< bumper<sub>N</sub>), buttle (< butler<sub>N</sub>), colporteur (< colporteur<sub>N</sub>), foray (< forayer<sub>N</sub>), frivol (< frivolous<sub>A</sub>), fogle (< fogleman<sub>N</sub>), haberdash (< haberdasher<sub>N</sub>), lecher (< lecher<sub>N</sub>), loll (< Lollard<sub>N</sub>), maudlin (< maudlin<sub>A</sub>), nonconform (< nonconformist<sub>N</sub>), peeve (< peevish<sub>A</sub>), quisle (< Quisling<sub>N</sub>), rancel (< rancelman<sub>N</sub>), rort (< rorty<sub>A</sub>), strump (< strumpet<sub>N</sub>)
- (e) Instrument: advect (< advection<sub>N</sub>), compute (< computer<sub>N</sub>), escalate (< escalator<sub>N</sub>), gondole (< gondola<sub>N</sub>), intuit (< intuition<sub>N</sub>), mote (< motor<sub>N</sub>), mull (< muller<sub>N</sub>), perk (< percolator<sub>N</sub>), rotavate (< Rotavator<sub>N</sub>), rotisse (< rotisserie<sub>N</sub>), schoon (< schooner<sub>N</sub>), tweeze (< tweezer<sub>N</sub>)
- (f) Duration: adolesce (< adolescence<sub>N</sub>), vacate (< vacation<sub>N</sub>) (Pennanen 1966, 125)
- (g) Source:
- (h) Meal/Crop/Weather: haze (< hazy<sub>A</sub>), nut (< nutting<sub>N</sub>) (Jespersen 1942, 101), tiff (< tiffin<sub>N</sub>)
- (i) Action: abduct (< abduction<sub>N</sub>), aviate (< aviation<sub>N</sub>), demerge (< demerger<sub>N</sub>), destruct (< destruction<sub>N</sub>), inscript (< inscription<sub>N</sub>), insurrect (< in-

<sup>18</sup> The data source is the *OED* unless otherwise specified.

surrection<sub>N</sub>), jog (< jogging<sub>N</sub>), locomote (< locomotion<sub>N</sub>), perspire (< perspiration<sub>N</sub>), propagand (< propaganda<sub>N</sub>), repercuss (< repercussion<sub>N</sub>), resurrect (< resurrection<sub>N</sub>), salve (< salvage<sub>N</sub>), skuldug (< skulduggery<sub>N</sub>)

- (j) Sound symbolism:
- (k) Miscellaneous: formate (< formation<sub>N</sub>), geomance (< geomancy<sub>N</sub>), google (< googly<sub>N</sub>), holograph (< holography<sub>N</sub>), hypocrise (< hypocrisy<sub>N</sub>), iridesce (< iridescence<sub>N</sub>), manarvel (< manarvelin<sub>A</sub>), stupend (< stupendous<sub>A</sub>), synostose (< synostosis<sub>N</sub>), vint (< vintage<sub>N</sub>), york (< yorker<sub>N</sub>)

These data show that BF from simple words expresses as various meanings as conversion does, except for the source and sound symbolic meanings (see (24g, j)). The absence of back-formed verbs with the source meaning does not bother us because converted verbs with this meaning are also rare; we have nothing but the following five examples: *letter*<sub>V</sub>, *phrase*<sub>V</sub>, *piece*<sub>V</sub>, *voice*<sub>V</sub>, *word*<sub>V</sub>.

On the other hand, it is not clear why back-formed verbs with the sound symbolic meaning are not attested. We should note, however, that BF does share with conversion the retort usage (Jespersen *op.cit.*, 105–7), which is reasonably classified into the sound-symbolic group. We give instances of BF and conversion in this usage below in (25) and (26), respectively.

- (25) (a) Belcher? and Belcher come here, I'll belch him. (*ibid.*, 106)
- (b) You will be killed: he is a prize-fighter. — I'll prize-fight him. (*idem.*)
- (26) (a) Mr. Slope, indeed! I'll Slope him. (*idem.*)
- (b) “Honey” — “Don't honey me,” she said. (Raymond Carver, “Vitamins”)

Note also that affixation does not have this retort usage.

Moreover, both conversion and BF can produce verbs with various meanings from proper nouns. As Clark and Clark (1979, 783–5) point out with instances like (27a) below, a proper noun turns into a verb easily by conversion. The instances in (27b), however, show that when it has a certain form, a proper noun turns into a verb not by conversion but by BF.

- (27) (a) My sister Houdini'd her way out of the locked closet. (*op.cit.*, 784)
- The canoe Titanicked on a rock in the river. (*ibid.*, 783)
- (b) Quisling > quisle<sub>V</sub>, Mafeking > maffick<sub>V</sub>, Diddler > diddle<sub>V</sub> (*OED*)
- Hitler > hitle<sub>V</sub> (Pennanen 1966, 56)
- “Are you fond of Kipling?” — “I might be; how do you kipple?”
- (Pennanen 1975, 220)

Let us move on to BF from compounds. Although instances are classified into a particular semantic group less unambiguously, BF from compound nouns or adjectives as well is semantically parallel to conversion. Witness the following data:<sup>19</sup>

- (28) (a) Locatum: air-condition (< air-conditioner<sub>N</sub>), face-lift (< face-lifting<sub>N</sub>), ill-treat (< ill-treatment<sub>N</sub>), ill-use (< ill-usage<sub>N</sub>), pressure-treat (< pressure-treatment<sub>N</sub>), self-destruct (< self-destruction<sub>N</sub>), triple-tongue (< triple-tonguing<sub>N</sub>), turbocharge (< turbocharger<sub>N</sub>), valet-park (< valet-parking<sub>N</sub>)
- (b) Location:
- (c) Goal: awestrike (< awestruck<sub>A</sub>), hard-boil (< hard-boiled<sub>A</sub>), horrorstrike (< horror struck<sub>A</sub>), jam-pack (< jam-packed<sub>A</sub>), jerrybuild (< jerrybuilt<sub>A</sub>), sunburn (< sunburnt<sub>A</sub>), tailor-make (< tailor-made<sub>A</sub>), thunderstrike (< thunderstruck<sub>A</sub>), tongue-tie (< tongue-tied<sub>A</sub>)
- (d) Manner: art-edit (< art-editor<sub>N</sub>), baby-sit (< baby-sitter<sub>N</sub>), jay-hawk (< jay-hawker<sub>N</sub>), match-make (< match-maker<sub>N</sub>), ring-lead (< ring-leader<sub>N</sub>), slave-drive (< slave-driver<sub>N</sub>), stage-manage (< stage-manager<sub>N</sub>), supply-teach (< supply-teacher<sub>N</sub>), trend-set (< trend-setter<sub>N</sub>), tub-thump (< tub-thumper<sub>N</sub>), whipper-snap (< whipper-snapper<sub>N</sub>), wiredraw (< wiredrawer<sub>N</sub>)
- (e) Instrument: hang glide (< hang glider<sub>N</sub>), knuckle-dust (< knuckle-duster<sub>N</sub>), loud-hail (< loud-hailer<sub>N</sub>), pile-drive (< pile-driver<sub>N</sub>), self-feed (< self-feeder<sub>N</sub>), tape-record (< tape-recorder<sub>N</sub>), vacuum-clean (< vacuum-cleaner<sub>N</sub>), word-process (< word-processor<sub>N</sub>)
- (f) Duration:
- (g) Source:
- (h) Crop: bird's-nest (< bird's-nesting<sub>N</sub>) (Jespersen 1942, 101)
- (i) Action: (i) book-hunt (< book-hunting<sub>N</sub>), hand-write (< hand-writing<sub>N</sub>), house-clean (< house-cleaning<sub>N</sub>), house-keep (< house-keeping<sub>N</sub>), job-hunt (< job-hunting<sub>N</sub>), kite-fly (< kite-flying<sub>N</sub>), map-read (< map-reading<sub>N</sub>), pan-broil (< pan-broiling<sub>N</sub>), queue-jump (< queue-jumping<sub>N</sub>), safe-keep (< safe-keeping<sub>N</sub>), scat-sing (< scat-singing<sub>N</sub>), sun-bathe (< sun-bathing<sub>N</sub>), thought-read (< thought-reading<sub>N</sub>)  
 (ii) affix-hop (< affix-hopping<sub>N</sub>), brainstorm (< brainstorming<sub>N</sub>), die-cast (< die-casting<sub>N</sub>), dry-farm (< dry-farming<sub>N</sub>), name-drop (< name-dropping<sub>N</sub>), phase-modulate (< phase-modulation<sub>N</sub>), pied-pipe (< pied-piping<sub>N</sub>), possessor-raise (< possessor-raising<sub>N</sub>), Red-bait (< Red-baiting<sub>N</sub>), role-play (< role-playing<sub>N</sub>), role-take (< role-taking<sub>N</sub>), shoplift (< shoplifting<sub>N</sub>), sight-see (< sight-seeing<sub>N</sub>), soft-land (< soft-landing<sub>N</sub>), sound-substitute (< sound-substitution<sub>N</sub>), surf-cast (< surf-casting<sub>N</sub>), time-share (< time-sharing<sub>N</sub>), trickle-irrigate (< trickle-irrigation<sub>N</sub>), type-cast (< type-casting<sub>N</sub>), wh-move (< wh-movement<sub>N</sub>), window-shop (< window-shopping<sub>N</sub>)

<sup>19</sup> The data source is the *OED* unless otherwise specified. Linguistic terms found in (28i), however, are taken from the literature of linguistics.

- (j) Sound symbolism: prize-fight (<prize-fighter<sub>N</sub>) (= (23b))
- (k) Unclassifiable: cliff-hang (<cliff-hanger<sub>N</sub>), frostbite (<frostbiting<sub>N</sub>) (Matsuda 1999), logroll (<logrolling<sub>N</sub>), show-jump (<show-jumping<sub>N</sub>), shadow-cast (<shadow-casting<sub>N</sub>), skywrite (<skywriting<sub>N</sub>)

A few remarks are in order concerning this semantic classification of back-formed compound verbs.

First of all, the absence of compound verbs with the location-, duration-, and source-meanings (see (28b, f, g)) is a natural consequence of the fact that few *-er/-ing* compound nouns denote place or time.

Next, consider the manner group given in (28d) and the action group given in (28i). As we mentioned in section 4.4, most of the back-formed compound verbs are based on compound nouns headed by agentive *-er* nouns and action *-ing* nouns. Accordingly, these semantic groups, the action-group in particular, enjoy the largest number of instances.

The action group divides into subgroups (i) and (ii) according to the degree of “descriptiveness” of the meaning of their bases. Base compounds of the (28i, i) group function as descriptions of a particular action, whereas those of the (28i, ii) group function as names of a particular action.<sup>20</sup> As a result of this semantic difference in their bases, the meanings of the (i) group are purely transpositional, whereas some of the (ii) group, as an indication of their base being a “tangible” name, admit of alternative semantic classification as the locatum group.

Importantly for us, both the high productivity of the manner- and action-groups and the descriptiveness difference among base words are not peculiar to BF, but also found in conversion.<sup>21</sup>

In sum, the data provided in this section confirm the semantic parallelism between conversion and BF.<sup>22</sup> They show that a back-formed verb

<sup>20</sup> For instance, *safe-keeping*, the base of the compound verb *safe-keep*, is more descriptive than the compound noun *window-shopping* (the base of the compound verb *window-shop*), which serves as a definite name of a particular activity. Our claim that input nouns of the (28i,ii) group function as names receives support from the fact that many of them are technical terms from various disciplines.

<sup>21</sup> My research on N-to-V conversion (Nagano 2002, 217) revealed that the action group is the most productive semantic group in conversion in PE. Among 547 new converted verbs formed in the 20th century, the action group accounts for the largest proportion, numbering 93 in total.

<sup>22</sup> The discussion in Sugioka–Kobayashi (1999, 263–8) provides another argument for semantic parallelism between BF and conversion. They reveal that in English the BF process of compound verbs (e.g., ⟨*charcoal-broiling*<sub>N</sub>, *charcoal-broil*<sub>V</sub>⟩)

expresses the meaning that conversion of its base would bring about, which is exactly what Hypothesis C predicts.

### 6.3. Doublet verbs of BF and conversion

As an important fact that has escaped the attention of previous researchers, not a few back-formed verbs have a converted counterpart; BF and conversion often form doublet verbs, as shown below.<sup>23</sup>

(29)	Input	Converted Verb	Back-Formed Verb
(a)	harbinger <sub>N</sub>	harbinger <sub>V</sub>	harbinge <sub>V</sub>
	butler <sub>N</sub>	butler <sub>V</sub>	buttle <sub>V</sub>
	janitor <sub>N</sub>	janitor <sub>V</sub>	jan <sub>V</sub>
	chauffeur <sub>N</sub>	chauffeur <sub>V</sub>	chauffe <sub>V</sub>
	usher <sub>N</sub>	usher <sub>V</sub>	ush <sub>V</sub>
	carpenter <sub>N</sub>	carpenter <sub>V</sub>	carpent <sub>V</sub>
	broker <sub>N</sub>	broker <sub>V</sub>	broke <sub>V</sub>
	butcher <sub>N</sub>	butcher <sub>V</sub>	butch <sub>V</sub>
	author <sub>N</sub>	author <sub>V</sub>	auth <sub>V</sub>
	caddy <sub>N</sub>	caddy <sub>V</sub>	cad <sub>V</sub>
	martyr <sub>N</sub>	martyr <sub>V</sub>	mart <sub>V</sub>
	liaison <sub>N</sub>	liaison <sub>V</sub>	liaise <sub>V</sub>
	lazy <sub>A</sub>	lazy <sub>V</sub>	laze <sub>V</sub>
	shabby <sub>A</sub>	shabby <sub>V</sub>	shab <sub>V</sub>
(b)	motor <sub>N</sub>	motor <sub>V</sub>	mot <sub>V</sub>
	jelly <sub>N</sub>	jelly <sub>V</sub>	jell <sub>V</sub>
	attrition <sub>N</sub>	attrition <sub>V</sub>	attrit <sub>V</sub>
	vacation <sub>N</sub>	vacation <sub>V</sub>	vacate <sub>V</sub>
	salvage <sub>N</sub>	salvage <sub>V</sub>	salve <sub>V</sub>
	sculpture <sub>N</sub>	sculpture <sub>V</sub>	sculpt <sub>V</sub>
	sullen <sub>A</sub>	sullen <sub>V</sub>	sully <sub>V</sub>
(c)	bartender <sub>N</sub>	bartender <sub>V</sub>	bartend <sub>V</sub>
	cross-reference <sub>N</sub>	cross-reference <sub>V</sub>	cross-ref <sub>V</sub>
	roller-coaster <sub>N</sub>	roller-coaster <sub>V</sub>	roller-coast <sub>V</sub>

---

and the (N-to-V) conversion process (e.g., ⟨*pen*<sub>N</sub>, *pen*<sub>V</sub>⟩) constitute complex predicate formation at the level of LCS (Lexical Conceptual Structure), which is realized as one type of compound verb in Japanese (e.g., *sumibi-yaki* ‘charcoal-broil’, *penn-gaki* ‘pen-write’).

<sup>23</sup> The doublet data in (29) is collected from Marchand (1960; 1969), Penanen (1966), Mencken (1977), and the *OED*.



The nouns or adjectives in the leftmost column have two different verb forms, one by conversion and the other by BF, and significantly, each verb pair has the same meaning. The pairs in (29a) express the manner-meaning, while those in (29b) share other specific meanings respectively. The instances in (29c) show that even a compound base can bring about the BF/conversion doublet.<sup>24</sup> The existence of these doublet verbs strongly speaks for our claim that a converted form underlies a back-formed form.

Under Hypothesis C, the co-occurrence of the two verb forms is reduced to the non-rule-governedness or unpredictability of clipping; a converted form occurs when clipping does not occur. As the statement in (21d) indicates, clipping is not a rule-based word-formation process but a (rather) unsystematic word-creation process, and its application depends on such extra-grammatical factors as a speaker's word-analysis and intention (Booij 2005, 20–2). Then, depending on those factors, a converted verb may go “unadjusted” by clipping in some cases or go on to clipping in other cases, yielding doublet verbs like (29). To put it more plainly, a back-formed verb may have a converted rival because clipping is not a systematic grammatical process and does not apply necessarily; we have the doublet verbs *usher*<sub>V</sub> and *ush*<sub>V</sub> for the same reason that we have the doublet nouns *doctor* and *doc*.

<sup>24</sup> Hypothesis C enables us to deal with the apparently surprising fact that even BF from a compound form is sometimes rivaled by conversion. As long as we restrict our data source to the literature or dictionaries, almost all the doublet instances come in the non-compound form, as in (29a, b). A quick search on the Internet, however, reveals that this does not mean that a compound noun (with a suffixal ending) is always verbalized by BF. Consider the following BF/conversion doublets collected by a Google search:

- (i) ⟨air-conditioner<sub>N</sub>, air-condition<sub>V</sub>/air-conditioner<sub>V</sub>⟩, ⟨baby-sitter<sub>N</sub>, baby-sit<sub>V</sub>/baby-sitter<sub>V</sub>⟩, ⟨chain-reaction<sub>N</sub>, chain-react<sub>V</sub>/chain-reaction<sub>V</sub>⟩, ⟨cheer-leader<sub>N</sub>, cheerlead<sub>V</sub>/cheerleader<sub>V</sub>⟩, ⟨cliff-hanger<sub>N</sub>, cliff-hang<sub>V</sub>/cliff-hanger<sub>V</sub>⟩, ⟨home-delivery<sub>N</sub>, home-deliver<sub>V</sub>/home-delivery<sub>V</sub>⟩, ⟨stage-manager<sub>N</sub>, stage-manage<sub>V</sub>/stage-manager<sub>V</sub>⟩, ⟨word-processor<sub>N</sub>, word-process<sub>V</sub>/word-processor<sub>V</sub>⟩

Although the converted form in (i) occurs much less frequently than the back-formed form, its (previously unnoticed) existence proves the parallelism between BF and conversion.

#### 6.4. The peculiarities of back-formed words

The clipping process also accounts for the fact that back-formed forms sometimes show “unnatural” or “marked” properties, properties that the output of a rule-governed word-formation process would not have. Firstly, quite a few BF instances are restricted in stylistic usage. As Pennanen (1966, 132) points out for BF of the simple-word type, and Hall (1956, 86–7), Marchand (1969, 106), Adams (1973, 112), and Shimamura (1984, 81) for BF of the compound type, many back-formed verbs are limited in use to a colloquial style or slang, and they are sometimes used with humorous intention. Secondly, the acceptability judgment of a given back-formed word may vary from one native speaker to another. For instance, Shimamura (1983, sec. 5) reports that her eleven informants (nine from the United States, two from Canada) reacted to back-formed compound verbs differently and incoherently, nine of them accepting the BF verb *baby-sit*, four of them *typewrite*, and only one of them *finger-catch* (to cite only a few cases). Such an acceptability variation makes a clear contrast with the stable and coherent judgments Shimamura’s informants gave to the base compound nouns or adjectives (e.g., *baby-sitter*, *typewriter*, *finger-catching*).

These peculiarities of BF output, which are absent from the output of rule-based word-formation processes such as affixation, compounding, and conversion, can be reduced to the peculiarities of clipped forms in general. Clipping as well has the stylistic value of informality or slanginess, as stated in (21c), and native speakers react to different clipped forms differently; the acceptability of *tu* (from *tuition*), *loot* (from *lieutenant*), *dinah* (from *dynamite*), and *poly* (from *politician*), for instance, are judged differently among native speakers (Marchand 1969, 442). The markedness of BF is strictly parallel to that of clipping, and this fact is exactly what Hypothesis C predicts.

In short, BF under Hypothesis C consists of conversion, a rule-governed word-formation process, and clipping, a non-rule-governed speech-level process (see (21d)), so that back-formed verbs exhibit peculiar properties absent from affixed verbs or converted verbs. To use the doublet instances in (29a), English speakers will uniformly accept *usher<sub>V</sub>* but will differ in their reactions to *ush<sub>V</sub>*, and *auth<sub>V</sub>* and *mart<sub>V</sub>* will be accepted by a restricted number of speakers or within a restricted register, making a sharp contrast with the stable acceptability that their converted counterparts *author<sub>V</sub>* and *martyr<sub>V</sub>* enjoy.

### 6.5. BF in L1 acquisition

The last piece of evidence for Hypothesis C comes from L1 acquisition data; conversion covers the domain of BF in children's grammar. Clark (1993, 202–5; 2003, 290) gives the following denominal verbs produced by English-speaking children, which should be compared with the parenthesized adult forms:

- (30) (a) (2;3) to *buzzer* (cf. *buzz*)  
 (3;5) (of a prayer book) He *prayers* with it. (cf. *pray*)  
 (4;11) (of the Christmas tree) We already *decorated* our tree.  
 (cf. *decorate*)  
 (5;9) Can I *stroller* Damon?
- (b) (3;6) I'm gonna *lawnmower* you.  
 (4;9) Can I *typewriter* on your typewriter or Daddy's? (cf. *typewrite*)  
 (5;3) Don't *vacuum-cleaner* in the backyard. (cf. *vacuum-clean*)

To make a verb from a noun, English-speaking children predominantly use conversion (Clark 1993, 198–205), and as the above data show, they do so even where adult speakers use BF. This fact follows naturally from Hypothesis C if they have not learned clipping yet, and it predicts that BF will emerge when they learn the necessity of “adjusting” the forms of certain converted words by clipping.

## 7. BF processes other than the N/A-to-V pattern

This section briefly looks at BF other than N/A-to-V pattern. The literature (Jespersen 1942; Marchand 1960; 1969; Pennanen 1966, ch. 4; Adams 1973; 2001) presents the following instances as BF pairs:

- (31) (a) Adjective → Noun  
 ⟨epileptic, epilept⟩, ⟨greedy, greed⟩, ⟨petty, pet⟩, ⟨tatty, tat⟩, ⟨unsurprising, unsurprise⟩, ⟨illogical, illogic⟩, ⟨unrepaired, unrepair⟩, ⟨unsuccessful, unsuccess⟩, ⟨paramedical, paramedic⟩, ⟨poly-angular, poly-angle⟩, ⟨multi-hulled, multi-hull⟩
- (b) Adverb → Adjective  
 ⟨sideling, sidle⟩, ⟨darkling, darkle⟩, ⟨aslant, slant⟩, ⟨gingerly, ginger⟩
- (c) Noun → Adjective  
 ⟨homesickness, homesick⟩, ⟨greensickness, greensick⟩, ⟨gullibility, gullible⟩

The three patterns are arranged in decreasing order of the number of examples. Compared with BF from nouns/adjectives to verbs, these patterns are much less productive; in fact, it seems highly plausible that they can no longer produce a new word. Pennanen's (1966:, ch. 5) diachronic study on BF shows that they are sporadic, occasional formations, and that over 87% of all the ME, ModE, and PE instances of BF are in the N/A-to-V pattern. Then, we may suppose that BF is synchronically productive (i.e., can produce a new word) only in this pattern. As correctly predicted from Hypothesis C, such productivity differences among BF patterns correlate with those among conversion patterns; the N/A-to-V pattern is predominant in conversion too (Bauer 1983, sec. 7.6.4).

### 8. Conclusion

This paper has examined what system underlies BF in English. The WFR approach (Hypothesis A), the lexical-redundancy-rule approach (Hypothesis B), or even the most traditional analysis of BF as affix-deletion has been shown to be an inadequate answer to this issue, in view of the occurrence of many "model-less" BF pairs of words and the anti-iconicity of BF. We have then shown that the revised version of Marchand's (1960; 1969) zero-derivation approach to BF, namely Hypothesis C, can not only deal with these two problems, but also account for other properties of back-formed words, including their semantic diversity, their rivalry with converted forms, and their restrictedness in style as well as in acceptability. According to Hypothesis C, BF consists of conversion, a rule-based word-formation process, and clipping, a non-rule-based speech-level process, and the various properties of BF have been proved to be deducible from the properties of these two processes.<sup>25</sup>

<sup>25</sup> Hypothesis C entails a sort of precedence relation between conversion and BF. That is, the existence of BF in a language depends on the existence of conversion, or to put it more simply, BF is possible only when conversion is possible. This prediction seems to be valid from the viewpoint of Natural Morphology (e.g., Mayerthaler 1988; Dressler 1987). Dressler (*op.cit.*, 104–10), for example, presents the following predictions about the cross-linguistic distribution of "WF (Word Formation) techniques":

- (i) a first prediction: Iconic affixation technique should be more frequent than non-iconic conversion techniques in the languages of the world, and anti-iconic subtractive techniques are most unusual.

We have assimilated BF into conversion by analyzing its deletion as clipping. Suppose that this clipping is applied to a converted form in order to adjust its form to its categorial value. For instance, in the BF pairs  $\langle television_N, televise_V \rangle$  and  $\langle baby-sitter_N, baby-sit_V \rangle$ , the base nouns are converted into the verbs  $television_V$  and  $baby-sitter_V$ , and these verbs are formally adjusted by clipping because their endings *ion* and *er*, (supposed) nominal markers, conflict with their syntactic category V. If this view of clipping in BF, i.e., clipping as formal adjustment of a converted verb for its (more explicit) categorial recognition, is further pursued, the possibility arises that not only BF (in (32a) below) but also word-formations like (32b–d) below can be subsumed under conversion.

- (32) (a) clipping e.g.,  $\langle television_N, televise_V \rangle$ ,  $\langle baby-sitter_N, baby-sit_V \rangle$   
 (b) head-replacement e.g.,  $\langle spoon-fed_A, spoon-feed_V \rangle$ ,  $\langle head-adjunction_N, head-adjoin_V \rangle$   
 (c) final voicing e.g.,  $\langle calf_N, calve_V \rangle$ ,  $\langle house_N, house_V /haʊz/ \rangle$   
 (d) stress shifting e.g.,  $\langle permit_V, pɛrmit_N \rangle$ ,  $\langle give\ away_V, giveway_N \rangle$

(32a) is the traditional BF discussed in this paper, that is, BF as conversion plus clipping. (32b) is also treated as BF in the literature, but it involves head-replacement rather than clipping. The categorial change in (32c) and (32d) is accompanied by final voicing and stress shifting, respectively. Our suggestion is that each of these morphophonological processes can be analyzed as supplements to conversion, purely formal operations which adjust the form of the conversion output to its categorial value. Clipping in (32a) deletes a categorially obstructive ending (e.g., *ion*, *er*) from a converted verb (e.g.,  $television_V$ ,  $baby-sitter_V$ ), head-replacement in (32b) replaces the head of a converted verb (e.g.,  $spoon-fed_V$ ,  $head-adjunction_V$ ) with its categorially more appropriate form, i.e., its root-verb form, and final voicing in (32c) and stress shifting in (32d) contribute to the more explicit categorization by bringing a clear phonological distinction between the input (e.g.,  $calf_N$ ,  $permit_V$ ) and output (e.g.,  $calve_V$ ,  $pɛrmit_N$ ) of conversion.

Although it requires stricter formalization, our analysis given above simplifies the word-formation component in English. We do not have to posit different word-formation processes for the instances in (32a–d),

---

(ii) a stronger prediction: If a language uses a technique of anti-iconic subtraction, it also uses techniques of non-iconic conversion; if it uses a technique of conversion, it also uses techniques of iconic affixation.

for they all belong to conversion. The only difference between these instances and the traditional conversion instances (e.g.,  $\langle \textit{catalog}_N, \textit{catalog}_V \rangle$ ,  $\langle \textit{chairman}_N, \textit{chairman}_V \rangle$ ) is whether supplementary formal adjustment (such as clipping) applies to the conversion output or not.

### References

- Adams, Valerie 1973. An introduction to Modern English word formation. Longman, London.
- Adams, Valerie 2001. Complex words in English. Pearson Education, Harlow.
- Anderson, Stephen R. 1992. A-morphous morphology. Cambridge University Press, Cambridge.
- Aronoff, Mark 1976. Word formation in generative grammar. MIT Press, Cambridge MA.
- Aronoff, Mark 1980. Contextuals. In: *Language* 56: 744–58.
- Ayto, John (ed.) 1999. Twentieth century words. Oxford University Press, Oxford.
- Barnhart, Clarence L. – Sol Steinmetz – Robert K. Barnhart (eds) 1973. A dictionary of New English 1963–1972. Longman, London.
- Barnhart, Robert K. – Sol Steinmetz – Clarence L. Barnhart (eds) 1990. The third Barnhart dictionary of New English. H. W. Wilson, New York.
- Bauer, Laurie 1983. English word-formation. Cambridge University Press, Cambridge.
- Bauer, Laurie 2001. Morphological productivity. Cambridge University Press, Cambridge.
- Bauer, Laurie – Rodney Huddleston 2002. Lexical word-formation. In: Rodney Huddleston – Geoffrey K. Pullum (eds): *The Cambridge grammar of the English language, 1621–721*. Cambridge University Press, Cambridge.
- Becker, Thomas 1993. Back-formation, cross-formation, and “bracketing paradoxes” in Paradigmatic Morphology. In: Geert Booij – Jaap van Marle (eds): *Yearbook of morphology 1993*, 1–25. Kluwer, Dordrecht.
- Booij, Geert 2005. *The grammar of words: An introduction to linguistic morphology*. Oxford University Press, Oxford.
- Carstairs-McCarthy, Andrew 1992. *Current morphology*. Routledge, London & New York.
- Clark, Eve V. 1993. The lexicon in acquisition. Cambridge University Press, Cambridge.
- Clark, Eve V. 2003. *First language acquisition*. Cambridge University Press, Cambridge.
- Clark, Eve V. – Herbert H. Clark 1979. When nouns surface as verbs. In: *Language* 55: 767–811.
- Corbin, Danielle 1990. Associativité et stratification dans la représentation des mots construits. In: Wolfgang U. Dressler (ed.): *Contemporary morphology*, 43–59. Mouton de Gruyter, Berlin & New York.

- Dressler, Wolfgang U. 1987. Word formation as part of Natural Morphology. In: Wolfgang U. Dressler (ed.): *Leitmotifs in natural morphology*, 99–126. John Benjamins, Amsterdam & Philadelphia.
- Hall, Robert A. Jr. 1956. How we noun-incorporate in English. In: *American Speech* 31: 83–8.
- Haspelmath, Martin 2002. *Understanding morphology*. Arnold, London.
- Iacobini, Claudio 2000. Base and direction of derivation. In: Geert Booij – Christian Lehmann – Joachim Mugdan (eds): *Morphology: An international handbook on inflection and word-formation*, 865–76. Walter de Gruyter, Berlin.
- Jackendoff, Ray 1975. Morphological and semantic regularities in the lexicon. In: *Language* 51: 639–71.
- Jespersen, Otto 1942. *A Modern English grammar on historical principles, Part VI: Morphology*. Ejnar Munksgaard, Copenhagen.
- Kiparsky, Paul 1982. Lexical morphology and phonology. In: I. S. Yang (ed.): *Linguistics in the morning calm: Selected papers from SICOL-1981*, 3–91. Hanshin Publishing Company, Seoul.
- Knowles, Elizabeth – Julia Elliott 1997. *The Oxford dictionary of new words*. Oxford University Press, Oxford.
- Lieber, Rochelle 1981. Morphological conversion within a restrictive theory of the lexicon. In: Michael Moortgat – Harry van der Hulst – Teun Hoekstra (eds): *The scope of lexical rules*, 161–200. Foris, Dordrecht.
- Lieber, Rochelle 1992. *Deconstructing morphology*. Chicago University Press, Chicago.
- Lieber, Rochelle 2004. *Morphology and lexical semantics*. Cambridge University Press, Cambridge.
- Lieber, Rochelle 2005. English word-formation processes: Observations, issues, and thoughts on future research. In: Pavol Štekauer – Rochelle Lieber (eds): *Handbook of word-formation*, 375–427. Springer, Dordrecht.
- Marchand, Hans 1960. *The categories and types of present-day English word-formation: A synchronic-diachronic approach*. Otto Harrassowitz, Wiesbaden.
- Marchand, Hans 1963. On content as a criterion of derivational relationship with back-derived words. In: *Indogermanische Forschungen* 68: 170–5. (Reprinted in *Studies in syntax and word-formation: Selected articles by Hans Marchand*, ed. by Dieter Kastovsky, 1974, 218–23, Fink, Munich.)
- Marchand, Hans 1969. *The categories and types of present-day English word-formation: A synchronic–diachronic approach (Second edition)*. C. H. Beck, Munich.
- Matsuda, Tokuichiro (ed.) 1999. *Kenkyusha's English–Japanese dictionary for the general reader*. Kenkyusha, Tokyo.
- Mayerthaler, Willi 1988. *Morphological naturalness*. Karoma, Ann Arbor. (Translation of *Morphologische Naturlichkeit*, 1981, Athenaion, Wiesbaden, by Janice Seidler.)
- Mencken, Henry Louis 1977. *The American language: An inquiry into the development of English in the United States (Fourth edition)*. Alfred A. Knopf, New York.

- Miller, D. Gary 1993. Complex verb formation. John Benjamins, Amsterdam & Philadelphia.
- Nagano, Akiko 2002. Zero-V formation in English: Conversion or derivation? MA thesis, Tsuda College, Tokyo.
- Nagano, Akiko 2006. The status of back-formation and morpheme-basedness of English morphology. In: *English Linguistics* 23: 247–278.
- OED 1994. The Oxford English dictionary (Second edition, on compact disc). Oxford University Press, Oxford.
- Oshita, Hiroyuki 1994. Compounds: A view from suffixation and a-structure alternation. In: Geert Booij – Jaap van Marle (eds): *Yearbook of morphology 1994*, 179–205. Kluwer, Dordrecht.
- Pennanen, Esko V. 1966. Contributions to the study of back-formation in English. *Acta Academiae Socialis*, Tampere.
- Pennanen, Esko V. 1975. What happens in back-formation? In: Even Hovdhaugen (ed.): *Papers from the Second Scandinavian Conference of Linguistics*, 216–99. Oslo University, Department of Linguistics, Oslo.
- Plag, Ingo 1999. Morphological productivity: Structural constraints on English derivation. Mouton de Gruyter, Berlin & New York.
- Plag, Ingo 2003. *Word formation in English*. Cambridge University Press, Cambridge.
- Quirk, Randolph – Sidney Greenbaum – Geoffrey Leech – Jan Svartvik 1972. *A grammar of contemporary English*. Longman, London.
- Quirk, Randolph – Sidney Greenbaum – Geoffrey Leech – Jan Svartvik 1985. *A comprehensive grammar of English*. Longman, London.
- Shimamura, Reiko 1983. Back-formation of English compound verbs. In: John F. Richardson – Mitchell Marks – Amy Chukerman (eds): *Papers from the parasession on the interplay of phonology, morphology, and syntax*, 271–82. Chicago Linguistic Society, Chicago.
- Shimamura, Reiko 1984. Back-formation of English compound verbs revisited. In: *The Tsuda Review* 29: 79–108.
- Shimamura, Reiko 1990. *Eigo no gokeisei to sono seisensei* [English word-formation and its productivity]. Liber Press, Tokyo.
- Sugioka, Yoko – Hideki Kobayashi 1999. Meishi + dooshi no fukugoogo [Noun + verb compounds]. In: Taro Kageyama (ed.): *Nichiei taishoo dooshi no imi to koobun* [Verb semantics and constructions in English and Japanese], 242–68. Taishukan, Tokyo.