English [V-A]$_V$ forms and the interaction between morphology and syntax*

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1. Introduction

In English resultative constructions, adjectival resultative predicates may occur not only in the post-object position, but sometimes also in the pre-object position. Compare the two sentences (a) and (b) paired in (1)-(4) below. The sentences in (a) are canonical resultative constructions, but in the corresponding sentences in (b), the adjective immediately follows the verb.

(1) a. Mother bleached the shirt white.
b. Mother bleached white the shirt. (Taniwaki 2006:251)

(2) a. Mary wiped the floor clean.
b. Mary wiped clean the floor. (Taniwaki 2006: 267)

(3) a. John pushed the door open.
b. John pushed open the door. (Taniwaki 2006: 251)

(4) a. Cornelius slammed the boot shut.
b. Cornelius slammed shut the boot. (Taniwaki 2006: 270)

As we will show immediately, previous studies have revealed that the V-A sequences in (1b)-(4b) behave as lexical units. However, it remains unclear what kinds of lexical units they are, and how they are related to the corresponding canonical resultative constructions in (1a)-(4a). The aim of this paper is to answer these questions and examine the implications they have for the interaction between morphology and syntax in English. Henceforth, we will call the V-A sequences "V-A forms."

The paper is organized as follows. In section 2, we will review previous studies on V-A forms and summarize the main properties of V-A forms. Their behavior as lexical units has led researchers to conclude that they are formed by morphological compounding, but as we will criticize in section 3, the compounding analysis has at least three serious problems. In section 4, we will offer an alternative analysis according to which V-A forms constitute a heterogeneous category. On the basis of new findings, we will argue that the V-A forms are not formed by compounding but arise from interactions between morphology and syntax. To be more specific, our claim is that the V-A forms in (1b) and (2b) are lexicalizations from the corresponding resultative constructions in (1a) and (2a), while the V-A forms in (3b) and (4b) and the corresponding resultative constructions in (3a) and (4a) represent particle verb constructions.

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2. Previous Studies

As previous studies on V-A forms, we have Bolinger (1971), Kanemoto (2002), and Taniwaki (2006), among others. Although they differ in several respects, it seems safe to say that they agree that V-A forms have the following three basic properties:

(5) a. V-A forms are lexical units.

b. Semantically, V-A forms can be divided into the following two types:[1]

(i) The adjective is an overt realization of the resultant state that the verb inherently expresses.

e.g. (1b) *bleach white*, (2b) *wipe clean*

(ii) The verb expresses an activity of force exertion (e.g. *blow, fling, jerk, jiggle, pull, push, squeeze, throw, wave, wiggle*), and the adjective expresses the resultant state of disconnection (e.g. *clear, free, loose, open, shut*).

e.g. (3b) *push open*, (4b) *slam shut*

c. All the V-A forms have a corresponding resultative construction, but not vice versa.

To begin with the property stated in (5a), V-A forms are lexical units. Kanemoto (2002) and Taniwaki (2006) verify this by referring to standard criteria for the word-phrase distinction, including the Principle of Lexical Integrity (Bresnan and Mchombo 1995) and No Phrase Constraint (Botha 1984). Witness the data given in (6)-(8) below. The contrast in (6) shows that the gapping of the V-A form as a whole is possible, but deleting only the V is not allowed. According to the Principle of Lexical Integrity, this fact means that the V-A form as a whole constitutes a lexical unit. The lexical status of the V-A form is corroborated by the additional contrasts shown in (7) and (8); the adverbial modification of an adjective is possible in a resultative construction, but it is not in a V-A form. Also, it is possible to conjoin two V-A forms, but the conjunction of two adjectives inside a V-A form is not allowed. These observations are exactly what No Phrase Constraint predicts if the V-A form is a lexical unit.

(6) a. Eric pushed open the front door, and Tony [~~pushed open~~] the back door.

b. *Eric pushed open the front door, and Tony [~~pushed~~ shut] the back door.

(Taniwaki 2006: 254)

(7) a. He cut the conference very short.

b. *He cut very short the conference. (cf. He cut short the conference.)

(Kanemoto 2002: 83)

(8) a. John both flung open and flung shut the back door.

b. *John flung both open and shut the back door. (Taniwaki 2006: 256)

In addition to the lexical status of V-A forms, Taniwaki (2006: 256-257) argues that the impossibility of stranding a PP complement of an AP, which is shown in (9b) below, means that V-A forms are lexical units formed in the lexicon rather than derived by incorporating the adjectival head of a resultative predicate into the main verb; that is, V-A forms are not instances of syntactic incorporation. Also, following Baker's (1985: 9) claim that "nominal gerunds" (*V-*

[1] In addition to these two types, Bolinger (1971: 72-73) also discusses the V-A form that consists of an "empty causative verb" and an adjective and expresses the existential sense "to present, reveal, bring on the scene." The examples are: *Have (make, hold, leave, keep) ready the answers./ It renders necessary the measures./ It makes plain the purpose.* We leave this type aside in this paper.

ing of NP) are formed in the lexicon, she says that the data given in (10) below provides positive evidence that V-A forms are formed in the lexicon.

(9) a. He wiped the revolver clean of his fingerprints.
b. *He wiped clean$_i$ the revolver t_i of his fingerprints. cf. He wiped clean the revolver.

(10) a. ??John's continuous pushing of the door open irritated his wife.
b. John's continuous pushing open of the door irritated his wife.

Next, summarized in (5b) is the observation that V-A forms come in two semantic types. In the first type, the adjective in the V-A form overtly realizes the resultant state that the verb inherently expresses. This is the case in (1b) and (2b). For example, in (1b) *bleach white the shirt*, the verb *bleach* is an accomplishment verb that entails the resultant state "white," so the adjective *white* is a redundant expression of the verb's lexical meaning. In (2b) *wipe clean the table*, the verb is not an accomplishment verb, but an activity verb that denotes an activity with a specific purpose, which is in this case the purpose of making something clean. The adjective overtly realizes that presupposed purpose of the verb. In the words of Bolinger (1971: 74), the verb and adjective of this type of V-A form "represent some kind of cause-effect relationship in which the effect is more or less intrinsic to the cause."

The second semantic type of the V-A form is represented by (3b) and (4b). Basically, the verb is a "force exertion" verb like *blow, fling, jerk, jiggle, pull, push, squeeze, throw, wave*, and *wiggle*, and the adjective expresses disconnection or connection as in *clear, free*, *loose, open*, and *shut*. The example in (3a), *push open the door*, is a representative case of this type. The verb in (4a), *slam shut the boot*, differs from (3a) only in that it expresses force exertion accompanied by a sound emission event.

Finally, as stated in (5c), the V-A form always has a corresponding resultative construction, but not vice versa. This property of the V-A form is usually accounted for in terms of the semantic characterization discussed above. That is, it is argued that a resultative construction allows a V-A form only when either of the two semantic conditions in (5b) is met. Compare the data in (11) with the data in (12) below. In (11), we have both resultative constructions and V-A forms, but the resultatives in (12) do not have corresponding V-A forms.

(11) a. John drained dry the glass. cf. John drained the glass dry.
b. They cut short the interview. cf. They cut the interview short.
c. He whittled short the stalk. cf. He whittled the stalk short.
d. He's {planing/buffing/sanding} smooth the boards.
cf. He's {planing/buffing/sanding} the boards smooth.
e. Mary scrubbed clean the floor. cf. Mary scrubbed the floor clean.
f. She sucked dry the orange. cf. She sucked the orange dry.
g. In the same instance he flung open the car door. cf. He flung the car door open.
h. The old man blew clear a pipe. cf. The old man blew a pipe clear.
i. The prisoner jerked free his wrist. cf. The prisoner jerked his wrist free.
j. William snapped shut the lock. cf. William snapped the lock shut.
k. John creaked open the school gate. cf. John creaked the school gate open.

(12) a. *Father painted white the fence. cf. Father painted the fence white.
b. *Mother dyed black her hair. cf. Mother dyed her hair black.
c. *She shook awake her husband. cf. She shook her husband awake.

d. *John hammered flat the metal. cf. John hammered the metal flat.
e. *The horses dragged smooth the logs. cf. The horses dragged the logs smooth.
f. *Stefan ate clean his plate. cf. Stefan ate his plate clean.
g. *He danced sore his feet. cf. He danced his feet sore.
h. *The chef cooked black the kitchen wall. cf. The chef cooked the kitchen walls black.

((11)-(12) from Taniwaki 2006: section 4.2)

The V-A forms in (11a-f) satisfy the semantic condition in (5bi), while the V-A forms in (11g-k) satisfy the semantic condition in (5bii). For instance, the accomplishment verb *drain* lexically entails the resultant state *dry*, so the V-A form *drain dry* is acceptable. And the V-A form *fling open* is allowed because it combines a force exertion verb and an adjective denoting disconnection. On the other hand, the V-A forms in (12) are unacceptable because they do not satisfy either of the semantic conditions in (5b). In particular, their verbs and adjectives are not in the relation of overt or redundant realization stated in (5bi). For instance, unlike the verb *bleach*, the accomplishment verb *paint* entails not a "white" state but a "colored" state, so unlike the form *bleach white*, the form *paint white* is unacceptable, as shown in (12a). The V-A forms *shake awake* and *hammer flat* in (12c, d) are unacceptable because their head verbs of an activity type have no intrinsically determined purpose to be realized by an adjective.

On the basis of these three observations in (5), Kanemoto (2002) and Taniwaki (2006) conclude that the V-A form is a compound verb; more strictly, Kanemoto calls it an "activity-result compound" and Taniwaki a "lexical compound." The compounding analysis will be critically examined and shown to be untenable in the next section. Bolinger (1971: chapter 6), on the other hand, proposes a view that that the V-A form is a particle verb, showing that the adjectives used in this form "are entitled to be classed with the particles that are used in phrasal verbs" (Bolinger ibid.: 71). In section 4, we will show that this view is correct for some of the V-A forms, but there exists other V-A forms that do not conform to the particle-verb analysis either.

3. [V-A]v forms as compound verbs

In this section, we will examine the implications of analyzing V-A forms as compound verbs and will demonstrate that such an analysis has at least three serious problems: the absence of verbal compounding in English, the systematic right-headedness of English endocentric compounding, and the non-homogeneous nature of V-A forms.

3.1. Verbal compounding in English

The phenomenon we are discussing is significant for the proper demarcation of English compounding. The property of V-A forms in (5a), that is, their status as "words," has led researchers to conclude that V-A forms are compound verbs. For example, Taniwaki (2006: 253) claims that V-A forms are "compound verbs formed in the lexicon," and the compounding is conditioned by the semantics. However, this analysis is in direct contradiction to the traditional view that verbal compounding is basically impossible in English. Witness the following quotations:

(13) a. In English, root compounds can be found consisting of combinations of the open categories N, V, and A;
N N (*file cabinet*), N A (*sky blue*), A A (*icy cold*), A N (*hard hat*),
A V (*dry farm*), N V (*handmake*), V N (*drawbridge*), V V (*stir-fry*)

> Of these, only the first four types are productive, with N N compounds being by far the most productive compound type in English. Compounds containing V as one or both members are barely productive. (Lieber 2005: 378; underlines added)

b. [V]erbal compounds with nouns as non-heads are impossible in English, and […] verbs cannot incorporate adjectival/adverbial non-heads. For instance, neither *read a book*, *steal a car* nor *drive fast*, *move slowly* can be readily turned into compounds (**bookread*, **carsteal*, **fastdrive*, **slow(ly)-move*), whereas nominalized verbs and their arguments (as in *the reading of books*, *a driver of trains*) and deverbal adjectives and their adverbial/adjectival modifiers are happily condensed to compounds (*book-reading, train-driver, a fast-driving chauffeur, a slow-moving animal*). (Plag 2003: 154-155)

c. With the exception of verbs with preposed particles, verbal composition did not occur in Old English and does not seem to have existed in Germanic at all. […] Verbal composition does not exist in Present-day English either, though such verbs as *spotlight, blacklist, stagemanage* seem to contradict us. (Marchand 1969: 100-101)

According to Lieber (2005), of all the theoretically possible patterns of compounding shown in (13a), the underlined patterns that include V are unproductive. In (13b), Plag (2003) says that compound verbs with nominal, adjectival, or adverbial non-heads are impossible in English. In addition, as in (13c), Marchand (1969) argues that the absence of verbal compounding is a property of English as a Germanic language.

Notice that the verbs cited in (14) below might seem to be compound verbs as mentioned in (13c), but actually they are verbs derived by the three word-formation processes given in (15), that is, back-formation, conversion, and inversion. Therefore, the existence of verbs like those in (14) does not go against the descriptions we have seen in (13).

(14) a. N + V: to ghost-write, to head-hunt, to spoon-feed, to spotlight, to stage-manage
b. A + V: to blacklist, to cold-call, to dry-clean, to free-associate, to shortcut
c. V + V: to batter-fry, to stir-fry
d. Particle + V: to backfill, to download, to input, to upshift

(15) a. Back-formation stage-manager → to stage-manage, spoon-fed→ to spoon-feed
b. Conversion spotlight$_N$ → to spotlight, blacklist$_N$ → to blacklist
c. Inversion load down → download$_{N/V}$, put in → input$_{N/V}$ (Berg 1998)

In sum, the first serious problem of the compounding analysis of the V-A form lies in the absence of verbal compounding from the system of compounding of English.

3.2. Right-hand Head Rule

The second problem of the compounding analysis is that English word-formation generally conforms to the Righthand Head Rule cited in (16) below. Except for a small number of category-changing prefixes like *de-* and *en-* (e.g. *debug, entomb*), English endocentric complex words are right-headed (cf. Booij 2005:78, Scalise 2008).

(16) Righthand Head Rule

> In morphology, the head of a morphologically complex word is the righthand member of that word. (Williams 1981: 248)

Endocentric compounding in English also conforms to this rule; according to Lieber's (2009) comprehensive survey of the possible types of compounds in English, endocentric compounds

are always right-headed in this language. Then, if the compounding analysis were correct and the operating process were really compounding, the output compound should be not in a V-A form like *to bleach white*, but in an A-V form like **to white bleach*. However, as we can see in (17a) below, this right-headed form is unacceptable. Similarly, the examples in (17b) show that the right-headed versions of the V-A forms given in (2b)-(4b) are all unacceptable. In fact, A-V compounding seems to be more difficult than N-V compounding in English, for N-V compound verbs like *to truck-drive* are allowed if embedded in synthetic compounds, as shown in (18a) below, but A-V compound verbs are not allowed even under embedding, as shown in (18b).[2] That is, unlike N-V compound verbs, A-V compound verbs do not even have the "embedded productivity" (Booij 2009: 212-214).

(17) a. *Mother white-bleached the shirt. cf. (1b)

b. *to clean-wipe, *to open-push, *to shut-slam cf. (2-4b)

(18) a. N+V: *to truck-drive, *to tax-pay vs. truck-driving, tax-payer

b. A+V: *to flat-hammer vs. *flat-hammered metal (Adam 2001: 94)

As we will see in section 4.1, the V-A form is a left-headed lexical unit (e.g. *My mother {bleached white/*bleach whited} the shirt*). Proponents of the compounding analysis might claim that the V-A form is an exceptionally left-headed compound verb, but allowing for the left-headedness just for this type is obviously not a constructive analysis. It has no advantage except the viability of the compounding analysis, while it incurs the serious disadvantage of obliterating the systematic right-headedness of English endocentric compounding.

3.3. Classification

Thirdly, the compounding analysis treats V-A forms as a single unitary category, but the following observations suggest that such indiscriminative treatment is not appropriate:

(19) a. The V-A form of the type in (5bi) — the *bleach white* type — is unproductive, and some native speakers do not accept its attested instances.

b. The V-A form of the type in (5bii) — the *push open* type — is very productive and can be formed freely without referring to the corresponding resultative constructions. Its instances are consistently accepted by native speakers.

In section 2, we saw that V-A forms come in two semantic types; the V-A forms in (1b) and (2b) conform to the semantic condition in (5bi), while those in (3b) and (4b) observe the semantic condition in (5bii). These two semantic types differ also in productivity and acceptability. As stated in (19a), the V-A form of the semantic type in (5bi), which we will call "the *bleach white* type" for convenience, is unproductive, and native speakers' judgments on its instances are not consistent. That is, attested V-A forms of the (5bi) type can be rejected by native speakers. Hence, Bolinger (1971: 76-77) says that the *bleach white* type of V-A form is idiomatic and exhibits dialectal preferences and a sensitivity to the register. In contrast, as stated in (19b), the V-A form of the semantic type in (5bii), which will be called "the *push open* type" hereafter, is

[2] Notice that the following verbs have a meaning that refers to the corresponding compound noun (e.g. *to whitewash*: "to cover something with *whitewash*"), so they are not A-V compound verbs but derived verbs converted or back-formed from the compound noun:

(i) to broadcast, to cold-call, to deep-freeze, to deep-fry, to double-check, to dry-clean, to dry-cure, to dry-fly, to dry-fry, to dry-shave, to dry-spin, to free-associate, to free-fall, to rough-cast, to rough-ride, to shortcut, to still-burn, to still-hunt, to whitewash (Nagano 2009)

very productive, and its examples are accepted consistently by native speakers. Taniwaki (2006: 268, 275) also notices the high productivity of the *push-open* type, mentioning that this type of V-A form can be "immediately formed and used in the appropriate context without referring to the corresponding resultative constructions." These differences in productivity and acceptability suggest that the *bleach-white* type and the *push-open* type should be treated as distinct linguistic forms.

The bifurcation of V-A forms into two different linguistic categories is also supported by the disjunctiveness of the semantic generalization of V-A forms given in (5b). For the *bleach white* type, the resultant state entailed by the verb is crucial, while in the *push open* type, the verb is an activity verb. Such a disjunctive generalization is very hard to reconcile with any unitary analysis of V-A forms, so it constitutes a serious problem not only for the compounding analysis but also for Bolinger's (1971: chapter 6) particle-verb analysis discussed at the end of section 2. In the next section, we will show that the *bleach white* type is a lexicalized verb, while the *push open* type is a particle verb.

4. [V-A]v forms as a heterogeneous category

In the previous section, we have revealed the following two things. First, V-A forms are lexical units, but they are not compounds. Second, V-A forms consist of (at least) two different types of lexical units. In this section, we will advance a new analysis that can account for not only these two findings but also other various properties of V-A forms. The basic insight we draw on here is that being a lexical unit does not necessarily mean being formed by a morphological process, and the lexicon can be expanded in non-morphological ways.

4.1. The *bleach white* type as a lexicalized verb

In section 3.3, we argued that the *bleach-white* type and *push-open* type of V-A forms need differentiated treatment. To begin with the first type, we would like to propose that V-A forms of the *bleach white* type arise from resultative constructions via the process of lexicalization. The term "lexicalization" has both synchronic and diachronic meanings. Synchronically, it refers to the listing of an item in the lexicon, while diachronically, it refers to phonological, semantic, or syntactic changes of an item (Hohenhaus 2005: section2; see also Brinton and Traugott 2005). Items to be lexicalized are most commonly complex words (e.g. Bauer 1983: chapter 3), but as the researchers cited below claim, syntactic phrases can also be lexicalized in both of the two senses.[3]

(20) a. [P]hrases of fixed forms, after being generated above the X^0-level in syntax, enter the lexicon and are listed as such in the lexicon, and they undergo reanalysis as lexical categories. (Shimamura 2003: 643)

e.g. [P-the-N]$_{PP}$, [P-a-N]$_{PP}$: *over the fence gossip, in a row nests*

[V-the-N]$_{VP}$: *a connect the dots puzzle*

[N-P-a-N]$_{NP}$: *a floor of a birdcage taste* (ibid.: 632-633)

[3] The phrasal lexicalizations discussed in Sauer (2004: 1625-1628) and Fischer (2007: 80) (e.g. Old English *dōmes dæg* > Modern English *doomsday*, the impersonal clause *Me thinks that…* > the verbal form *methinks*) are of a diachronic nature, but in view of their idiosyncrasies, they must have been lexicalized also in the synchronic sense, i.e., they must have been listed in the lexicon.

b. Words like *jack-in-the-box* are best regarded as lexicalized phrases, i.e. they are memorized holistically by the speakers. (Plag 2003: 136)

c. There are complex items that function as words, yet whose internal structure is that of a clause or phrase rather than a compound.

e.g. NPs constituting phrasal words: *jack-in-the-box, stick-in-the-mud*

an AP constituting a phrasal word: *dyed-in-the-wool*

VPs constituting phrasal words: *couldn't-care-less, has-been, wannabe, forget-me-not* (Carstairs-McCarthy 2002: 67-69)

In particular, Shimamura (2003: 644), cited in (20a), argues that "the lexicalization of syntactic phrases of fixed forms can be accounted for by assuming that after such phrases are generated in syntax, they enter the lexicon, undergo the process of reanalysis, and are listed there as idioms which are X^0s." According to her, the underlined expressions in the compounds in (20a), such as *over the fence*, *connect the dots*, and *floor of a birdcage*, result from the reanalysis of a PP, VP, and NP as adjectives in the lexicon; more specifically, they are words created by applying reanalysis rules in the form of "Adj → $[P–the–N]_{PP}$" to syntactic phrases. The same author also shows in Shimamura (1986, 2000) that A-*to*-V compounds such as *easy-to-understand instructions*[4] and genitive compounds such as *woman's magazine* can each be analyzed as lexical units created by the lexicalization of syntactic phrases. Given the validity and prevalence of lexicalization as a way to produce a lexical unit from a syntactic unit, it would not be too far-fetched to hypothesize that a similar process is involved in our case as well. That is, we hypothesize that the V-A form of the *bleach-white* type arises when the resultative construction enters the lexicon and gets reanalyzed as a lexical category.

The lexicalization analysis can account for morphological and semantic properties of the *bleach-white* type as well as its low productivity. First, as the following examples show, an inflectional morpheme attaches not to the V-A form as a whole but to the V element. This fact means that V-A forms are perceived as left-headed lexical units. The left-headedness makes sense if the V-A forms are lexicalizations from syntactic phrases, which are left-headed in English.

(21) a. My mother {bleached white/*bleach whited} the shirt.

b. Mary {wiped clean/*wipe cleaned} the floor.

Carstairs-McCarthy (2002: 67) argues that the word status of *jack-in-the-box* (see (20b, c)) manifests itself in its plural form *jack-in-the-boxes*, where the plural morpheme attaches not to the head noun but to the whole expression. However, we have to notice that the internally inflected plural form *jacks-in-the-box* is also listed in dictionaries alongside the above form. Notice also that according to dictionaries, similar nominal expressions *jack-in-a-bottle* "long-tailed tit," *jack-in-a-box* "cuckoopint," *jack-in-office* "arrogant official," *jack-in-the-green* "participant in traditional May Day parades," and *jack-in-the-pulpit* "cuckoopint" all form their plural form by inflecting the head noun: *jacks-in-a-bottle*, *jacks-in-a-box*, *jacks-in-office*, *jacks-in-the-green*, and *jacks-in-the pulpit*. As long as these *jack*-expressions are best analyzed as lexicalized phrases, it must be the case that lexicalization does not (necessarily) nullify the internal structure of an input phrase.

[4] According to Shimamura (1986: 31-32), this type of lexicalized phrase exhibits certain variation in native speakers' acceptability judgments. Her informants all accepted *easy-to-understand instructions* and *a hard-to-master language*, but some of them were reluctant to accept *a comfortable-to-wear jacket*, *an interesting-to-read book*, and *a difficult-to-master language*. Notice that the *bleach-white* type of V-A form also exhibits variation in acceptability, as we discussed in (19a).

Second, the lexicalization analysis can account for the fact that adjectival passives based on resultative constructions are possible when the corresponding V-A forms are possible. According to Jackendoff (1990: 236), resultative phrases cannot in general be found in adjectival passives; he says that the adjectival passives given in (22a) below are either "at best marginal" or unacceptable. The instances in (22b) below are also rejected by Levin and Rappaport (1995: 43).

(22) a. ??swept-clean room, ??squashed-flat grapes, *washed-clean clothes,
*watered-flat tulips (Jackendoff 1990: 236)

b. *the run-thin pavement, *a ticked-awake baby, *a drunk-dry teapot
(Levin and Rappaport 1995: 43)

However, there do exist some adjectival passives based on resultative constructions (Levin and Rappaport 1995: 43-44). Compare the examples given in (23a) below with those in (23b). Our informants rejected the adjectival passives in (23a) but accepted those in (23b). The latter two instances in (23b) and the example *the pounded-thin beef* are also accepted by Levin and Rappaport (ibid.).

(23) a. *a painted-white wall, *a hammered-flat sword

b. a bleached-white shirt, a wiped-clean table, pounded-flat metal

This acceptability difference neatly correlates with the existence of the V-A form; the adjectival passives in (23b) have corresponding V-A forms (e.g. *to bleach white, to wipe clean*), while those in (22) and (23a) do not (**to paint white*, **to run thin*). That is, this type of adjectival passive cannot be formed without a V-A form listed in the lexicon. For instance, *a bleached-white shirt* is possible because the verb *to bleach-white* is listed in the lexicon, while **a run-thin pavement* is impossible because we do not have the verb **to run-thin* in the lexicon.

The strongest support for the lexicalization analysis comes from the semantic properties of the *bleach-white* type. Unlike the *push-open* type, this type of V-A form is not synonymous with the corresponding resultative constructions. Specifically, the *bleach-white* type can express an idiomatic meaning absent from the resultative counterpart and exhibit a semantic change that can be called "anti-resultativization." To begin with the idiomaticity, the semantic contrast shown in (24) below provides a simple but clear demonstration. While the resultative construction *to cut something short* expresses the compositional meaning "to make something short by cutting," the lexicalized form *to cut short something* has an idiomatic meaning "to bring something to a sudden end." The latter meaning cannot be expressed by the resultative.

(24) a. to cut …. short "to make short by cutting"
e.g. I can't decide whether or not to cut my hair short.

b. to cut short "to bring to a sudden end" (*OED*)
e.g. Death suddenly cut short his promising life.

In addition to the idiomaticity, the *bleach-white* type of V-A form differs from the corresponding resultative construction in that it does not entail a resultant state, expressing only an activity with a specific purpose. Witness the contrast shown in (25a, b) below. A resultative construction cannot be canceled, but the cancellation is possible in the *bleach-white* type of V-A form. Importantly, the *push-open* type of V-A form is similar to the corresponding resultative construction in that it disallows cancellation, as shown in (26).

(25) a. *John bleached the shirt white, but the stain remained.

b. John bleached white the shirt, but the stain remained.
cf. *John hammered the metal flat, but it didn't become flat.

(26) a. *John pushed the heavy door open, but it didn't move.
b. *John pushed open the heavy door open, but it didn't move.

This observation suggests that while the *push-open* type is aspectually similar to the corresponding resultative construction, the *bleach-white* type is not; it is not an accomplishment verb but an activity verb.

Additional data based on Dowty's (1979) criteria for the aspectual classification confirm this conjecture. According to Dowty (1979), activity verbs occur with a time adverbial phrase headed by *for*, while accomplishment and achievement verbs take a time adverbial phrase headed by *in*, as shown in (27) below. Similarly, as show in (28) below, activity verbs differ from accomplishment verbs in that they cannot occur with the verb *finish*.

(27) a. John walked for an hour./(*) John walked in an hour.
b. ?John painted a picture for an hour./John painted a picture in an hour.
c. ??John noticed the painting for a few minutes. /John noticed the painting in a few minutes. (Dowty 1979: 56-58)

(28) a. John finished painting a picture.
b. *John finished walking. (Dowty 1979: 57-59)

Witness our informants' judgments shown in (29) and (30) below. As shown in (29) and (30a, b), the *bleach-white* type of V-A form takes a *for*-phrase rather than an *in*-phrase and cannot occur with *finish*, so it must be an activity verb. This means that unlike the resultative phrase *bleach the shirt white*, the lexicalized verb *to bleach white the shirt* means to "do a certain type of washing activity to the shirt in order to make it white," without implying the accomplishment of the purpose. On the other hand, the *push-open* type of V-A form is an accomplishment verb and entails a resultant state, as shown in (30c, d).

(29) a. John bleached white the shirt for an hour.
b. ??John bleached white the shirt in an hour.

(30) a. John finished bleaching the shirt white.
b. *John finished bleaching white the shirt.
c. John finished pushing the heavy door open.
d. John finished pushing open the heavy door.

To summarize the discussion so far, the *push-open* type of V–A form is basically synonymous with its separate form, but the *bleach-white* type of V–A form is peculiar in its idiomatic meaning and "anti-resultative" semantics. These peculiarities can be attributed to the lexicalized status of the *bleach-white* type. It is generally observed that "words, when embedded in complex words, lose their referential potential (in fact, it is not words but phrases that refer to something)" (Booij 2005: 188). Then, it must be the case that when the V-A sequence as a whole is reanalyzed as a word, the adjective within loses its referential potential and cannot express an independent stative event.[5] If so, the semantic difference between the V-A form *bleach white the shirt* and the resultative *bleach the shirt white* is similar to the semantic difference between the

[5] Closely related to the loss of referential potential is the observation that nouns inside words are interpreted in a generic sense and do not refer specifically to particular entities. For example, *lion* in the compound noun *lion-hunter* refers to the class "lion" generally. Shimamura (2003: 635) shows that nouns in lexicalized phrases also have generic interpretations, hence the following contrast: *an after-the-party mess* vs. **an after-the-party-given-by-Bill mess*. Our assumption here is that a similar change of interpretation should occur also in adjectives when they are put inside words.

derived verb *shorten* and the verb phrase *make (something) short*. For instance, *to shorten the skirt* means to "make the skirt shorter" rather than to "make the skirt short"; that is, the adjective incorporated into the word is no longer referential and so cannot denote a specific type of shortness.

Finally, the low productivity of the *bleach-white* type and its variability of native speakers' judgments, which we saw in (19a), can also be accounted for by the lexicalization analysis. First of all, the lexicalization process, whether it is synchronic or diachronic, is not an obligatory process that applies to all the relevant forms. Shimamura's (2003) reanalysis rules (e.g. Adj → [P-the-N]$_{PP}$), for example, do not apply to all the syntactic phrases with the specified structure. In addition, being a word, a lexicalized phrase should observe the nameability requirement, a pragmatic requirement imposed on words (Bauer 1983: 86-87). Nameability of a concept crucially depends on how well the concept is established in the language society. For instance, Kato and Kageyama (1998: 314) point out that in order for a [XP-N] form to achieve the lexical status as a phrasal compound, the reanalysis of the modifier XP along the lines of Shimamura is not sufficient; they argue that it is necessary that "a whole modifier-head unit (e.g. *inside-the-park homerun*) should be established as a conventional concept in the language society."

Similarly, in our case, a resultative construction can be lexicalized as a V-A form only when the activity associated with it is established as a conventional activity. If this view is on the right track, the lexicalization analysis can explain that the following V-A forms, mostly repeated from (12), are unacceptable because they do not fulfill the nameability requirement:

(31) a. Weak resultatives: *to paint white the fence, *to dye black the hair,
*to shake awake husband, *to hammer flat the metal

b. Strong resultatives: *to dance sore one's feet, *to cook black the kitchen wall,
*to drink dry the teapot (vs. to drink the teapot dry),
*to run thin the pavement (vs. to run the pavement thin)

A lexicalized V-A form expresses to "do a certain activity in order to bring about a certain state," but such activities associated with these examples are not perceived as conventional enough to deserve naming. Take the V-A form **to paint white* given in (31a), for instance. Kanemoto (2002: 93) and Taniwaki (2006: 266-267) attribute the unacceptability of this form to the lack of the relation of overt semantic realization between V and A (see (5bi)), but in our view, this V-A form could become acceptable if the activity it denotes is established as a convention for one reason or another. For example, it could be accepted by members of a theatrical circle where doing a certain type of painting to an actor's face to make it white is established as a conventional procedure. Notice that not only the so-called strong resultatives but also weak resultatives (Washio 1997) cannot be lexicalized unless they attain the nameability. The factor that distinguishes between acceptable and unacceptable V-A forms is not the weak vs. strong distinction of the corresponding resultative construction, as implied in Taniwaki (2006: section 4), but the extralinguistic appropriateness of the naming.[6]

A similar claim is made by Bolinger (1971: 76), who argues, as we mentioned in section 3.3, that "idiomaticity" is a factor that makes many theoretically possible V-A forms of the *bleach-white* type unacceptable. According to him, the following contrast is due to the extralinguistic fact that extension is normal for width but not for length:

[6] Hence, acceptable V-A forms of the *bleach-white* type come from both weak and strong resultatives: e.g. Weak: *to bleach white (the shirt)*, Strong: *to pound soft (the clay)* (Bolinger 1971: 75).

(32) a. They stretched (pulled, spread, drew) wide the fabric.
b. *They stretched (pulled, drew) long the rope. (Bolinger 1971: 76)

To put this claim differently, the V-A forms in (32a) is acceptable because it denotes a conventionalized activity, but the activity denoted by the V-A forms in (32b) is not conventional and so is not nameable.

Given this extralinguistic property of lexicalization (see also Lipka 1992),[7] it is only natural that V-A forms of the *bleach-white* type cannot be formed freely and can be judged differently among native speakers.[8]

4.2. The *push open* type as a particle verb

As we mentioned in section 2, Bolinger (1971: chapter 6) claims that particles used in the so-called phrasal verbs are not restricted to the class "Adprep" (adverbs that function also as prepositions; e.g. *away, in, out, over*) and proposes a hypothesis that the V-A form belongs to the phrasal verb. In this section, we will show that this hypothesis is correct as long as the *push-open* type of V-A form is concerned.

In the preceding section, we have seen that unlike the *bleach-white* type, the *push-open* type of V-A form is basically synonymous with the corresponding separate form; neither of the forms allows cancellation, as in (26), and both of them can occur with the verb *finish*, as in (30c, d). This semantic synonymy and the high productivity we saw in (19b) can be accounted for if the *push-open* type of V-A form and its separate form are realizations of the same particle verb construction. That is, we propose that the V-A form *to push open the door* and its separate form *to push the door open* correspond respectively to the adjacent and separate forms of a canonical particle verb combination exemplified below.

(33) a. John pulled off the leeches.
b. John pulled the leeches off.

Particle verb constructions such as the one in (33) are generally considered to have a hybrid character, the adjacent form in (33a) behaving as a lexical unit and the separate form in (33b) behaving as a syntactic combination. There exists a considerable amount of literature on this hybrid character of the particle verb construction (see, for instance, Dehé et al. 2002, Spencer 2005: 79-81, among others), and we cannot go into a detailed examination of the relevant

[7] Lipka (1992: 7-8) cites the high frequency of use as a necessary condition for lexicalization. Also he says that lexicalization depends on "different regional, social, stylistic and other varieties of a language."

[8] Although we cannot go into details in this paper, we should clarify conditions for lexicalization not only from semantic and pragmatic points of view, but also from a structural viewpoint. The existence of structural constraints on the lexicalization of a V-A form is indicated by the fact that a *depictive* type of V-A form was totally unacceptable for any of our informants:

(i) *John ate raw the fish. (vs. John ate the fish raw.)

The following data indicate that a resultative predicate is structurally closer to the main verb than a depictive predicate:

(ii) John hammered the metal flat hot. (cf. McNulty 1988: 38)

The depictive predicate *hot* cannot precede the resultative predicate *flat* in this sentence. Also, the *do-so* test demonstrates that a resultative predicate forms the smallest constituent with the verb, but a depictive predicate does not:

(iii) a. John ate meat raw, and Tom did so rare.
b. *John painted a house red, and then Tom did so blue. (Hoshi 1992: 9)

previous studies. One thing that we are convinced of, however, is that the adjacent Verb-Particle form such as *to pull off (the leeches)* cannot be formed morphologically in English; they cannot be analyzed as compound verbs for the same reasons that we offered in section 2 as objections against the compounding analysis of the V-A form (see also Zeller 2002: 255-256). English morphology does not allow compound verb formation, and English endocentric compounds are right-headed. If the compounding analysis for the particle verb were correct, the output should be **to off-pull* rather than *to pull off*, but the Particle-Verb sequence is generally not allowed in English (see Berg 1998, Ackema and Neeleman 2004: 159-160).[9] Then, we need to treat the Verb-Particle form as a lexical unit formed non-morphologically. In fact, not a few researchers propose theories of the particle-verb construction that are consistent with this status of the Verb-Particle form. For instance, Booij (2002) proposes that particle verbs are "constructional idioms" in the form "[X [ ]$_V$]$_V$, where X = P, Adv, A or N" that are created in the lexicon. He says that this is "the formation in the lexicon of units that are functionally identical to complex words, but do not form one grammatical word, but two" (Booij 2002: 40). The status of the Verb-Particle form as a non-morphological lexical unit can also be accounted for by Zeller's (2002) syntactic approach, which claims that particle verbs basically have a VP structure, but they can also have a V^0 structure when the phrasal structure is reanalyzed as a complex head.

Let us proceed to the particle-verb analysis of the *push-open* type of V-A form. Our claim is that the *push-open* type acquires its lexical status in the same way as the adjacent form of a particle verb construction does so (see above). To begin with, the right-headed form of this type (e.g. **to open push*; see (17b)) is unacceptable because the Particle-Verb form is unacceptable in English, as we have discussed just above. Secondly, as we saw in (5bii), the *push-open* type consists of a force exertion verb such as *jerk*, *pull*, *push,* and *throw,* and one of the disconnection adjectives in the set {*clear, free, loose, open, shut*}. These adjectives qualify as particles in that they form a closed class and express a change of location; Bolinger (1971: 85) defines the particle semantically as follows: "the particle must contain two [semantic] features, one of motion-through-location, the other of terminus or result." The disconnection adjectives can be conjoined with adverbial particles, as in *With a bound he was away and free* (Bolinger 1971: 68). Next, consider the following data concerning the morphosyntactic properties of the *push-open* type and particle verbs:

(34) a. John pulled {loose the leeches / the leeches loose} and Tom the seaweed.
b. John pulled {off the leeches / the leeches off} and Tom the seaweed.

(35) a. John pushed {*wide open the door / the door wide open}. (Taniwaki 2006: 255)
b. Fran put {*right together the model airplane / put the model airplane right together}. (Jackendoff 2002: 71)

(36) a. ??John's continuous pushing of the door open irritated his wife. [= (10a)]
b. John's continuous pushing open of the door irritated his wife. [= (10b)]
c. *The rapid looking of the information up is important.
d. The rapid looking up of the information is important. (Jackendoff 2002: 72)

[9] According to Berg (1998: section 4), the difficulty of the Particle-Verb sequence in English arises from its word order pattern of SVO. As cautioned in Ackema and Neeleman (2004: 160), verbs such as *outperform*, *overact*, and *underfeed* are not related to the particle verb construction (e.g. **to perform out*, **to act over*, **to feed under*). They are verbs derived by prefixation.

These data show that the *push-open* type exhibits the same morphosyntactic properties as particle verbs. The sentences in (34) attest to the equal possibility of gapping, and those in (35) and (36) speak for the lexical status of their adjacent forms; the adjacent forms of the *push-open* type and particle verb both observe the Principle of Lexical Integrity, and they permit the nominalization by the derivational suffix *-ing*, or the formation of the "nominal gerund," in contrast to the separate forms. In addition to this parallelism, our claim that one should distinguish the *push-open* type of V-A form and particle verbs from the *bleach-white* type of V-A form is confirmed by the contrast between the derivatives in (37a, b) and those in (37c) given below.

(37) a. passer by, come outer, cleaner upper (Ackema and Neeleman 2004: 160-161)
washer-up, let-downer, washer-upper, clean-uppable (*WebCorp*)
b. pusher-open, push-opener, a real slam-shutter, pull-openable
c. ??bleach-whitable, *bleachable-white, ??a cut-shortable tutorial

It is well known that the position of a derivational suffix attached to a particle verb is variable, which is shown in (37a). Our informants' data given in (37b) show that the *push-open* type exhibits the same positional variability of a derivational suffix. Similar derivatives can be found also in the *WebCorp*, a corpus on the Internet (see [http://www.webcorp.org.uk/]). The *bleach-white* type of V-A form, on the other hand, strongly resists any further derivation. Derivatives such as those given in (37c) were never accepted by our informants nor were rarely found in the *WebCorp*. Notice that this is another similarity between the *bleach-white* type of V-A form and lexicalized phrases in general; the lexicalized phrases cited in (20) also resist undergoing derivation (e.g. **over-the-fenceness*, **jack-in-the-boxish*, **dyded-in-the-woolness*, ?*has-beenish*).

Fourth, the formal separability of particle verbs as well as the *push-open* type does not affect their aspectual property. Consider the following sentences:

(38) a. *John pulled the leeches off, but they still stuck to him.
b.*John pulled off the leeches, but they still stuck to him.
c. *John pushed the heavy door open, but it didn't move. [= (26a)]
d. *John pushed open the heavy door open, but it didn't move. [= (26b)]
e. *John bleached the shirt white, but the stain remained. [= (25a)]
f. John bleached white the shirt, but the stain remained. [= (25b)]

(39) a. John finished pulling the leech off.
b. John finished pulling off the leech.
c. John finished pushing the heavy door open. [= (30c)]
d. John finished pushing open the heavy door. [= (30d)]
e. John finished bleaching the shirt white. [= (30a)]
f. *John finished bleaching white the shirt. [= (30b)]

As in (38a, b), the adjacent and separate forms of a particle verb both refuse cancellation, and as in (39a, b), they both allow the co-occurrence with the verb *finish*. This fact means that the adjacent and separate forms of a particle have the same aspectual property. As the additional sentences given in (38c-f) and (39c-f), repeated from section 4.1, show, this aspectual stability is shared by the *push-open* type of V-A form, while the *bleach-white* type of V-A form undergoes the anti-resultativization semantically. Bolinger (1971: 82) claims that the adjacent and separate forms of a particle verb are semantically different in that "though the phrasal verb embodies both the action and the result, the position of the particle tends to make one or the other

paramount." According to him, the preposed particle makes the action paramount, whereas the postposed particle makes the result paramount. However, the on-going discussion shows that this difference is no more than a difference in focus and does not affect the aspectual property of a particle verb.

Lastly, the *push-open* type of V-A form and its separate form are similar to the two forms of a particle verb construction in that both forms are accepted and used equally freely. Witness the following data, where we compare three native speakers' judgments on the *bleach-white* type of V-A form, the *push-open* type of V-A form, and the adjacent form of a particle verb:

(40)

	Bleach white type	*Push open* type	*Pull off* type
a Canadian speaker	OK in some cases	OK	OK
an American speaker	OK in passive	OK	OK
a British speaker	unacceptable	OK	OK

cf. The separate forms (V…A/P) were accepted in all of the three types.

The three informants are all university-level English teachers and come from Canada, America, and Britain respectively. After we confirmed that they accept the separate V…A/P forms (e.g. *Mary bleached the shirt white/ Bill pushed the door open/ Tom pulled the leech off*), we asked them to judge the acceptability of the adjacent counterparts. As we can see, their judgments on the *bleach-white* type of V-A form were inconsistent, but they accepted the other two types consistently and without any hesitation. To be more specific with the results of the *bleach-white* type, the Canadian speaker accepted some of its instances (e.g. *Mary bleached white the shirt.*) but rejected others (e.g. *Kill dead the cockroach!*). The American speaker mentioned that the instances are permissible if used in passive, while the British speaker rejected all the instances of this type of V-A form. Such inconsistencies among native speakers were not observed in the other two types of adjacent forms, which were always accepted by all of the three informants. It is also significant to note that examples of the V-A form based on a depictive construction were totally and consistently rejected by all of the three informants (e.g. **John ate raw the fish* vs. *John ate the fish raw*). Compared with the crystal-clear rejection observed in this case, the inconsistent acceptability of the *bleach-white* type should be attributed not to some structural factors but to the pragmatic considerations involved in lexicalization we discussed in section 4.1 (see also Note 8).

In sum, we have argued that the *push-open* type of V-A form and its separate counterpart constitute a particle verb construction. To put this differently, we have argued that certain types of resultative constructions should be treated as separate forms of particle verb constructions. This view receives a straightforward support from data taken from North Germanic languages. Of particular significance is the fact that unlike in English, the position of a particle can be fixed in these languages. In Swedish, for example, particles are fixed in the pre-object position and do not appear in the post-object position, as the following example shows:

(41) a. Han kastade ut böckerna.
he threw out books.the "He threw out the books."
b.*Han kastade böckerna ut
he threw books.the out (Toivonen 2003:105)

Another fact that has a special significance here is that in Swedish resultative constructions, some adjectives always precede objects, as exemplified in (42) below, and other adjectives always appear in the post-object position, as shown in (43) below. Toivonen (2003: 112-132) claims that this distributional bifurcation in constructions expressing resultant states can be accounted

for if we view the adjective in (42) as a particle, or a "non-projecting word." Some adjectives expressing results are in fact particles, while other adjectives, including the adjective in (43), are not.[10]

(42) a. Han slog ihjäl en karl.
he beat to.death a man "He beat a man to death."
b. *Han slog en karl ihjäl.
he beat a man to.death (Toivonen 2003: 22)

(43) a … och klöst honom blodig.
and scratched him bloody "… and scratched him bloody."
b.*… och klöst blodig honom.
and scratched bloody him (Toivonen 2003: 31)

To return to English, the resultative exemplified in (42) corresponds to the *push-open* type of V-A form, while the resultative like the one in (43) corresponds to the usual resultative construction. Since English particles crucially differ from Swedish particles in that they can occur not only in the pre-object position but also in the post-object position, the *push-open* type, which is a particle verb construction, can be realized also in a separate form (e.g. *to push the door open*). That is, due to the "projecting-word" nature of English particles (Toivonen 2003: 166-176), an English counterpart of the pattern in (42b) is acceptable. "True" resultative constructions such as the one in (43a), on the other hand, correspond to many of the resultative constructions in English (e.g. *My father painted the fence white.* / *My mother bleached the shirt white.* / *John hammered the metal flat*), i.e. the resultative constructions whose resultative predicates are not one of the disconnection adjectives. Non-particle adjectives cannot occur in the pre-object position unless phrasal lexicalization takes place, as in the case of the *bleach-white* type of V-A form (e.g. **to paint white the fence*, **to hammer flat the metal*; see also (43b)).

Finally, let us note that views similar to our arguments presented in this paper are found in the literature on North Germanic languages. They can be summarized as follows:

(44) a. The [V-A] adjacent form is a particle verb construction, while the [V…A] separate form is a resultative construction. (Toivonen 2003)
b. The V-Particle adjacent form cannot be viewed as a morphological compound in light of the Righthand Head Rule (see (16)). (Svenonius 1996, Ramchand 2008)
c. "… so-called 'lexical' properties of verbs cannot be confined to a lexical module." (Ramchand 2008: 134)

[10] Some adjectives appear in both pre-object and post-object positions, but they have different interpretations in the two positions, as the following examples show (Toivonen 2003: 116-117):

(i) a. … och rycker lös meningar ur sina sammanhang.
and pulls free sentences out.of their contexts
"and pulls free sentences out of their contexts."
b. Det springer en vargliknande hund lös på Stocksundsbron.
there runs a wolf.like dog free on S.bridge
"A dog who looks like a wolf is running free on the Stocksund bridge."

In the pre-object position in (ia), the adjective *lös* is a particle and expresses a resultative meaning, while in the post-object position in (ib), it has a depictive reading. In the latter case, the adjective cannot be regarded as a particle.

The analysis in (44a) has been discussed just above. The view in (44b) is parallel to our claim that though English V-A forms have the property of lexical integrity, they cannot be treated as compound verbs in view of their left-headedness. According to Ramchand (2008: 133), particles in Swedish do occur in a [Particle-Verb] form, as shown in (45b) below. She argues that this is a morphological compound conforming to the Righthand Head Rule, so the Verb-Particle form in (45a) must be formed in a different, non-morphological way. This view is suggested in (44c); the problem of the Righthand Head Rule, which applies to the morphology, would be avoidable if the lexical status of a Verb-Particle form comes from a non-lexical module. A strong piece of evidence for this view is provided by the Norwegian data given in (46) below. Notice the well-formedness of the sentence in (46a) in contrast to the ill-formedness of the one in (46b), which means that the Verb-Particle adjacent form allows adverbial modification of the particle, a property absent from morphological combinations.

(45) a. Det blev hugget ned många träd.
it became chopped down many trees "Many trees got chopped down."
b. Det blev många träd nedhuggna.
it became many trees down.chopped "Many trees got chopped down."
(Ramchand 2008: 133)

(46) a. Kari sparka heldigvis ut hunden.
Kari kicked fortunately out the.dog "Kari fortunately kicked the dog out."
b. *Kari sparka ut heldigvis hunden.
Kari kicked out fortunately the.dog (Ramchand 2008: 133-134)

5. Conclusions

In this paper, we have taken a close look at English resultative constructions that have alternative forms in which the V and A occur adjacently. On the basis of the morphological, syntactic, semantic, and pragmatic properties of the V-A forms, we have argued that the lexical unit of V-A form is not formed by compounding but arises as an epiphenomenon of the morphology-syntax interaction. The *bleach white* type of V-A form is a lexicalization from a resultative construction, while the *push open* type of V-A form is a type of particle verb construction. We crucially differ from previous studies in our conviction that V-A forms are not a unitary category and that they consist of lexical units formed non-morphologically.

These conclusions confirm the traditional view that genuine verbal compounding is impossible in English, and what appear to be compound verbs are derivatives from various sources. In fact, we have revealed previously unknown ways to form "compound verbs" in English. Traditionally, "compound verbs" in English have been dealt with by means of various word-formation processes such as conversion and back-formation. As we saw in (15), N-V and A-V verbs (e.g. *to stage-manage, to shortcut*) are back-formations or conversions from compound nouns or adjectives, while P-V verbs (e.g. *to download*) are inversions from particle verbs. However, this paper has shown that the means to form "compound verbs" in English may lie outside the morphological component as well as inside it. V-A verbs are either particle verbs or lexicalizations from resultative constructions. The remaining question is: why is it impossible to

form "compound verbs" by compounding per se in English? We leave this question for future research.[11]

Our contribution to theoretical concerns is that we have provided another piece of evidence for the view that lexical units are not equal to morphological constructs. The lexicon can be expanded by non-morphological operations. There exist "words" that are formed outside the morphological component. As we saw in (44c), Ramchand (2008: 134) expresses this view in her claim that "… so-called 'lexical' properties of verbs cannot be confined to a lexical module." Moreover, the existence of non-morphological lexical units like V-A forms strongly speaks for the modification of the notion of Lexical Integrity as a property of X^0 terminals (syntactic atoms) rather than of lexemes (Spencer 2005: 80-81). Such a position is advanced by Ackerman and LeSourd (1997: 99), who claim that "lexical integrity does not hold of lexical items as such, but rather is a property of the zero-level categories specified in lexical representations." Particle verb constructions constitute a classic example of this type of morphology-syntax interaction in English (e.g. Jackendoff 2002), but this paper has revealed the possibility that the notion of lexicalization could be discussed from a similar point of view. That is, lexicalization is not a peripheral phenomenon of merely descriptive value but deserves a serious investigation as an active linguistic mechanism involved in the expansion of the lexicon and in the interaction between morphology and syntax. We may regard Shimamura's studies on phrasal lexicalization (e.g. Shimamura 1986, 2000, 2003) as a starting point for research in such a direction, but a number of significant questions remain to be investigated, including the question of structural and semantic conditions for (phrasal) lexicalization and the distinction between synchronic and diachronic lexicalization. We will tackle on these issues in future works as a necessary step to develop a more articulated theory of lexicalization.

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[11] It is interesting to note that Japanese compound verbs show the opposite possibility; Japanese has "lexical compound verbs" and "syntactic compound verbs," which are formed by the process of compounding applied in the lexical and syntactic components respectively (see Kageyama 2009).

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