Zero Derivation in English: Base-Identity and Constraint Indexation*

Seok-keun Kang
(Wonkwang University)

Kang, Seok-keun. 2007. Zero Derivation in English: Base-Identity and Constraint Indexation. *The Linguistic Association of Korea Journal, 15*(4), 77-96. This paper argues that stress patterns that occur in zero derivation is best analyzed in Optimality Theory (Prince & Smolensky, 1993; McCarthy & Prince, 1995) in terms of faithfulness and lexically indexed markedness constraints. This approach is shown to capture distinctions between generality and exceptionality of stress patterns in zero derivation. Based on a variety of evidence, I argue that zero-derived forms should be faithful to their base, and that exceptions to the patterns are confined only to a restricted set of words. Assuming that a single constraint can be multiply instantiated in a constraint hierarchy, and each instantiation may be indexed to apply to a particular set of lexical items (cf. Fukuzawa, 1999; Ito & Mester, 1999, 2001; Kraska-Szelenk, 1997, 1999; Pater, 2000), I specifically claim that the lexically indexed markedness constraint WORD STRESS$_L$ outranks the faithfulness constraint Base-Identity, which in turn ranks above the general markedness constraint WORD STRESS. It is shown that with the constraint ranking, all the stress patterns that occur in zero derivation can be accounted for straightforwardly. In so doing, I also show that under the analysis adopted in this paper, the prediction that new zero-derived forms always retain the stress pattern of the base is borne out from the high ranking of the faithfulness constraint Base-Identity.

Key Words: zero derivation, deverbal noun, denominal noun, optimality theory, faithfulness, base identity

1. Introduction

This paper reexamines zero derivation in English within the

* This paper was supported by Wonkwang University in 2007. I am grateful to the three anonymous reviewers of this journal for their comments and suggestions. All errors are, of course, my responsibility.

framework of Optimality Theory (henceforth OT; Prince & Smolensky, 1993; McCarthy & Prince 1995). Zero derivation is a derivational process that involves no overt affixation.[1] In other words, a lexical form can have two distinct syntactic and semantic functions. For example, the noun *torment* is derived by zero derivation from the corresponding verb. It has been a common assumption in the literature that in such cases, one of the words is more basic, and the less basic word is derived from it, although there is no overt mark of any derivational relation between them.[2]

In this paper, first reviewing Kiparsky's (1982) analysis of zero derivation couched within the framework of lexical phonology and morphology, I show that his analysis is problematic not only because it cannot make a correct prediction regarding the productivity of zero derivation but also because it does not consider some crucial relevant data, which cannot be accounted for under his analysis. Then, reconsidering zero derivation within the framework of OT, I show that

---

1) This process is also called 'conversion'. Usually the two terms, 'zero derivation' and 'conversion', are used as synonyms, but some linguists like Lyons (1977) differentiate the two terms. For example, Lyons (1977, p. 523) says that the term 'conversion', whereby an item is adapted to a new-word class without the addition of an affix, carries different implications from the term 'zero derivation', which can be understood as implying the addition to the stem of the identity-element functioning as an affix.

2) A difficulty which we have to face in examining zero derivation is that of deciding which of two derivationally related words is to be considered the base and which the derived word. As Sanders (1988) points out, if a relation of zero derivation holds between two words, it is necessary to determine which word is derived from the other, and to avoid vicious circularity, it is necessary to seek objective grounds for the indentification of zero derivations. In some instances, different scholars make mutually incompatible claims about their derivational analysis. For example, Quirk and Greenbaum (1973, p. 441) assert that the noun *cover* is derived by zero derivation from the verb *cover*, whereas Clark and Clark (1979, p. 770) consider the verb to be derived from the noun. Similarly, Clark and Clark (1979, p. 776) assert that the verb *shampoo* is derived from the noun, while Marchand (1969, p. 303) maintains that the noun is derived from the verb (cf. Sanders 1988). In most cases, however, it is usually clear which of the pair of lexemes related by zero derivation is simple and which is complex in terms of the general patterns of derivation manifest in the language. The directionality of zero derivation is beyond the scope of this paper. For detailed discussion, I refer the reader to Sanders (1988), Marchand (1969) and Adams (1973) among others.

stress patterns that occur in zero derivation can be directly handled in terms of some violable, ranked constraints. To this end, I assume that a single constraint can be multiply instantiated in a constraint hierarchy, and each instantiation may be indexed to apply to a particular set of lexical items (cf. Fukuzawa, 1999; Ito & Mester, 1999, 2001; Kraska-Szelenk, 1997, 1999; Pater, 2000). Specifically, I claim that there are two different versions of the markedness constraint which regulates stress assignment in English words: one is the lexically indexed markedness constraint WORD STRESS$_L$ and the other is the general markedness constraint WORD STRESS. The indexed version of the constraint ranks above the faithfulness constraint Base-Identity, which in turn outranks the general version of it. With the constraint ranking, I argue, all the stress patterns that occur in zero derivation receives an absolutely direct treatment.

This paper is organized as follows: briefly reviewing Kiparsky's (1982) analysis of zero derivation, section 2 shows that his analysis is untenable for several critical flaws. Then section 3 provides a constraint-based account of zero derivation and argues that it can be accounted for straightforwardly by using some violable, ranked constraints. Finally, section 4 summarizes the paper.

2. Kiparsky (1982)

In this section, based on a variety of evidence, I argue against Kiparsky's (1982) analysis of zero derivation which employs the framework of lexical phonology and morphology. In English, when nouns are derived from verbs by zero derivation, they may shift to the nominal stress pattern as in (1).[3]

(1) torménty → tórmentN protésty → prótestN
digésty → dígestN progrésss → prógressN

3) In Kiparsky (1982), the deverbal nouns in (1) are marked as having a secondary stress on the second syllable, which is not considered in this paper.

survéy$_V$ → súrvey$_N$ convíct$_V$ → cónvict$_N$
compóund$_V$ → cómpound$_N$

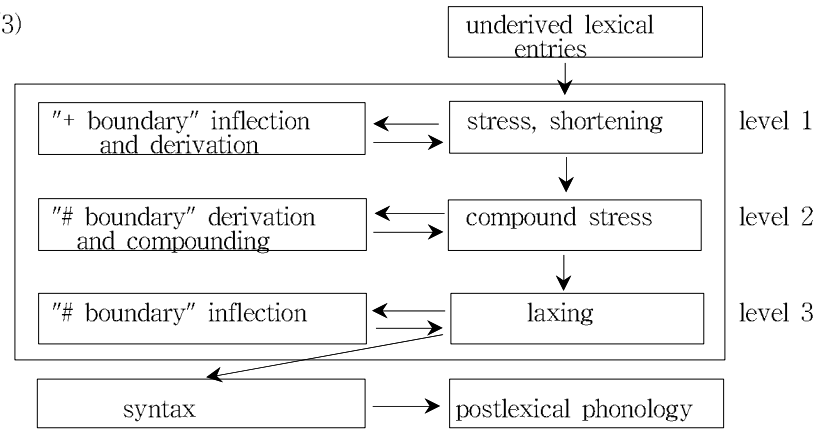
Note that in English disyllabic nouns and verbs, a word stress rule places the main stress on the second syllable of a verb, but on the first syllable of a noun (cf. Hayes, 1982). Unlike the deverbal nouns in (1), however, the denominal verbs which are zero-derived from nouns do not shift to the verbal stress pattern, as exemplified in (2).

(2)

páttern$_N$ → páttern$_V$	clímax$_N$ → clímax$_V$
dócument$_N$ → dócument$_V$	trímax$_N$ → trímax$_V$
tángo$_N$ → tángo$_V$	cómpliment$_N$ → cómpliment$_V$
hérald$_N$ → hérald$_V$	shádow$_N$ → shádow$_V$
díscipline$_N$ → díscipline$_V$	búrrow$_N$ → búrrow$_V$
bálance$_N$ → bálance$_V$	expériment$_N$ → expériment$_V$
píllow$_N$ → píllow$_V$	mónkey$_N$ → mónkey$_V$
cóntact$_N$ → cóntact$_V$	tútor$_N$ → tútor$_V$
cénsor$_N$ → cénsor$_V$	sórrow$_N$ → sórrow$_V$
pátent$_N$ → pátent$_V$	léver$_N$ → léver$_V$
ádvocate$_N$ → ádvocate$_V$	

Kiparsky (1982) claims that the difference in stress behavior between deverbal nouns and denominal verbs can be straightforwardly accounted for by using the framework of lexical phonology and morphology. According to him, the English lexicon is organized as in (3). Assuming that the rules of word stress applies at level 1 but not at level 2, Kiparsky asserts that the zero derivation of verbs into nouns undergoes the rules of word stress because it takes place at level 1, while the zero derivation of nouns into verbs is not subject to them since it occurs at level 2. For example, *survéy*$_V$ becomes *súrvey*$_N$ at level 1, where the word stress rules apply. In contrast, *clímax*$_V$ is derived from *clímax*$_N$ at level 2, where it escapes level 1 rules of word stress; hence, no stress shift.

(3)



Kiparsky (1982) further claims that by assigning V → N and N → V zero derivation to level 1 and 2 respectively, it is possible to account for why deverbal nouns can receive level 1 suffixes as in (4a), whereas denominal verbs cannot, as in (4b).

(4) a. contractual, murderous
b. *gesturation, *figurive, *patternance, *crusadatory, *cementant

Level 2 deverbal suffixes, however, can attach to zero-derived denominal verbs, as exemplified below:

(5) placement, commissionable, riveter, masquerading

According to Kiparsky, a special case of this relation between level 1 and level 2 derivation is that V → N → V zero derivation is possible, while N → V → N zero derivation is not, as illustrated in (6a) and (6b) respectively.

(6) a. protést$_V$ → prótest$_N$ → prótest$_V$ 'stage a prótest'
discóunt$_V$ → díscount$_N$ → díscount$_V$ 'sell at a discount'
digést$_V$ → dígest$_N$ → dígest$_V$ 'make a digest'

compóund$_V$ → cómpound$_N$ → cómpound$_V$ 'join or become joined in a compound'

b. páttern$_N$ → páttern$_V$ → *páttern$_N$

Kiparsky's analysis, however, is problematic in the following respects. First, Kiparsky argues that in the case of deverbal nouns in (1), stress shift occurs because the nouns are derived from the corresponding verbs at level 1 where the stress rules apply. For example, *torment*$_V$ is converted into *tórment*$_N$, which is in turn assigned verbal stress. He further maintains that the denominal verbs in (2) are exempt from the stress rules because they are derived at level 2, where the stress rules no longer hold good. There are, however, crucial counterexamples to Kiparsky's claim that V → N zero derivation triggers stress shift. Marchand (1969) points out that although we find stress shifting pattern in the derivation of deverbal nouns, this pattern is weaker than the homologic pattern which retains the stress of the base in the derivative. For instance, consider the following examples from Marchand (1969), Adams (1973) and Myers (1984):

(7)

accórd$_V$ → accórd$_N$	accóunt$_V$ → accóunt$_N$
appróach$_V$ → appróach$_N$	assént$_V$ → assént$_N$
advánce$_V$ → advánce$_N$	attáck$_V$ → attáck$_N$
concérn$_V$ → concérn$_N$	amóunt$_V$ → amóunt$_N$
deféat$_V$ → deféat$_N$	attémpt$_V$ → attémpt$_N$
decáy$_V$ → decáy$_N$	cemént$_V$ → cemént$_N$
dispúte$_V$ → dispúte$_N$	presérve$_V$ → presérve$_N$
disgúise$_V$ → disgúise$_N$	reléase$_V$ → reléase$_N$
patról$_V$ → patról$_N$	suppórt$_V$ → suppórt$_N$
commánd$_V$ → commánd$_N$	retréat$_V$ → retréat$_N$
accláim$_V$ → accláim$_N$	emplóy$_V$ → emplóy$_N$
desíre$_V$ → desíre$_N$	resólve$_V$ → resólve$_N$
dislíke$_V$ → dislíke$_N$	collápse$_V$ → collápse$_N$
disgúst$_V$ → disgúst$_N$	surpríse$_V$ → surpríse$_N$
dismáy$_V$ → dismáy$_N$	arrést$_V$ → arrést$_N$

rebúff$_V$ → rebúff$_N$	awárd$_V$ → awárd$_N$
repríeve$_V$ → repríeve$_N$	améndv → améndN

In (7), there are independent phonological reasons for analyzing the verbs as basic and the nouns as the derived forms. For example, note that both the verbs and the nouns in (7) have the identical verbal stress pattern, which can be straightforwardly accounted for if we assume that the verbs are first assigned the verbal stress at level 1, and then they are converted into the nouns at level 2. If the nouns rather than the verbs were taken as basic, however, it would be impossible to correctly predict the stress pattern in (7). Of interest here is that, although the nouns are derived from their corresponding verbs, no stress shift occurs, contrary to Kiparsky's assertion. If the V → N zero derivation applied at level 1 as Kiparsky argues, it would affect stress.[4] However, this is not the case in (7). As Myers (1984) points out, since the list of examples of the pattern in (7) can be continued indefinitely, it is undesirable to simply consider the examples in (7) as exceptions.

Second, Kiparsky's analysis lacks predictability. According to Marchand (1969, p. 378), the current tendency in zero derivation is to retain the stress of the base in deverbal nouns as well as in denominal verbs.[5] It is shown in (8) that new zero-derived words invariably share the stress pattern of the words from which they are derived, regardless of the directionality of zero derivation.

(8) a. xérox$_N$ → xérox$_V$ télex$_N$ → télex$_V$ nápalm$_N$ → nápalm$_V$
b. commúte$_V$ → commúte$_N$

The tendency to retain the stress pattern in zero derivation cannot be predictable under Kiparsky's analysis.

---

4) According to Hayes (1982), the (noncompound) stress rules, which apply at level 1, assign different stress patterns to nouns and verbs, since nouns have final syllable extrametricality but verbs do not.

5) Marchand (1969) calls this homologic stressing.

Finally, as Kang (1996) points out, if V → N zero derivation applied at level 1, then we would expect words like **respectal* (i.e., [[[respect]$_V$ ø]$_N$ al]$_A$) and **exhausatal* (i.e., [[[exhaust]$_V$ ø]$_N$ al]$_A$). However, these are not possible words.

3. A Constraint-based Analysis

So far it has been shown that Kiparsky's analysis couched within the framework of lexical phonology and morphology cannot provide a satisfactory account of the alternations in stress patterns that occur in zero derivation. In this section, I will begin with comprehensive data related with zero derivation, including those mentioned in section 2, and show that retaining the stress pattern of the base is paramount in zero derivation, while stress shift occurs only in a restricted set of disyllabic deverbal nouns. Then, I show that the stress patterns observed in zero derivation can be captured straightforwardly in OT. To this end, I assume that a single constraint can be multiply instantiated in a constraint hierarchy, and each instantiation may be indexed to apply to a particular set of lexical items (cf. Fukuzawa, 1999; Ito & Mester, 1999, 2001; Kraska-Szelenk, 1997, 1999; Pater, 2000). Given the assumptions, both the general and exceptional stress patterns found in zero derivation can be directly accounted for in terms of the interaction of faithfulness constraints with lexically indexed markedness constraints.

To begin with, let us consider cases where no stress shift occurs. As discussed in the preceding section, no stress shift occurs in the majority of disyllabic words derived by zero derivation, regardless of the directionality of derivation. For the sake of exposition, some of the relevant data in (2) and (7) above are repeated here as (9a) and (9b) respectively.

(9) a. páttern$_N$ → páttern$_V$ clímax$_N$ → clímax$_V$
dócument$_N$ → dócument$_V$ trímax$_N$ → trímax$_V$
b. accórd$_V$ → accórd$_N$ accóunt$_V$ → accóunt$_N$
appróach$_V$ → appróach$_N$ assént$_V$ → assént$_N$

The verbs are derived from the corresponding nouns in (9a), while the nouns are derived from the verbs in (9b). In both cases, however, the stress pattern of the base is retained in the derivative. This is also the case with all kinds of stress patterns. Compare (10) with (9a).

(10)[6] campáign$_N$ → campáign$_V$ canóe$_N$ → canóe$_V$
cartóon$_N$ → cartóon$_V$ cascáde$_N$ → cascáde$_V$
cemént$_N$ → cemént$_V$ crusáde$_N$ → crusáde$_V$
harpóon$_N$ → harpóon$_V$ lampóon$_N$ → lampóon$_V$

Both (9a) and (10) are cases of N → V zero derivation. Note, however, that they differ in the stress pattern of their base: the stress is on the first syllable in (9a), but on the second syllable in (10). Of importance here is that the different stress patterns of the base are retained in the derivative.

Preservation of the underlying stress pattern is not confined to disyllabic words. Polysyllabic words are also subject to the same principle. According to Marchand (1969), for example, although the polysyllabic words in (11) undergo N → V zero derivation, their stress pattern does not change, either:[7]

(11) chrónicle, commíssion, cómplement, condítion, díscipline
dócument, dýnamite, évidence, expériment, inconvénience
proposítion, régister

Verbs are also derived by zero derivation from adjectives (12a), interjections (12b) and adverbs (12c) although they are few in number compared with those from nouns. As is naturally expected, all the pairs are not differentiated by stress.[8]

---

6) The data in (10) are taken from Marchand (1969). Marchand (1969) says that as the number of endstressed nouns in English is much smaller than that of non-endstressed ones, there are correspondingly fewer verbs.

7) With polysyllabic *-ment* words the only difference between noun and verb is that the vowel of *-ment* is [ə] in the noun while it is [ɛ] in the verb (cf. Marchand, 1969).

(12) a. méllow, dírty, bétter, húmble, búsy, réady, sóber, émpty
wéary, nárrow, brázen, sávage, géntle, jólly, lével
b. éncore, hurráh
c. fúrther

In addition, verbs derived by zero derivation from composite nouns do not change their stress pattern. To take some examples, the words in (13) are stressed on the first syllable like their underlying nominal base (cf. Marchard, 1969).

(13) áfterdate, báckground, báckwash, bý-pass, cóunter-weight
óutlaw, óutline, únderstudy, úpgrade

Finally, as already mentioned, the current tendency is to retain the stress pattern of the base in deverbal nouns as well as in denominal verbs. That is, new zero-derived words do not change the stress pattern of the base regardless of whether a noun is derived from a verb or the other way round, as shown in words like *xérox*$_N$ → *xérox*$_V$, *télex*$_N$ → *télex*$_V$, *nápalm*$_N$ → *nápalm*$_V$, *commúte*$_V$ → *commúte*$_N$ in (8) above.

The generalizations about zero derivation outlined above, however, are upset by a small set of words. In the case of the deverbal nouns in (1), repeated here as (14), that is, zero derivation is accompanied by stress shift.

(14) torménť$_V$ → tórment$_N$ protéšt$_V$ → prótest$_N$
digéšt$_V$ → dígest$_N$ progréšš$_V$ → prógress$_N$
survéy$_V$ → súrvey$_N$ convíct$_V$ → cónvict$_N$
compóund$_V$ → cómpound$_N$

However, it is worth noting that stress shift occurs only in the nominals derived from a restricted set of verbs. Marchand (1969) says

8) There are also monosyllabic verbs derived by zero derivation from adjectives (e.g., *bald*, *pale*.), interjections (e.g., *shoo*), which are not considered in this paper (cf. Adams, 1973).

that, to a certain extent, the stress shift applies to verbs of French and/or Latin origin which are monemes in English, but are etymologically analysable as 'prefix + verb' in Latin or French. The pattern in (14), furthermore, does not enjoy productivity, unlike that in (7). Myers (1984) argues that (15) gives all the words of that type that he has found.[9]

(15) absent, abstract, affix, augment, compound, compress, concert
conduct, confine, conflict, conscript, consort, contest, contract
convert, convict, digest, escort, export, extract, ferment, import
impress, increase, insult, object, permit, pervert, present
produce, progress, project, protest, rebel, record, regress
subject, suffix, survey, torment, transfer, transport

Allen (1978) suggests that the placement of primary stress to the left in such cases might be equated with the placement of primary stress in compounds, which occurs only in nominal forms. That is, the stress shift in (14) is an exception that should be "noted in the lexicon."

We are now ready to tackle zero derivation in OT. To begin with, the observations made above lead us to the generalization that zero derivation requires a derivative to be faithful to the base. In the majority of cases, that is, the zero-derived forms retain the stress pattern of the base, while stress shift occurs only in a limited set of words. The facts can be straightforwardly captured in OT in terms of lexically indexed markedness and faithfulness constraints. Let us first consider how the general case of zero derivation without stress shift can be handled. In this case, we need a faithfulness constraint that requires identity between the base and the derivative.

---

9) Some additional words may be added to the list. Adams (1973), for example, considers the nouns *reject*, *import*, *suspect*, *refill* to be derived by zero derivation from the corresponding verbs. According to Rardin (1975) and Kiparsky (1982), in addition, words like *contrast*, *combat*, *construct*, *secret*, *defect* and *exploit* also undergo V → N zero derivation. Note, however, that addition of these words does not change the main point.

(16) Base-Identity: Given an input structure [X Y], output candidates are evaluated for how well they match [X] and [Y] if the latter occur as independent words (Kenstowicz, 1995).

The constraint Base-Identity militates against discrepancy between the base and the derived word. In the case at hand, the stress pattern in the base should be retained in the derivative in order to satisfy the constraint; otherwise the constraint will be violated. We also need a constraint regulating stress assignment. In English, all lexical words are required by a well-formedness condition to bear stress. English has a very complicated stress system, and a complete analysis of it is beyond the scope of this paper (See Chomsky & Halle (1968), Hayes (1982) and Pater (1995) for comprehensive references and discussion). For the present purpose, however, the following tentative constraint will suffice:

(17) WORD STRESS: In disyllabic nouns and verbs, the main stress is placed on the first syllable of a noun, but on the second syllable of a verb.

The two constraints above are in conflict with each other: Base-Identity requires the stress pattern of the base to be retained in the derived form, whereas WORD STRESS may produce different stress patterns depending on verbs and nouns. The following tableaux, for example, illustrate how the ranking Base-Identity ≫ WORD STRESS produces correct outputs in zero derivation, regardless of the directionality of zero derivation.

(18) $\text{páttern}_{N} \rightarrow \text{páttern}_{V}$

páttern_{N}	Base-Identity	WORD STRESS
a. pattérn_{V}	*!	
☞ b. páttern_{V}		*

(19) campáign$_N$ → campáign$_V$

campáign$_N$	Base-Identity	WORD STRESS
a. cámpaign$_V$	*!	*
☞ b. campáign$_V$		

(20) accórd$_V$ → accórd$_N$

accórd$_V$	Base-Identity	WORD STRESS
a. áccord$_N$	*!	
☞ b. accórd$_N$		*

In both (18) and (19), N → V zero derivation occurs. They differ only in where the base is stressed: the first syllable bears stress in (18), whereas the second syllable does in (19). In both cases, however, the second candidates, which are faithful to the stress pattern of the base, are selected as the optimal outputs because their contenders fatally violate the high-ranking Base-Identity due to stress shift. It is clear from the tableaux that it is important to retain the stress pattern of the base regardless of which syllable of the base is stressed. In other words, the preservation of the underlying stress pattern has priority over the observation of WORD STRESS. This is also the case with V → N zero derivation, as illustrated in (20). In (20a), stress shift occurs, causing a fatal violation of Base-Identity. Despite a violation of WORD STRESS, (20b) emerges as optimal because it retains the stress pattern of the base, satisfying the high-ranking Base-Identity.

Turning now to the case of stress shift in zero derivation, recall from the discussion in the preceding section that stress shift occurs only in a restricted set of words. The relevant data in (14) are repeated here as (21):

(21) torménT$_V$ → tórment$_N$ protéST$_V$ → prótest$_N$
digéST$_V$ → dígest$_N$ progréSS$_V$ → prógress$_N$
survéy$_V$ → súrvey$_N$ convíct$_V$ → cónvict$_N$
compóund$_V$ → cómpound$_N$

As discussed above, stress shift occurs only in the nominals derived from a restricted set of verbs of French and/or Latin origin which are monemes in English, but are etymologically analysable as 'prefix + verb' in Latin or French. Besides, the pattern does not enjoy productivity. Given the facts, I claim that the stress shift in (21) is an exception that should be "noted in the lexicon." In what follows, I will show that the exceptional stress shift in zero derivation can be accounted for straightforwardly if markedness constraints can be lexically indexed (cf. Pater, 2000). I assume that a single constraint can be multiply instantiated in a constraint hierarchy, and each instantiation may be indexed to apply to a particular set of lexical items (cf. Fukuzawa, 1999; Ito & Mester, 1999, 2001; Kraska-Szelenk, 1997, 1999; Pater, 2000). Specifically, I claim that there are two different versions of WORD STRESS: WORD STRESS which generally applies to words, and WORD STRESS$_L$ which applies only to those lexical items indexed for its application (here with an 'L' for 'lexical'). The indexed version of the constraint ranks above Base-Identity, while the general version of it ranks beneath the faithfulness constraint. The exceptional items are targeted by WORD STRESS$_L$.

(22) Grammar: WORD STRESS$_L$ ≫ Base-Identity ≫ WORD STRESS
Lexicon: torment$_L$ protest$_L$ survey$_L$ accord pattern approach

Tableaux (23) and (24) show the results of applying this grammar to a form that bears the index (*survey*$_L$), and one that lacks it (*approch*), respectively.

(23) survéy$_V$ → súrvey$_N$

survéy$_L$	WORD STRESS$_L$	Base-Identity	WORD STRESS
a. survéy$_N$	*!		*
☞ b. súrvey$_N$		*	

(24) appróach$_V$ → appróach$_N$

appróach	WORD STRESS$_L$	Base-Identity	WORD STRESS
a. ápproach$_N$		*!	
☞ b. appróach$_N$			*

In (23), the word *survey* is subject to the lexically indexed version of WORD STRESS$_L$, so candidate (a) which violates the top-ranked lexically indexed constraint loses to its contender (b). In (24), on the other hand, the constraint WORD STRESS$_L$ is irrelevant, since the word *approach* is not lexically indexed with the constraint. In this case, the faithfulness constraint Base-Identity plays a crucial role in determining the optimal output, choosing candidate (b) which is faithful to the base.

So far it has been shown that the stress patterns in zero derivation can be directly accounted for by utilizing some ranked, violable constraints. As discussed above, regardless of the directionality of zero derivation, the derivative is generally required by the faithfulness constraint Base-Identity to retain the stress pattern of the base. In the case of a few exceptional words, on the other hand, stress shift occurs in order to satisfy the high ranking WORD STRESS$_L$, which demands lexically indexed words to be stressed according to the principles of stress assignment.

The analysis argued for in this paper is preferred over Kiparsky (1982) in several respects. First, as discussed above, there exist cases of V → N zero derivation which are not accompanied by stress shift. This constitutes apparent counterexamples to Kiparsky's argument that V → N zero derivation causes stress shift because it occurs at level 1, while N → V zero derviation does not since it applies at level 2. It has been shown that without recourse to the notion of 'level', the present analysis can provide a direct account of zero derivation with stress shift as well as without stress shift. Second, the fact that new zero-derived words always retain the stress pattern of the base cannot be predictable by Kiparsky (1982). Under the present analysis, however, the prediction is borne out by ranking the faithfulness constraint Base-Identity over WORD STRESS. That is, when a new word is zero-derived, it is required

to retain the stress pattern of the base to satisfy the high ranking faithfulness constraint Base-Identity.

The assertion that forms derived by zero derivation are faithful to their base receives further support from another source, namely the treatment of irregular verb inflection. For example, verbs ending in *-ing* or *-ink* are strong verbs and form their past tense by ablaut (Katamba, 1993). That is, the stem vowel is changed from /ɪ/ to /æ/, as shown below:

(25)	Present tense	Past tense
	sink	sank
	stink	stank
	sing	sang
	ring	rang

Verbs which are derived by zero derivation from nouns, however, do not undergo ablaut in the past tense although they have the *-ink* or *-ing* phonological shape. Instead, their past tense is formed by using the *-ed* past tense suffix, as illustrated in (26).

(26)	Noun	→	Verb	→	Past tense
	link		link		linked (*lank)
	ring		ring		ringed (*rang)

Why is the *-ed* past tense suffix used instead of the /ɪ/ → /æ/ ablaut in order to form the past tense of denominal verbs ending in *-ing* or *-ink*? The answer is straightforward: the denominal verbs should be faithful to their base. Ablaut applies only to a restricted set of strong verbs, while the past tense of verb is usually formed by attaching the *-ed* past tense suffix to the stem. The difference between strong verbs and denominal verbs also can be accounted for by invoking the notion of "lexically indexed constraint". For expository ease, I will adopt the straightforward but stipulative PAST for regular past tense and PAST_L for ablaut as the active constraints. The constraint PAST_L is indexed to

the strong verbs. The lexically indexed version of the constraint outranks both the general version of it and the faithfulness constraint Base-Identity, which do not conflict with each other. The following tableaux, for example, show how the three constraints conspire to produce correct outputs in both regular and strong verbs:

(27) ring → rang

ring$_L$	PAST$_L$	Base-Identity	PAST
a. ringed	*!		
☞ b. rang		*	*

(28) ring → ringed

ring	PAST$_L$	Base-Identity	PAST
☞ a. ringed			
b. rang		*!	*

In (27), *ring*$_L$ is a strong verb, hence it is subject to the lexically indexed constraint PAST$_L$. The first candidate violates the constraint because the /-ed/ past tense suffix is attached to the stem. In spite of its violations of both Base-Identity and PAST, the second candidate carries the day due to its satisfaction of the top-ranked constraint PAST$_L$. In (28), on the other hand, PAST$_L$ is irrelevant because the denominal verb *ring* is not indexed to the constraint. Instead, the other constraints down the hierarchy determine the optimal output. While candidate (b) violates both Base-Identity and PAST, candidate (a) obeys them, emerging as optimal. It is clear from the tableaux above that zero-derived forms are faithful to the base and divergence from the base can be allowed only in a limited case. I view the forms in (26) as providing supporting evidence for the analysis of this paper.

4. Conclusion

In this paper, I have shown that a constraint-based approach can account for zero derivation in English in a straightforward way.

Pointing out several empirical shortcomings of Kiparsky's analysis, I have argued for an account of stress patterns in zero derivation based both on prosodic faithfulness and on lexical indexation of constraints. Specifically claiming that there are two different versions of a markedness constraint regulating stress assignment in English words, i.e. WORD STRESS$_L$ and WORD STRESS, I have shown that, with WORD STRESS$_L$ ≫ Base-Identity ≫ WORD STRESS, all the stress patterns that occur in zero derivation receives an absolutely direct treatment. As for the productivity of zero derivation, in addition, I have asserted that the prediction that zero-derived forms retain the stress pattern of the base is borne out under the analysis of this paper: i.e., zero-derived forms should be faithful to the base to satisfy the faithfulness constraint Base-Identity, which outranks WORD STRESS.

References

Adams, V. (1973). *An Introduction to Modern English Word-Formation*. London: Longman Group Ltd.

Allen, M. (1978). *Morphological investigations*. Unpublished doctoral dissertation. University of Connecticut. Storrs, CT.

Chomsky, N. & Halle. M. (1968) *The Sound Pattern of English*. New York: Harpers and Row.

Clark, E. V. & Clark, H. H. (1979). When noun surfaces as verbs. *Language 55*, 767-811.

Fukuzawa, H. (1999). *Theoretical implications of OCP effects on features in Optimality Theory*. Unpublished doctoral dissertation. University of Maryland, College Park. ROA-307.

Hayes, B. (1982). Extrametricality and English stress. *Linguistic Inquiry* 13, 227-276.

Ito, J. & Mester, A. (1999). The phonological lexicon. In N. Tsujimura (ed.) *The Handbook of Japanese Linguistics* (pp. 62-100). Oxford: Blackwell.

Ito, J. & Mester, A. (2001). Covert generalizations in Optimality Theory:

the role of stratal faithfulness constraints. *Studies in Phonetics, Phonology, and Morphology 7*, 273-299.

Kang, S-K. (1996). Zero derivation and level-ordered morphology. *Eoneo*, 17, 77-92.

Katamba, F. (1993). *Morphology*. London: Macmillan Press Ltd.

Kenstowicz, M. (1995). Base-identity and uniform exponence: Alternatives to Cyclicity. ROA 103.

Kiparsky, P. (1982). Lexical morphology and phonology. In Linguistic Society of Korea (ed.), *Linguistics in the Morning Calm 1: Selected Papers from SICOL 1981* (pp. 3-91). Seoul: Hanshin.

Kraska-Szelenk, I. (1997). Exceptions in phonological theory. *Proceedings of the 16th International Congress of Linguists*. Paper No. 0173. Oxford: Pergamon.

Kraska-Szelenk, I. (1999). Syllable structure constraints in exceptions. In J. Rennison & K. Kühnhammer (eds.) *Phonologica 1996: Syllables !?* (pp. 113-131). The Hague: Thesus.

Lyons, J. (1977). *Semantics*. Cambridge: Cambridge University Press.

Marchand, H. (1969). T*he Categories and Types of Present-Day English Word-Formation* (2nd edition). Munich: Verlag C. H. Beck.

McCarthy, J. & Prince, A. (1995). Faithfulness and reduplicative identity. In J. Beckman, L. W. Dickey & S. Urbanczyk (eds.), *University of Massachusetts Occasional Papers 18: Papers in Optimality Theory* (pp. 249-384). Amherst, MA.

Myers, S. (1984). Zero-derivation and inflection. *MIT Working Papers in Linguistics 7: Papers from the January 1984 MIT Workshop in Morphology,* 53-69. MITWPL, Department of Linguistics and Philosophy, MIT, Cambridge, Mass.

Pater, J. (1995). On the nonuniformity of weight-to-stress and stress preservation effects in English. Unpublished manuscript. ROA-107.

Pater, J. (2000). Nonuniformity in English stress: the role of ranked and lexically specific constraints. *Phonology 17*, 237-274.

Prince, A. & Smolensky, P. (1993). *Optimality theory: constraint interaction in generative grammar*. Unpublished manuscript.

Quirk, R. & Greenbaum, S. (1973). *A Concise Grammar of Contemporary English*. New York: Harcourt.

Rardin, R. B. (1975). *Studies in derivational morphology*. Unpublished doctoral dissertation. MIT. Boston, MA.

Sanders, G. (1988). Zero derivation and the overt analogue criterion. In M. Hammond & M. Noon (eds.), *Theoretical Morphology: Approaches in Modern Linguistics* (pp. 155-178). San Diego, California: Academic Press, Inc.

Seok-keun Kang
English Department
Wonkwang University
344-2 Shiyong-dong
Iksan, Jeonbuk 570-749
Korea
Phone: 82-63-850-6914
Email: skkang@wonkwang.ac.kr

Received: 30 September, 2007
Revised: 26 November, 2007
Accepted: 4 December, 2007