This paper will make an empirical inquiry into morphological conversion in English, especially the V-forming type, and will argue that the categorial change involved in this process can best be analyzed using the notion of relisting (Lieber (1992, 2004, 2005)). Relisting is a type of listing process in the lexicon, and it will be shown that it can deal with the directionality of conversion, its word-basedness, its various lexical properties, the variety of its input and output categories, the strong restriction against conversion from suffixed words, and the non-uniformity of the conversion output. We will also suggest that the relisting approach is appropriate not only for categorial but also for semantic aspects of conversion.*

Keywords: categorial change, conversion, directionality, lexicon, relisting

1. Introduction

Since Clark and Clark’s (1979) extensive study, a vast amount of scholarship has been devoted to the semantics of conversion (CV hereafter) (e.g. Aronoff (1980), Lieber (1981, 1992, 2004), Kageyama (1997), Kiparsky (1997), Farrell (1998), Plag (1999), Hale and Keyser (2002) among others). The study of CV, however, has been so focused on its semantic aspects that the more fundamental question of how the category change occurs without any formal change has been largely neglected in the literature. This paper aims to tackle this question, and claims that CV categorial change results from relisting in the lexicon (Lieber (1992, 2004, 2005)). First, sec-

* This paper is based on one chapter of my doctoral dissertation submitted to Tsuda College. For its development, I am deeply indebted to Professor Reiko Shimamura, my supervisor, and Professor Shuji Chiba, Professor Masayuki Ike-uchi, and Professor Hisako Ikawa. I would also like to thank two anonymous reviewers and the members of the Lexicon Study Circle for their invaluable comments and suggestions. Thanks also go to Kirsten Fisher and Hilarie Stern for stylistic improvements. All remaining errors are of course my own. This work is in part supported by Grant-in-Aid for Young Scientists (B), No. 19720115, from the Ministry of Education, Culture, Sports, Science and Technology.
tion 2 will survey five theoretical approaches to CV in terms of how they deal with its categorial change. Then, sections 3, 4, and 5 will examine CV in terms of its directionality, word-basedness (Haspelmath (2002: Sec. 3.2, Ch. 9), Plag (2003: Sec. 7.3)),¹ and lexicon-relatedness. The results speak for the relisting approach, which will be further supported by three different properties of CV in section 6.

2. Five Approaches to Categorial Function

In terms of their treatment of categorial change, previous analyses of CV can be divided into the following five types: categorial change by means of a zero-affix, a morphological correspondence rule, a WFR (Word Formation Rule), a process called relisting, or a fifth theory, which claims that there is no category change in CV, only category determination.

2.1. Zero-Derivation Approach

Embedded in morpheme-based morphology (Haspelmath (2002: 45–47), Plag (2003: 180–184)), the zero-derivation approach reduces CV to the concatenation of a base morpheme and a zero morpheme (i.e. zero-affix). Since this approach is based on the (assumed) parallelism between CV and overt affixation, it claims that just as an overt affix determines the output category of affixation, a zero-affix determines the output category of CV. In other words, the category change in CV is caused by a zero affix.

Marchand (1969: 359), for example, assumes the following parallelism between CV and -ize suffixation:

\[(\text{paraffin})_N : (\text{paraffin+} \varphi)_V = (\text{alcohol})_N : (\text{alcohol}+\text{ize})_V\]

¹ In this paper, the term “word-basedness/word-based morphology” is used in the sense of Haspelmath (2002: Sec. 3.2, Ch. 9) and Plag (2003: Sec. 7.3), being opposed to the term “morpheme-basedness/morpheme-based morphology,” rather than in the sense of Aronoff (1976). Arguing against Halle’s (1973) theory where a word-formation rule can be applied to a stem, Aronoff (1976: 21) claims that the base of a word-formation rule is a (single already existing) word. His “word-based morphology” is thus opposed to “stem-based morphology,” and the distinction concerns the possible range of bases of word-formation rules. Our distinction between word-based and morpheme-based morphology, however, concerns the contrastive views on the segmentation of words into smaller units called morphemes. While morpheme-based morphology analyzes a word as a concatenation of morphemes, word-based morphology refuses the segmentation and analyzes a word as a member of a large set of formally and semantically related words. In other words, while the former focuses on the syntagmatic axis of language, the latter emphasizes its paradigmatic axis.
This proportion means that just as -ize attaches to a noun and derives a verb with the locatum meaning, so the zero affix attaches to a noun and derives a locatum verb. Whether overt or not, an affix selects the input category and determines the output category. This is possible because affixes, including zero, have a lexical entry where their selectional properties are specified along with their semantic, morphological, and phonological properties. In this analysis, CV is viewed as a process that concatenates morphemes in the same way as overt affixation.

Another implication is that CV is treated as a directional process. When two words in different categories have the same form and related meanings, one way to account for their relatedness is to derive one from the other. As we will see shortly, however, this is not the only possibility; some researchers attempt to account for the relatedness of the two formally-identical words without resorting to the base-derivative relationship. Treating CV as a directional or derivational process is not a trivial assumption; it requires empirical justification.

2.2. Correspondence Rule Approach

This approach challenges the traditional assumption that CV is a directional process. Embedded in word-based morphology (Haspelmath (2002: 47-51), Plag (2003: 184-188)), some researchers (e.g. Jackendoff (1975), Haspelmath (ibid.)) analyze the formal and semantic relatedness between two words not as a (directional) base-derivative relationship but as one (non-directional) pattern in the lexicon. Take as an example the relatedness between the following two sets of words:

(2) a. able, clear, common, kind, pleasant
    b. unable, unclear, uncommon, unkind, unpleasant

Refusing the segmentation of words into morphemes, theories using a correspondence rule argue that the words in (2a, b) exist in the lexicon with equal status, and the following pattern emerges from their existence in the lexicon:

(3) \[
    \frac{X}{A \leftrightarrow \text{not } X}
\]

The arrow is read as “is lexically related to” (Jackendoff (1975: 642)), so a correspondence rule says nothing about the “precedence” of one type of word over the other. In (3), neither the \(X_A\) type of word nor the \(\text{un}X_A\) type of word is the base of the other. All that a correspondence rule says is that there exists a relationship between two types of words.
Since this holds true of non-concatenative as well as concatenative processes, CV is also described as one particular pattern in the lexicon by means of a correspondence rule. The process of denominal V-forming CV, for example, is described as follows:

\[
\begin{pmatrix}
\text{N} \\
\text{`x'}
\end{pmatrix}
\leftrightarrow
\begin{pmatrix}
\text{V} \\
\text{`event having to do with `x'}
\end{pmatrix}
\]

(Plag (2003: 186))

In this case, too, neither of the related sets of words has precedence over the other. They have equal status, with no implication of directionality between them.

2.3. WFR Approach

The third approach is the WFR (Word-Formation Rule) approach advocated by Aronoff (1980). Stated simply, CV is described by a WFR, and thus it is regarded as a directional process from a base to a derivative. In other words, CV's category change is caused by a WFR. For example, the following WFR underlies the N-to-V CV:

\[
X_N \rightarrow X_V
\]

(Aronoff (1980: 747))

In this approach, too, CV is treated as a non-concatenative process and receives a word-based analysis.

2.4. Relisting Approach


Relisting is a very simple process. We are able to add a new item to the lexicon, so there should also be the possibility of picking out an item from the lexicon and re-entering it into the lexicon as a new item with a different category membership. This “relisting” of a lexical item, Lieber claims, is what is generally called CV. If the lexical item cat is re-entered as a verb, this means that the noun cat undergoes CV into a verb. Relisting the lexical item run as a noun is an instance of what is generally called V-to-N CV. Lieber (1992: 159) defines relisting as follows:

\[
\begin{align*}
\text{a.} & \quad \text{The lexicon allows for the addition of new entries.} \\
\text{b.} & \quad \text{CV occurs when an item already listed in the lexicon is re-entered as an item of a different category.}
\end{align*}
\]

The relisting approach has at least three implications. First, it means that CV is a directional process. Although Lieber (2005: 421) implies the con-
An analysis in which a lexical item is re-entered into the lexicon and yields a new lexical item presupposes the directionality or base-derivative relationship between the two (cf. Don (2005: 1)). Cat\textsubscript{V} and run\textsubscript{N} cannot exist without the prior existence of cat\textsubscript{N} and run\textsubscript{V} in the lexicon, and their lexical entries are constructed on the basis of the information about cat\textsubscript{N} and run\textsubscript{V}. In fact, Lieber (1992: 164–165) herself argues that the LCS (Lexical Conceptual Structure) of breakfast\textsubscript{N} forms the basis for the LCS of break\textsubscript{fastV}, and this accounts for native speakers’ intuition “that the noun is basic and that the verb is derived.” Furthermore, Lieber (ibid.: 163) claims that native English speakers perceive recently relisted verbs (e.g. gift\textsubscript{V}, impact\textsubscript{V}) as new or odd, and words formed by relisting cease to attract attention only when “they are firmly entrenched in the lexicon.” These statements strongly imply Lieber’s recognition that the input and output of relisting have different status in the lexicon.\textsuperscript{2}

Second, CV receives a word-based analysis as a non-concatenative process in this approach. Since it is entertained in the morpheme-based framework, Lieber’s theory uses the zero-derivation analysis whenever empirically justified. For instance, Lieber (1992: 160) analyzes the CV involved in the French compounding exemplified by essuie glace (essuie\textsubscript{V} glace\textsubscript{N} VP) “windshield wiper,” as a zero-affixation, i.e. a concatenative, morpheme-based process, because it displays the uniformity of gender and interpretation common to overt affixation. As we will see in section 4, however, empirical facts about English CV deny this type of analysis, so Lieber resorts to a word-based analysis called relisting.

The third implication is that CV is not a rule-governed process. Just like the “ordinary” listing process, the relisting of a lexical item takes place piecemeal. As a result, output items should show a certain degree of randomness or non-uniformity in their lexical entry information.

\textsuperscript{2} An anonymous reviewer claims that there should be no logical dependence relation between a relisting (i.e. CV) pair of words if any lexical item can undergo relisting. However, the paired words clearly differ in status in that one member cannot occur without the other and this relation cannot be reversed. Compare this with the bona fide non-directional views of the correspondence rule approach, where the paired words are listed along with many other words, simplex or complex, “from the beginning,” and of the category underspecification approach, where a category-neutral word alternates between two categories depending on its syntactic surroundings.
2.5. Category Underspecification Approach

This approach is advocated by researchers of various theoretical backgrounds, including Chomsky (1970), Myers (1984), Bald (1997), Marantz (1997), Croft (2001), Farrell (2001), and Borer (2003).³ They share the essential claim that the category of a word may be underspecified and that full specification is achieved only when it appears in a particular morphosyntactic context. If a category-neutral word (e.g., hammer) appears in a syntactic position reserved for a verb (e.g., I hammered a nail), it takes on verb properties. If the same category-neutral word is put into a nominal slot in a sentence (e.g., I used a hammer), it acquires nominal properties. In this view, the category distinction is not an inherent property of a word but something acquired from its morphosyntactic surroundings.

Given this claim, CV is not a derivational process proceeding from one category into another. Rather, it merely refers to the use of a category-neutral word in two (or more) different morphosyntactic positions. Thus, both N-to-V CV and V-to-N CV equally refer to the situation where one category-neutral word is used sometimes in a verbal position and sometimes in a nominal position.

Moreover, as Plag (2003: 114–116) appropriately points out, this approach treats CV not as a morphological process but as a purely syntactic phenomenon. This is so because the category determination of a word takes place only at the syntactic level. The analysis in which the category of a word is not determined until it enters a particular morphosyntactic context stipulates that the phenomenon called CV belongs to syntax. Furthermore, this statement is confirmed by Farrell’s (2001: 112–114) and Borer’s (2003: 31–40) claims that the meaning of a word is also determined at the syntactic level.

In sum, this section has surveyed five different approaches to CV’s category change. The discussion of each approach has made it clear that three issues in particular require empirical examination: CV’s directionality, word-basedness, and lexicon-relatedness.

³ While Myers and Bald are theory-neutral, Marantz is based in Distributed Morphology, Croft and Farrell in Cognitive Grammar, and Borer in the “Neoconstructionist” model (Levin and Rappaport (2005: 191–192)).
3. Directionality of CV

This section aims to prove that CV is a directional process.\(^4\) Independent of CV itself, Iacobini (2000: 870–871) sets up the following set of criteria for judging the direction of a derivational process:

(7) a. formal criterion
b. semantic criteria (i. semantic dependence, ii. semantic range)
c. quantitative-distributional criterion
d. possibility of further derivation
e. restrictions on word-forms
f. relative frequency

Iacobini claims that by applying these criteria, any pair of related words can be assigned a derivational direction. Therefore, any derivational process, including not only affixation but also non-concatenative processes like CV, back-formation, and reduplication, has directionality.

3.1. Semantic Criteria

3.1.1. Semantic Dependence

In the case of a CV pair, we cannot use the formal criterion that states that a derivative is the one marked as such by formal means. We will begin with the semantic criteria.

The semantic dependence criterion for derivational direction is based on the general view that a derivative semantically includes its base. Strictly adhering to this view, Marchand (1974: 220) claims that “content must be the final criterion of derivational relationship for any pair of words.” In fact, for most CV pairs, this criterion alone tells us the directionality unambiguously. For instance, the innumerable examples of denominal CV

\(^4\) Don (2004: 937–945) also puts forth arguments for the directionality of CV. He claims that the directionality of English CV between N and V manifests itself in (a) the stress difference between torment type of verbs and pattern type of verbs (e.g. torment\(_v\) vs. pattern\(_v\)) and (b) the inflectional difference between formally similar verbs (e.g. ring “to telephone”-rang-rung vs. ring “to put a ring”-ringed-ringed). The directionality of Dutch CV between N and V is also confirmed by morphological and phonological facts, or more specifically, by (a) the fact that Dutch does not have formally similar N-V pairs where both members exhibit “marked” morphological features (i.e. formally similar pairs of a neuter noun and an irregular verb) and (b) the fact that verbs that do not observe the strict phonological restrictions imposed on Dutch verbs in general, whose most important trait is monosyllabism, always have nominal counterparts, while phonologically unexceptional verbs do not.
verbs in Clark and Clark (1979) all fulfill this criterion. That is, none of their 10 semantic groups can be semantically analyzed without reference to the meaning of their nominal counterpart (e.g. saddlev: PROVIDE WITH saddle, kennely: PUT INTO kennel).

The semantic dependence criterion, however, is less useful when each member of the pair has an abstract meaning and the semantic dependence relation cannot be discerned clearly. In the case of CV, this shortcoming of the criterion manifests itself when the formally identical noun and verb express the same activity. Consider the following examples of N/V CV pairs from the OED:

(8) a. controlN/V, replyN/V
    b. implementN/V, refluxN/V, sidestepN/V
    c. claimN/V, conditionN/V, permitN/V, respectN/V
    d. thankN/V

The semantic dependence criterion does not work well with these pairs since the semantic analysis can go either way. Thus, if we analyze the meaning of respectv as “HAVE RESPECT,” it judges respectN to be the base and the verb the derivative. However, if we analyze the meaning of respectN as “ACT OF RESPECTING,” which is an equally possible option, it gives the opposite judgment. Some researchers (e.g. Lieber (1981: 183–184)) take this limitation too seriously and draw the hasty conclusion that CV has no directionality. The following two facts, however, clearly show that such a conclusion goes too far.

First, even if some CV pairs like (8) cannot receive an unambiguous judgment from the semantic dependence criterion, this ambiguity can always be resolved by resorting to the other criteria in (7). Shortly, we will demonstrate this in terms of the problematic pairs in (8). Second, the fact that the directionality of certain CV pairs is difficult to determine does not mean that CV itself is devoid of directionality.

3.1.2. Semantic Range

The generalization can be made that the semantic range of a (non-lexicalized) derivative is narrower and more specific than that of its base, primarily because a word usually undergoes a derivational process with one of its several meanings. For example, although the verb employ has at least three meanings, “hire,” “require,” and “make use of,” its derivative employee has a meaning related only to the first of these three (i.e. “the person who is hired”). In addition, this meaning of employee is more specific than the verbal counterpart in that only the former implies habitualness. Hence, the
semantic range of *employee* is narrower and more specific than that of *employ*.

We can use this generalization as the criterion for judging the derivational direction. In a CV pair, the member with the narrower and/or more specific semantic range is judged to be the derivative. Consider the following semantic descriptions of the CV pairs in (8a):

(9) control$_N$
\begin{align*}
a. & \text{the power to make decisions} \\
b. & \text{the activity of restricting} \\
c. & \text{the switches and buttons of a machine} \\
d. & \text{the standard of comparison in a scientific research} \\
e. & \text{the place where orders are given} \\
f. & \text{a particular key on a computer keyboard}
\end{align*}
control$_V$
\begin{align*}
a'. & \text{to have power over} \\
b'. & \text{to restrict}
\end{align*}

The semantic descriptions in (9) show that the semantic range of control$_N$ is broader than that of control$_V$. The semantic dependence criterion cannot decide which of the two is the base because the meanings of the verb in (9a', b') can be expressed in the nominal form, as in (9a, b). However, once we look at the semantic ranges of the two forms, we notice that control$_N$ is not restricted to activity meanings. It has other entity-oriented meanings in (9c–f), which are not shared by control$_V$. Given this fact, we can judge that CV proceeds from N to V in this case. The same argument applies to the CV pair reply$_N$/V, where the existence of the unpaired meaning in (10d') reveals that CV proceeds in the opposite direction.

### 3.2. Quantitative-Distributional Criterion

What Iacobini (2000: 870) calls the quantitative-distributional criterion is also highlighted by Aronoff (1976: 116–121). This criterion states that if a class of words $B$ is derived from a class of words $A$, then for every word $b$ in $B$ there must exist a corresponding word $a$ in $A$, but not vice versa. This statement can be schematized as follows:

(11) class of words $A$ \hspace{1cm} class of words $B$
\begin{align*}
a_1 & \quad b_1 \\
a_2 & \quad b_2 \\
a_3 & \quad b_3
\end{align*}
This shows that while all members of B (b₁, b₂, b₃) have a correspondent in A (a₁, a₂, a₃), the reverse is not true. Some members of A (a₄, a₅) do not have a correspondent in B. Given such a distribution, the criterion says, we should judge the words in A to be the bases and the words in B the derivatives. This is because a derivative always has a base, but not every potential base actually has a derivative. For instance, while all the -(i)an suffixed nouns have a nominal base denoting a person (e.g. Chomskyan) or a place (e.g. Bostonian), not every noun denoting a person or place has an -(i)an suffixed form (e.g. *Stalinian, *Milanian).

According to Aronoff (1976: 116–117), there exist only two examples of the Xment verb without a nominal counterpart: fomentᵥ and dementᵥ. The Xment noun without a verbal counterpart abounds, on the other hand; Aronoff finds approximately 500 examples of such nouns (e.g. armamentₙ, nutrimentₙ). Even when we exclude the Xment nouns in which X is a verb (e.g. employmentₙ, dismembermentₙ),⁵ 75 nouns of the form Xment still remain that do not have a verbal counterpart. Given this distribution, we should posit the N-to-V direction for the CV pairs in Xment form, including implementₙ/V in (8b).

This criterion is useful for detecting the CV direction regardless of the sizes of the word classes involved. Faced with the pair refluxₙ/V in (8b), for instance, one can examine the following distribution of a small number of words (taken from the OED) and judge refluxₙ to be the base:

(12) [Xflux]ₙ
    afflux          afflux
    conflux         conflux
    efflux          efflux
    influx          influx
    outflux         outflux
    reflux          reflux
    superflux

In the case of sidestepₙ/V in (8b), on the other hand, the criterion considers the distribution of a very large number of words; in fact, it refers to the distribution of two morphological types, compound noun and

⁵ The exclusion of deverbal Xment nouns (X = V) is necessary in order to obviate the blocking effect, the absence of Xmentᵥ due to the existence of Xᵥ.
verb. In English, compound nouns are formed quite productively, whereas there is no concatenative compound-verb formation process (Plag (2003: 142–155)). English has very few, if any, compound verbs formed by concatenating a head verb and a non-head word (possible candidates: stir-fry, drip-dry). Given this systematic distribution, the only possible analysis is to derive sidestep$_V$ from sidestep$_N$ by CV.

3.3. Possibility of Further Derivation

This criterion makes use of the fact that the derivational possibility of derivatives in general is much more restricted than that of bases. In other words, the output of a derivational process, whether obtained through affixation, CV, or some other process, resists undergoing further derivation. In the case of affixed words, this general property of a derivative manifests itself in the fact that the combination of affixes, the stacking of suffixes in particular, is strictly restricted (see Kiparsky (1982a), Fabb (1988), Plag (1996, 1999), Aronoff and Fuhrhop (2002), and Hay (2002) among others).

The derivational possibility of a CV verb is also strictly restricted. In fact, it cannot accept any derivational suffix except the three highly productive suffixes -er, -ing, and -able (cf. Myers (1984: 61–66), Pesetsky (1995: 76–78)). This generalization serves as the criterion; in a given CV pair, the member that has no suffixed form (except -er/-ing/-able forms) is the derivative. For instance, consider the following data (cited from the OED unless otherwise specified), which show the derivational possibilities of claim$N/V$ and respect$N/V$ in (8c):

\[
\begin{align*}
(13) & \quad a. \text{claim}_N: \\
& \text{claim}_V: \text{claimant}_N, \text{clamant}_A, (\text{claimer}_N, \text{claiming}_N, \text{claimable}_A) \\
& b. \text{respect}_N: \text{respectify}_V (\text{Matsuda (1999)}), \text{respectful}_A \\
& \text{respect}_V: (\text{respecter}_N, \text{respecting}_N, \text{respectable}_A)
\end{align*}
\]

In applying the criterion, we can ignore -er/-ing/-able forms because they are exceptions to the generalization. This exception having been considered, the above data clearly point to one specific derivational direction for each CV pair.

The directionality of condition$N/V$ and permit$N/V$ in (8c) becomes clear in terms of Allen’s (1978: 273–276) discussion of adjective formation. Allen observes that the two A-forming suffixes -al and -ive differ in their selectional properties, the former attaching to a noun (e.g. accident$N > $accidental$_A$) and the latter attaching to a verb (e.g. attract$_V > $attractive$_A$). Despite this fact, -al and -ive can never attach to members of the same CV pair. That is, when -al attaches to the N member, -ive cannot attach to the
V member, and when the V member accepts -ive, the N member refuses -al.

Although Allen accounts for this distribution of -all-ive adjectives by the Level Ordering Hypothesis, the generalization discussed above suffices. Each CV pair can take only one of the two A-forming suffixes because its converted member permits no further derivation. The generalization gives us an unambiguous judgment of the direction of a CV pair; the member that accepts -al or -ive is the base. In (8c), condition$_{N/V}$ (conditional, *conditionive) is N-based, while permit$_{N/V}$ (permissive, *permissal) is V-based.

3.4. Restrictions on Word-Form

This criterion states that the member whose possible word-forms are limited in some way is the derivative. To begin with Iacobini’s (2000: 871) simple illustration, consider thank$_{N/V}$ in (8d). The semantics does not tell us its direction, but the inflectional property does. We should consider that thank$_N$ is derived from thank$_V$, for the noun is only used in the plural form.

A systematic restriction on the possible word-form is found in V-forming CV; a CV verb always inflects regularly, as the following data show:

\[ (14) \]
\[ a. \text{He braked}/*\text{broke the car suddenly.} \]
\[ b. \text{He ringed}/*\text{rang the city with artillery.} \]

(Pinker and Prince (1988: 111))

\[ (15) \]
\[ a. \text{to fly} > \text{a fly} > \text{to fly “to hit a fly (ball)”} \]
\[ \text{e.g., He flied}/*\text{flew out to the center field.} \]
\[ b. \text{to cost} > \text{a cost} > \text{to cost “to fix or estimate the cost”} \]
\[ \text{e.g., Vera costed}/*\text{cost the equipment requests.} \]

(Kim et al. (1994: 179))

As we can see, a CV verb always takes a regular past tense form, even when it is homophonous with an irregular verb, as in (14), or when it has an irregular verb as its root, as in (15). This systematic restriction on the word-form leads to the following statement: if the verbal member of a CV pair inflects irregularly, then it is the base.

3.5. Relative Frequency

Iacobini’s (2000: 871) last criterion is frequency of occurrence. In general, there is a strong tendency for derivatives to be used less frequently than their bases. Plag (2002: 299–300), for instance, demonstrates that in a random sample of 92 -able suffixed adjectives taken from BNC, only seven are more frequent than their bases. Following Plag, we claim that the main reason for this fact lies in semantics. Since derivatives tend to have a nar-
rower and more specific range of meanings (as discussed in section 3.1.2), they cannot be used in as many contexts as their bases, which, in turn, leads to different frequencies.

This general frequency difference can also be used as a criterion for derivational direction. The less frequent member of a given word pair is the derivative. For instance, the pairs in (16a) below are judged to be the result of N-to-V CV, whereas those in (16b) below are judged to have V-to-N directionality. The frequency data are taken from Leech et al. (2001: 25–119) and represent a normalized frequency score of occurrences per million words.

(16)  
\begin{align*}  
\text{a.} \quad \text{comment}_{N/V} & \quad 75 \quad 47 \\
\text{control}_{N/V} & \quad 270 \quad 116 \\
\text{rain}_{N/V} & \quad 64 \quad 14 \\
\text{respect}_{N/V} & \quad 64 \quad 19 \\
\text{step}_{N/V} & \quad 139 \quad 57 \\
\text{b.} \quad \text{claim}_{N/V} & \quad 118 \quad 189 \\
\text{drink}_{N/V} & \quad 70 \quad 75 \\
\text{reply}_{N/V} & \quad 36 \quad 75 \\
\text{strike}_{N/V} & \quad 50 \quad 74 \\
\text{thank}_{N/V} & \quad 62 \quad 131 
\end{align*}

Notice that these frequency data confirm the directionality given to the pairs in (8) by the other criteria.

4. Word-Basedness of CV

4.1. Requirement for the Morpheme-Based Analysis of CV

This section aims to confirm that English CV should be given a word-based analysis rather than a morpheme-based analysis. As pointed out by many linguists (Bauer (1983: 32–33), Matthews (1991: 63–69), Haspelmath (2002: 31–34), Plag (2003: 22–27)), CV constitutes the Achilles heel for the morpheme-based framework because it lacks one-to-one correspondence between form and meaning. Its output has a meaning acquired through the CV process but no formal element corresponding to that meaning. The postulation of a zero morpheme as the bearer of the meaning, or the zero-derivation approach to CV introduced in section 2.1, is the classical way to save the morpheme-based view of morphology.

Given the fact that the unmarked morphological operations in English, affixation and compounding, are both concatenative ones, the zero-derivation
approach to CV might appear to be a reasonable way to treat English morphology as uniformly morpheme-based. As Lieber (1992: 160) appropriately points out, however, the morpheme-based analysis of a non-concatenative process should be justified only when it exhibits parallel properties to its concatenative counterpart. CV can be analyzed as a morpheme-based process only when it is proven to have parallel properties to those of overt affixation. English CV cannot be reduced to a morpheme-based process because it does not satisfy this requirement.

4.2. V-forming Derivational Domain: CV vs. Affixation

The distinct nature of English CV and affixation manifests itself most clearly in the V-forming domain. Since the preceding studies (Plag (1999: Ch. 5-8), Lieber (2004: Ch. 3)) have already shown this in detail, this section restricts itself to citing their most important differences. To start with the input properties, V-forming affixes (-ate, -ify, -ize, be-, en-, de-, dis-, un-) attach to the categories N or A only (e.g. activate, Nazify, zeroize, bedim, enlarge, defat, discreet, unhat) and impose strict phonological and morphological restrictions on the base (e.g., phonologically -ate and -ize need a trochaic base, while -ify demands a monosyllabic or iambic base, and morphologically they all require a Latinate base). CV, on the other hand, can take as its base an item of any category except V and of any phonological and morphological make-up (e.g. wall papery, negativey, forwardy, ahv, flip-flopv, soap-and-waterv, disv, DJv).

As for the output properties, affixed verbs are, to use the semantic groups of Clark and Clark (1979), semantically restricted to the locatum, location, and goal-meanings (e.g. moisturize, enlist, mummify, unbox), and their ASs (Argument Structures) are uniform (e.g., -ify/-ize verbs always have the AS x <y>). CV verbs, on the other hand, can express not only those three meanings but also the manner, instrument, duration, source, meal, crop, weather, and action-meanings (e.g. vetv, faxv, honeymoonv, piecev, break-fastv, clamv, hailv, darty) and many other miscellaneous meanings. In accordance with this semantic diversity, CV verbs exhibit various ASs, as the following CV verb-AS combinations show: access (x <y>), audition (x; x <y, for z>), cool (x; x <y>), e-mail (x <y, z>), gift (x <y, with z>; x <y,

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6 Sanders (1988) formalizes this requirement as the Overt Analogue Criterion.
7 Plag (1999: Sec. 6.1) claims that -ize verbs express the manner meaning too, but the instances are very few and all lexicalized (e.g. cannibalize, vampirize).
It is by now clear that while the V-forming affixation has a delimited and uniform nature, CV is of a heterogeneous and non-uniform nature. The morpheme-based analysis of CV, or the zero-derivation analysis, has no empirical justification in English because CV and affixation do not have parallel properties. In fact, their properties are almost complementary in the sense that CV covers the parts of the V-forming domain that cannot be covered by affixation. The distribution of the English V-forming processes, affixation, CV, and back-formation, even suggests that a certain kind of paradigmatic pressure or a paradigmatic mechanism close to van Marle’s (1985: Ch. 7) Domain Hypothesis is at work in derivation as well (Bauer (1997), Plag (1999: Ch. 8)), and their responsibilities (or their slots in the “V-derivation paradigm”) basically do not overlap.

A similar observation can be made for the N-forming derivational domain. Although both affixation and CV can derive a noun, their input and output properties do not overlap. The affixal nominalization is restricted by the selectional restrictions of each affix, especially those concerning the category and [±Latinate] feature of the base, and affixed nouns can express either event-centered meanings (e.g. construction (of the building) “activity,” vagabondage “state,” pavement “result,” landing “place”) or person-centered meanings (e.g. applicant “agent,” baker “agent, instrument,” examinee “patient”). CV, on the other hand, tends to be used for verbs without an established affixed noun (e.g. biteN, lookN, strokeN) and for light verb construction (e.g. take a walk). Moreover, unlike affixed nouns, CV nouns can express both event-centered and person-centered meanings (e.g. knockN “activity,” slumberN “state,” crackN “result,” hideN “place,” cheatN “agent,” liftN “instrument,” discardN “patient”).

In conclusion, the discussion in this section forces us to abandon the reduction of CV to a morpheme-based process. We must treat CV as a non-concatenative process because in each derivational domain it has clearly different functions from affixation; broadly speaking, CV functions as a versatile process that compensates for the limitations of affixation.

5. The Lexical Properties of CV

This section aims to show that English CV has properties typically related to the lexicon which are never expected of a syntactic mechanism.
5.1. Productivity

First and foremost, CV is not completely productive, like any other morphological process (Bauer (1983, 1988, 1992, 2001), Matthews (1991: 69–80), Plag (1999)). Whatever the reason may be, it leaves certain lexical gaps unfilled, and it is clear that not every potential base can actually undergo CV.

For instance, as section 6.3 will discuss in detail, certain types of derivatives (e.g. arrivalN, kindnessN, singerN) show a strong resistance to CV. Even simple nouns do not always have a CV verbal form. Why can’t we say *to Monday at the office or *to autumn in New York when we can say to Sunday at the cabin and to summer in Paris? These gaps may be attributed to pragmatics, but some simple nouns (e.g. peace) refuse CV for no imaginable reason (Lieber (1992: 217, fn. 11)). Similarly, why is it the case that CV verbs such as surgeonv and claw hammerv cannot become institutionalized (Bauer (1983: 48–50)), whereas doctorv and hammerv have been established as V? If CV were a syntactic process, all potential inputs should be equally able to undergo this process, and the outputs should be free from notions such as institutionalization and establishment.

It is also important that CV exhibits different degrees of productivity among its subtypes, especially its categorial and semantic subtypes. As section 6.2 will show, many combinations of input and output categories are possible in CV, but the productivity among them is not uniform; according to Nakao (2003: 112), the A-to-N CV is the most productive in PE (Present-day English), followed by the N-to-V, V-to-N, and N-to-A CVs in this order. The A-to-V, V-to-A, and Adv-to-A CVs are unproductive in PE. Different semantic subtypes of CV words also show different degrees of productivity. Clark and Clark (1979) show that of all the semantic groups of denominal CV verbs, instrument and manner verbs (e.g. dynamitev, chapronv) are particularly productive, more so than locatum, location, goal, and source-meanings and much more so than duration, meal, crop, and weather-verbs. To put it more generally, adjunct-incorporating CV is more productive than CV incorporating the prepositional complement, which is, in turn,

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8 The studies cited here demonstrate that word-formation processes differ from one another in terms of their degree of productivity.

9 Bauer (1988: 68–69) claims that a process is said to be fully productive (a) if it applies to every possible base defined solely in terms of the category, or (b) if it applies to every relevant base defined in terms of a number of specific restrictions. In either sense, V-forming CV in English cannot be said to be fully productive.
more productive than CV incorporating the internal argument (Kageyama (1997)). This fact speaks strongly against the claim that CV is a purely syntactic phenomenon, for the concept of productivity itself is alien to syntax, much less its varying degree.\(^ {10} \)

5.2. Blocking

Closely related to the issue of productivity is the fact that CV is under the influence of blocking (Aronoff (1976: 43)). That is, the productivity of V-forming CV is curtailed by the effect of blocking. Blocking is a (psycholinguistic) competition for a slot in the lexicon (Aronoff (1976: 43–45), Aronoff and Anshen (1998: 240)). If CV were a purely syntactic process and its output did not enter the lexicon, the blocking of CV verbs would be impossible. The blocking effect on CV can be detected in the distribution of denominal CV verbs and affixed verbs; the existence of an affixed verb prevents the formation of a CV verb from the same noun.

Lehnert (1971) and Muthmann (1999) list 829 denominal -ize suffixed verbs and 173 denominal -ify suffixed verbs. Out of the 829 -ize verbs, 111 instances have CV counterparts, whereas 31 out of the 173 -ify verbs do so. Comparing the meanings of the CV and suffixed forms yields the following three patterns: (a) the coincidence pattern (represented as “CV = -ize/-ify”), in which their semantic domains (the set of the meanings expressed) coincide, (b) the inclusion pattern (“CV ⊃ -ize/-ify”), where the semantic domain of a CV form includes that of a suffixed form as its subset, and (c) the exclusion pattern (“CV ≠ -ize/-ify”), where the semantic domains of a CV form and a suffixed form do not overlap at all. The following tables summarize the results of the comparison:

\(^ {10} \) Some researchers (e.g. Di Sciullo and Williams (1987: 4)), however, reject the view that the notion of productivity distinguishes morphology from syntax.
Table 1.

<table>
<thead>
<tr>
<th>-ize suffixation</th>
<th>number</th>
<th>percentage</th>
<th>examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>-ize verb without CV counterpart</td>
<td>718</td>
<td>86.61%</td>
<td>academize, barbarianize, cutinize, ebonize, graphitize</td>
</tr>
<tr>
<td>-ize verb with CV counterpart</td>
<td>111</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(a) CV = -ize</td>
<td>33</td>
<td>3.98%</td>
<td>alphabet(ize), ghetto(ize)</td>
</tr>
<tr>
<td>(b) CV ⊃ -ize</td>
<td>51</td>
<td>6.15%</td>
<td>dock/dockize, pellet/pelletize</td>
</tr>
<tr>
<td>(c) CV ≠ -ize</td>
<td>27</td>
<td>3.26%</td>
<td>cycle/cyclize, motor/motorize</td>
</tr>
</tbody>
</table>

Total number of -ize verbs: 829

Table 2.

<table>
<thead>
<tr>
<th>-ify suffixation</th>
<th>number</th>
<th>percentage</th>
<th>examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>-ify verb without CV counterpart</td>
<td>142</td>
<td>82.08%</td>
<td>alkalify, fortify, metrify, mercurify, ossify, townify</td>
</tr>
<tr>
<td>-ify verb with CV counterpart</td>
<td>31</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(a) CV = -ify</td>
<td>5</td>
<td>2.89%</td>
<td>jelly/jellify, zinc/zincify</td>
</tr>
<tr>
<td>(b) CV ⊃ -ify</td>
<td>11</td>
<td>6.36%</td>
<td>prose/prosify, pulp/pulpify</td>
</tr>
<tr>
<td>(c) CV ≠ -ify</td>
<td>15</td>
<td>8.67%</td>
<td>fish/fishify, gas/gasify</td>
</tr>
</tbody>
</table>

Total number of -ify verbs: 173

Among other things, these tables show that the majority of the suffixed verbs do not have a CV counterpart (86.6% of all the -ize verbs and 82.0% of all the -ify verbs). This gap in CV should be attributed to blocking by -ize/-ify verbs in light of the following two facts.

First, nothing semantically prevents the base nouns of the unpaired -ize/-ify verbs from undergoing CV. The semantic domain of V-forming CV includes that of overt affixation as its subset as discussed in section 4.2. Hence, all the meanings that the suffixed verbs express can be expressed by CV forms. Second, as shown in section 4.2, V-forming CV has few input restrictions. It accepts phonologically, morphologically, and semantically-diverse elements, with the exception of certain derivatives.

If this is so, what prevents the nouns in question from being converted? The only answer is blocking by -ize/-ify verbs. Unpaired -ize/-ify verbs lack their CV counterparts because their very existence blocks the occurrence of CV forms. Although synonymous pairs, or more specifi-
cally, pairs exhibiting the coincidence pattern and the inclusion pattern, do exist, the -ize/-ify verbs of these pairs account for a fairly tiny portion of all the -ize/-ify verbs (10.13% of all the -ize verbs and 9.25% of all the -ify verbs). Therefore, it is safe to conclude that affixed verbs block their CV counterparts. To use the terms of Rainer (1988: Sec. 2 and 3), affixation token-blocks CV, although type-blocking is not operative.

5.3. Lexicalization

The lexicon-relatedness of CV is also confirmed by the fact that certain properties of CV verbs are very difficult, or even impossible, to account for if they were not listed in the lexicon. The properties in question concern the (diachronic) process of lexicalization (see Bauer (1983: 45–50)).

The lexicalization of a complex word can be equated with the process of its losing transparency. As Clark and Clark (1979: 804–805) discuss using the term “idiomatization of a denominal verb,” a CV verb also undergoes the diachronic shift from the nonce/transparent stage to the lexicalized/opaque stage. This very fact speaks for the lexicon-relatedness of CV since it is impossible that a complex word gradually loses its transparency without being listed in the lexicon. The effects of this diachronic process on CV verbs can be found in (I) their semantic fixation, (II) their metaphorical use, (III) their doubling possibility, and (IV) their inflectional property.

(I) Semantic fixation

First of all, the semantics of a CV verb, which is very versatile and can express virtually any activity that has some connection with its base word (see section 4.2), gradually becomes fixed with one particular meaning. Although as a nonce formation, a CV verb can be assigned any meaning associated with the base, such versatility gradually decreases, eventually reaching the point where it resists being used in a meaning other than the fixed one. This semantic fixation is the result of a CV verb becoming institutionalized. Once a CV verb is established as an independent lexical item with a particular meaning, it becomes difficult, though not impossible, to assign any other meaning to the verb.

For instance, the usual interpretation of the CV verb bottle is the location meaning “put (liquid) into a bottle,” in spite of the fact that there are many other activities related to bottles. Bottle\textsubscript{CV} is semantically fixed in this way because putting liquid into a bottle is the most typical activity associated with a bottle, and the verb has been institutionalized with that meaning. As a result, if we want to use this verb for other meanings such as “hit with a bottle,” “throw a bottle at,” or “drink heavily,” we need certain contexts to
induce them.

(II) Metaphorical use

The second effect of lexicalization on CV verbs can be found in the fact that once institutionalized, a CV verb becomes more and more independent of its base. By gaining its own place in the lexicon, a CV verb becomes increasingly like an underived verb, with its own properties separate from those of the base. As a result, unlike affixed verbs, CV verbs permit metaphorical interpretation where the referent of the base is not involved, as follows:

(17) a. She fished a cigarette from the heap of things she’d emptied onto the sofa cushion. (Raymond Carver, “Careful”)

b. Most company chairmen proudly trumpet the number of jobs that they have cut during the recession. (BNC)

In these examples, the base referent plays no role and is used merely as a metaphor. Such semantic separability from the base means that a CV verb of this kind has lost some degree of semantic transparency. The metaphorical meaning cannot arise from the compositional semantic interpretation; rather, it results from semantic extension in the lexicon.

(III) Doubling possibility

Our claim that a CV verb gradually becomes independent of its base is further supported by what Kageyama (1997: 52) calls the doubling phenomenon. This refers to the phenomenon in which a complex predicate realizes its semantically incorporated element syntactically. In the following instances, the underlined phrases are syntactic realizations of the nouns incorporated into the CV verbs:

(18) a. He will wad the blueprints into tight balls and fling them into the lake. (Bobbie Ann Mason, “Shiloh”)

b. There is no room for a chair, so I crouch between the willows and hook a plummet onto the size 18 hook. (BNC)

The syntactic doubling is not specific to V-forming CV, as shown below.

(19) a. She kicked him with her *(booted) foot. (Kageyama (1997: 48))

b. I bit him with my *(false) teeth. (Konishi (1980: 138–139))

These examples suggest that the semantically incorporated element and its syntactic realization should maintain a hyponymy relation taken in a broad sense. Otherwise, they would be judged to be unacceptable due to semantic redundancy.

some CV verbs with the instrument meaning permit doubling even when it
does not satisfy the condition. He (1997: 488–489) cites the following ex-
amples:

(20)  a. *She taped the picture to the wall with pushpins.
b. *They chained the prisoner with a rope.
(21)  a. He hammered the desk with his shoe.
b. String him up with a rope!

The CV verbs in (20) require the doublings to satisfy the condition, but
those in (21) do not. This difference also comes from lexicalization. Re-
analysis as an underived verb in the lexicon makes it possible for a CV
verb to take on a doubling independent of its base. Kiparsky (ibid.) of-
fers essentially the same account, claiming that the verbs in (21), unlike the
"true denominal verbs" in (20), are "basic verbs which merely share their
root with a noun" (see also Don (2004: 949–953)11). Since lexicalization
proceeds gradually, different CV verbs are in different stages of this pro-
cess. Therefore, it is just as expected that some CV verbs observe the hy-
ponymy relation condition as in (20), but other CV verbs are exempt from
this condition, like those in (21).

(IV) Inflectional property

Interestingly, the doubling possibility of a CV verb shows a correlation
to its inflectional property. Most CV verbs take a regular past form (e.g.,
He spitted/*spat the pig, He flied/*flew out to center field) as discussed
in section 3.4, but a few examples are inflected irregularly (e.g., Mary
strung/*stringed up John). This difference among CV verbs is related to
their adherence to the condition of the doubling. A regularly-inflecting CV
verb observes the hyponymy relation condition, as in (22a) below, while an
irregularly-inflecting CV verb does not, as in (22b) below.

(22)  a. George ringed/*rung his pigeon with a gold ring.
b. Mary strung/*stringed up John with a rope.

(Kiparsky (1997: 40))

Such a correlation strongly supports our claim that CV verbs permit-
ting a non-hyponymous doubling have almost attained status as underived
verbs. The regular inflection of a CV verb results from its status as a de-

11 Don (2004: 949–953) claims that Kiparsky’s analysis of the verbs in (20) as “truly
denominal” and those in (21) as underived constitutes a strong piece of evidence against
the category underspecification approach. This approach posits a category-less lexicon,
so it cannot make a distinction between the verbs with a nominal base, like (20), and the
underived verbs, like (21).
5.4. Compositionality of Meaning

The last argument against the view of CV as a syntactic process concerns semantic compositionality. Typically, the meaning of the output of a syntactic process is determined compositionally. The semantics of a CV verb, however, can hardly be described as compositional. Diversified meanings of a CV verb (e.g. flatlinev “die,” macv “eat heavily”) cannot be derived by simply combining the meaning of a base and some pre-determined verbal meaning (such as an LCS-template). In that sense, affixed verbs enjoy a much higher degree of semantic compositionality. Their meanings (e.g. moisturize “provide with moisture”) can be determined by combining the meaning of a base (e.g. moisture) and the verbal meaning provided by an affix (e.g. the locatum meaning of -ize).

6. Arguments for the Relisting Approach

6.1. Evaluation of the Five Approaches

The preceding section has proved that CV is a directional and word-based process that belongs to the lexicon. The evaluation of the five approaches to CV in terms of its directionality, word-basedness, and lexicon-relatedness reveals the superiority of the relisting approach; this is the only option that can deal with all of these properties without additional stipulations. The correspondence rule approach conflicts with the directionality of CV, while the category underspecification approach conflicts with both the directionality and lexicon-relatedness of CV. Although the zero-derivation approach can deal with directionality, it has a fundamental problem in that it incorrectly analyzes English CV as a morpheme-based process.

It is also doubtful that the zero-derivation, correspondence rule, and WFR approaches can provide an adequate account for the various lexicon-related properties discussed in section 5, especially productivity. First, in order to deal with them, the zero-derivation and WFR approaches must make an independent assumption that the output CV words will be listed in the lexicon, which is unnecessary in the relisting approach. Second, the semi-productivity of CV, or the existence of the accidental gaps in CV we saw

12 Kim et al. (1991, 1994) claim that the regular inflection of a CV verb is due to the exocentricity of CV.
in section 5.1 (e.g. *to peace), is nothing but a result of the randomness of
the listing process in general in the relisting approach. In contrast, some
special mechanisms or restrictions are necessary to prevent peaceN, for in-
stance, from undergoing the zero-derivation, the correspondence rule in (4),
and the WFR in (5), for these three are defined as systematic rule-governed
processes (see also Lieber (1992: 164)).

The following sections will adduce three additional advantages of the re-
listing approach and confirm its superiority over the other approaches.

6.2. Uniform Analysis of Various Categorial Combinations of CV

The first advantage of the relisting approach concerns the diversity of the
input and output categories of CV. As mentioned in section 5.1, English
CV allows many combinations of input and output categories. Concretely,
English has at least 21 types of CV given below, although they differ from
one another in productivity. The examples are from the OED unless other-
wise indicated.

(23) a. CV to V from: N (hammerV), A (coolV), Adv (upV), Interjec-
tion (oh-ohV), Sound symbolism (ding-dongV), Phrase (hands-
upV), Affix (disV), Conjunction (ifV)
b. CV to N from: V (buyN), A (sweetN), Adv (forwardN), Inter-
jection (ohN), Sound symbolism (ZN), Conjunction (ifsN), Af-
fix (ismN)
c. CV to A from: N (choiceA), V (flickerA), Adv (seldomA), P
(withA (Matsuda (1999)))
d. CV to Adv from: V (bumpAdv (Biese (1941: 225))), A
(slowAdv)

Unlike the other approaches, the relisting approach can offer a uniform
analysis of these categorially diverse subtypes of CVs. As long as it is
listed in the lexicon, an item of any category has the capability to under-
gerelisting into any open-class category but the original one. Therefore, the
relisting process itself does not need to incorporate categorial selectional in-
formation into its mechanism.13

Such a uniform analysis is, however, impossible for the zero-derivation,

13 The category underspecification approach, too, does not need such information in
its mechanism, but the categorial diversity of CV forces it to make a dubious assumption
that not only nouns and verbs but also all the other categories can be category-neutral in
the lexicon.
correspondence rule, and WFR approaches. Like ordinary affixes, a zero affix should have selectional properties including categorial selection. If so, the categorial diversity of CV shown in (23) means that we must postulate numerous zero affixes, which are specified for each categorial combination (e.g. a zero affix that selects N as its input and V as its output, a zero affix that selects V as its input and A as its output, and so on). For the same reason, we must posit numerous correspondence rules and WFRs; as the rules in (4) and (5) show, both the correspondence rule and the WFR inherently have the categorial specification.

One might cite the productivity differences among the categorial subtypes of CVs mentioned in section 5.1 as an argument against the relisting approach. If the relisting process does not distinguish between different combinations of input and output categories, why are the CVs in (23a) more productive than the CVs in (23c, d) for instance? One key to this question lies in the “default”-like role that CV plays in each derivational domain suggested in section 4.2; the productivity of each subtype of CV is determined by its paradigmatic relation to the other derivational processes. Thus, the CV that belongs to the derivational domain that has productive affixation processes (e.g. -er/-ing/-ness suffixations in the N-forming domain, -ly suffixation in the Adv-forming domain) appears to have lower productivity than the CV that belongs to the domain with fewer affixal resources (like the V-forming domain).

6.3. Restriction against CV from Suffixed Words

Irrespective of category, transparent suffixed words are systematically excluded from the input to V-forming CV.\textsuperscript{14} Transparent suffixed words cannot be converted into verbs whether they have a verbal base, as in (24a) below, or a nominal or adjectival base, as in (24b). On the other hand, there are instances of CV verbs from semantically opaque suffixed words; those in (25a) below are from opaque suffixed nouns, and those in (25b) from opaque suffixed adjectives. CV verbs in (24) do not exist according to the OED, and those in (25) are taken from it unless otherwise specified.

\textsuperscript{14} A similar observation is made on A-to-N CV by Bergener (1928: 34), who reports that “[a]djectives formed by means of suffixes that are felt as exclusively adjectival, for instance ModE. -\emph{ish}, are seldom or never turned into pure nouns.”

(25) a. bandagev, packagev, allowancev, prominencev, tolerancev, trusteev, refereev, lighterv, registerv, scooterv, sleeperv, solderv, stretcherv, hostessv, waitressv, actionv, propositionv, provisionv, vacationv, compartmentv, complimentv, departmentv, supplementv, witnessv, inventoryv, closurev, indenturev
b. continentalv, horizontalv (Biese (1941)), rottenv (Biese (1941)), slowerv, westernv, picturesquerv, lavishv, negativev, positivev, lightlyv, lowlyv, dirtyv

The semantics is not at issue; there is nothing semantically wrong with the unacceptable CV verbs in (24). As far as semantics is concerned, *accusationv in (24a), for instance, should be acceptable with an action meaning (cf. dartv). Similarly, *kindnessv in (24b) is semantically unexceptionable and should be acceptable with a meaning like “treat (someone) with kindness,” for the semantically similar nouns love and humor can be converted into verbs. More puzzling is the fact that even when a suffixed word has a concrete meaning, it cannot undergo CV as long as it is transparent. For example, semantically, *abuserv and *promoteev in (24a) should be acceptable on par with umpirev “act like an umpire” and orphanv “turn (someone) into an orphan.” By the same token, *canneryv in (24b), based on a place-denoting -(e)ry noun, should be semantically well-formed, just like CV verbs from place-denoting simple nouns (e.g. churchv, schoolv).

The unacceptability of CV verbs in (24) also cannot be (entirely) attributed to blocking. The account based on blocking might appear to be plausible as long as we are looking at the data of deverbal suffixed verbs in (24a). We could say, along with Marchand (1969: 372) and Bauer (1983: 226), that *accusationv is blocked by its root or “ancestor” verb accuse. This account, however, collapses once we notice that even denominal and de-adjectival suffixed words cannot be converted if they are transparent, as (24b) shows.

Neither semantics nor blocking is at issue. The relisting approach, however, offers a straightforward account based on the listedness of complex words. Transparent suffixed words do not undergo CV (i.e. relisting) because they are not listed in the lexicon, while lexicalized (opaque) suffixed words, which do have lexical entries, can be relisted as verbs. Any word
to be relisted must be in the lexicon, and complex words enter the lexicon only if they are lexicalized.

In contrast to this simple account, the other approaches need some stipulations to handle the data. In the correspondence rule approach, where all complex words are listed in the lexicon, the question arises why only transparent suffixed words cannot enter into the pattern described by the correspondence rule of CV. In the WFR approach, it also remains unclear why transparent suffixed words in particular are excluded from the input to the WFR of CV. The zero-derivation approach must account for why a zero affix cannot attach to transparent suffixed words, a kind of affix-stacking problem. First, the level ordered morphology, where the V-forming zero affix is located at level 3 (Allen (1978: Sec. 4.4)) or level 2 (Kiparsky (1982b: 138–143)) on phonological grounds, cannot deal with the data in (24) because they involve not only level 2 suffixes (e.g. -ment) but also level 1 suffixes (e.g. -al). It cannot account for the data in (25) either unless it makes an uncommon assumption that lexicalized suffixed words are outside the level ordering. Second, Don (2005: 11–12) claims that the stacking of affixes (including zero) is regulated by Aronoff and Fuhrhop’s (2002: 473) Monosuffix Constraint. This constraint says that suffixes that select Germanic bases select unsuffixed bases, and Don’s argument is that the V-forming zero affix selects both Germanic and Romance bases so that it can attach to a suffixed word if it is Romance (e.g. allowance, package). However, this account also fails because the data in (24) and (25) both consist of Germanic and Romance words.

In sum, not affixal level or Germanic/Romance origin but listedness distinguishes the bases of the CV verbs in (24) from those in (25). Hence, only the relisting approach can offer a stipulation-free account for the data.

6.4. Non-Uniformity of the CV Output

Lastly, the relisting approach correctly predicts non-uniform properties of the output of CV. CV in this approach is not a rule-governed process, but is rather a random process making use of the ordinary listing process in the lexicon. As a result, its output should show a certain degree of non-uniformity or randomness.

First, as section 4.2 showed, the semantics of CV verbs are not uniform. Not only do different CV verbs express different meanings, but each CV verb potentially allows for highly flexible semantic interpretation. Such semantic diversity of CV is in striking contrast with the semantic uniformity of the affixation. Affixed verbs are restricted to a particular semantic do-
main (i.e. the locatum, location, and goal-meanings), and their meanings do not fluctuate depending on the context. Thus, while motorize expresses the locatum meaning only, motor\textsubscript{V} expresses not only the instrument but also other miscellaneous meanings such as “get into one’s stride.”\textsuperscript{15} In addition, section 4.2 also showed that unlike affixed verbs, CV verbs exhibit non-uniform ASs as a result of their semantic diversity; different CV verbs take different numbers of arguments and realize them in different ways. Such structural non-uniformity would not follow from a rule-governed process.

The randomness of CV also manifests itself in the phonology of the output. It is well known that CV sometimes results in a segmental or suprasegmental difference between its input and output.\textsuperscript{16} Below are representative examples.

\begin{enumerate}
\item[(26)]\begin{enumerate}
\item calf/calve, grief/grieve, bath/bathe, breath/breathe, loath/loathe, wreath/wreathe, house/house [hauz], device/devise
\item compress\textsubscript{V}/compress\textsubscript{N}, produce\textsubscript{V}/produce\textsubscript{N}, permit\textsubscript{V}/permit\textsubscript{N}, surve\textsubscript{Y\textsubscript{V}}/survey\textsubscript{N}, torment\textsubscript{V}/tortment\textsubscript{N}; attrib\textsubscript{U\textsubscript{V}}/attrib\textsubscript{U\textsubscript{V}}, égress\textsubscript{N}/égress\textsubscript{V}, escort\textsubscript{N}/escort\textsubscript{V}, progress\textsubscript{N}/progress\textsubscript{V}
\end{enumerate}
\end{enumerate}

These phonological changes involved in CV are not uniform in two senses. First, their application is unpredictable, and not every eligible CV word shows the phonological change (e.g. shelf\textsubscript{V}/*shelve\textsubscript{V}, accord\textsubscript{V}/accord\textsubscript{N}, comment\textsubscript{N}/comment\textsubscript{V}, see Myers (1984: Sec. 2)).\textsuperscript{17} Second, the stress shift in (26b) is optional in some pairs (e.g. escort\textsubscript{V}, surve\textsubscript{Y\textsubscript{N}}).

CV’s lack of rule governance also underlies Lieber’s (1992: 163) observation that speakers of English do not know the exact content of the lexical entry of a new CV word. Thus, she argues that without a context, the new CV verb knob\textsuperscript{18} can be assigned any of the meanings “to imitate a knob,” “to assault (something) with a knob,” and “to put a knob on (something)” (among others), and either of the ASs x (e.g., \textit{I knobbed all night}) and x

\textsuperscript{15}I am grateful to an anonymous EL reviewer for pointing out this example.
\textsuperscript{16}I am grateful to an anonymous EL reviewer who has drawn my attention to this fact. Citing the lack of productivity of the phonological changes in (26a), the reviewer suggests that the zero-derivation is a level 0 process, or a process at the initial stage of the lexicon. The suggestion itself is worth considering, but the non-productivity can be dealt with as a result of the randomness of the relisting.
\textsuperscript{17}Contra Marchand (1969: 377–379), Pennanen (1971: 36–39) claims that N/V pairs differentiated by stress are not always instances of V-to-N CV. He claims that some CV verbs exhibit stress shifting, including the last four pairs in (26b).
\textsuperscript{18}Although Lieber (1992: 163) claims that this is a new verb, the \textit{OED} tells us that it was first attested in as early as 1566.
The same observation is reported by Kelly's (1998: 377) experimental study. He asked 12 adult native English speakers to interpret the new CV verb balcony used in the sentence She balconied over to Romeo. Their interpretations showed great variability (e.g., “She bent over the balcony to Romeo,” “She climbed over the balcony to get to Romeo,” “She jumped from balcony to balcony,” “She made her way over to Romeo on the balcony,” “She met Romeo at the balcony,” “She spoke from the balcony to Romeo,” “She tiptoed over to Romeo”).

All of these properties of CV verbs, absent from affixed verbs, follow naturally from the relisting approach, where CV is not a rule-governed process. The zero-derivation, correspondence rule, and WFR approaches, however, treat CV as rule-governed, and thus cannot predict its non-uniformity.

In sum, section 6 has presented empirical arguments for the relisting approach. Not only can this approach deal with the directionality, word-basedness, and lexicon-relatedness of CV, but it can also deal with the categorial diversity of CV, its morphological restriction involving suffixed words, and the non-uniformity of its output.

7. Conclusion

The empirical examination of several significant properties of CV has led us to adopt the relisting approach, according to which CV is a type of listing in the lexicon. No other option can deal with the properties of CV as fully and naturally.

Hopefully the approach we have adopted for CV’s categorial function will be related in some meaningful way to its semantic function. The extensive discussion on this function in the literature gives us one significant key to this issue: the sparseness of the semantics of CV. The sparse-semantic approach to CV (e.g. Clark and Clark (1979), Aronoff (1980), Farrell (1998)) claims that the variety of meanings that can be expressed by CV verbs is so diverse that there should be no specific meanings attached to this process at all; CV has “sparse” semantics. Notice that this approach and the relisting approach match each other perfectly, since as a non-rule-governed process the (re)listing process does not specify the exact content, including the semantic information, of the lexical entry of a newly (re)listed word.

In fact, Lieber (1992: 164–165) suggests that when N is relisted as V, the semantic information of the new verbal entry, or its LCS, is constructed in such a way as to include the LCS of the base noun. This view is obvi-
ously tantamount to saying that a CV verb can express any activity that has something to do with the base. Hence, we may conclude that the sparse semantic approach is subsumed within the relisting approach as its semantic procedure.19, 20

As a final remark, it is important to note that our conclusion does not mean that every CV should be analyzed as relisting. An appropriate analysis of a particular CV in a particular language, i.e., whether it is a zero-derivation, relisting, or other type of process, entirely depends on the examination of its general properties. This paper has revealed English CV to be relisting and will provide a basis for the future investigation of various CVs along this line.

19 As appropriately pointed out by an anonymous EL reviewer, CV verbs cannot express certain types of meanings. The preceding studies suggest that the “agent-incorporating” CV verbs like (ia) and the transfer-of-possession CV verbs like (ib) are systematically excluded from the semantic domain of CV.

(i) a. *The ball boyed to the fence. (“The ball went to the fence by a boy.”)
   b. *She churched her money. (“She gave a church her money.”)

((a) from Farrell (1998: 49), (b) from Farrell (ibid.: 40))

The existence of these semantic gaps in CV, however, does not contradict the sparse semantics predicted from the relisting approach, for they are among the systematic gaps in morphology. For instance, Kageyama (1997: 82–87) advances the Salience Principle to capture the fact that complex predicate formation processes in general exclude external arguments (e.g. *child-swimming_n). He claims that an external argument is the most salient element in a sentence, so it must be obligatorily realized syntactically.

According to Fabb (1998: 74–76), the absence of transfer-of-possession CV verbs can also be attributed to a general constraint on word meanings. Fabb observes that English compounds generally lack the recipient interpretation. Thus, the N-N compound store-clothes cannot mean “clothes sold to a store,” while the synthetic compound heaven-sent can be interpreted only as “sent from heaven,” not as “sent to heaven.” He argues that in word meanings, fortuitous or temporary relationships are ruled out in favor of generic or habitual relationships, and this is why the recipient interpretation is ruled out in general.

20 Aronoff’s (1980) sparse semantic approach enables us to account for productivity differences among the semantic groups of CV verbs, too. Aronoff (1980: 749) argues that a CV verb is interpreted in the evaluation domain of its base word, the set of activities its base is conventionally associated with. Thus, a word with a stronger association with some activity is more likely to undergo CV into a verb. This is why CV from nouns denoting an instrument or profession (e.g. knife, marshal), CV from an activity noun (e.g. control, protest), and CV from a sound symbolic word (e.g. boom) are particularly productive. Kageyama’s (1997) Salience Principle mentioned in Note 19 offers another account for semantic productivity differences of CV (see also section 5.1).
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bridge, MA.


[received 1 April 2008, accepted 20 July 2008]

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