

ALLEN'S DEFENCE OF THE EXTENDED ORDERING HYPOTHESIS:
A CRITICAL APPRAISAL

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1 Introduction

This appraisal is directed at Allen's (1978) Extended Ordering Hypothesis (henceforth "EOH"),¹⁾ which represents an "extension" of Siegel's (1974) Ordering Hypothesis. The latter hypothesis is formulated as follows by Siegel (1974:152):

(1) ORDERING HYPOTHESIS

- A. In English, Class I affixation precedes Class II affixation.
- B. The cyclic stress assignment rules follow Class I affixation and precede Class II affixation.

According to Siegel (1974:148), Class I affixes are introduced with a +boundary, whereas Class II affixes are introduced with a #boundary. The association of different boundaries with the two classes of affixes captures the insight that Class I affixes are stress-determining, whereas Class II affixes are stress-neutral.

The EOH, as formulated by Allen (1978:83), reads as follows:

(2) EOH

Compound formation follows all rules of affixation, and the assignment of external word-boundaries to lexical items is ordered after affixation rules but before compounding.²⁾

Allen (1978:7) argues for a level-ordered morphology. In such a morphology different types of word formation rules are ordered with respect to each other. Individual rules of the same type, however, are not ordered with respect to each other. A morphological theory which incorporates the hypotheses (1) and (2) expresses, among other things, the following two ordering claims:

- (3) a. All Level II or #boundary affixation rules are ordered after all Level I or +boundary affixation rules.
- b. All Level III rules, which include the rules of compounding, are ordered after both Level I and Level II affixation rules.

On the basis of (3), it is predicted that

- (i) no +boundary affix will appear outside a #boundary affix or a compound;
- (ii) no affix will appear outside a compound.³⁾

The primary aim of this paper is to determine the correctness of the ordering claim expressed by the EOH, i.e. the correctness of the claim that no affixes may appear outside compounds. Allen (1978:232ff.) discusses various morphologically complex words of English in which, apparently, affixes appear outside compounds. The existence of such words poses a serious challenge to the EOH. However, she employs a number of strategies to protect the EOH from refutation by this apparent counterevidence. Her strategies for protecting the EOH will be analyzed critically.

Any attempt at empirical validation of a hypothesis such as the EOH must take account of the status which the hypothesis is supposed to have. In this regard the following question arises:

- (4) Did Allen intend the EOH to be a language-specific principle of English, or did she intend it to be a language-independent principle?

Allen does not explicitly characterize the status of her morphological theory as either language-specific or language-independent. She (1978:1) merely states that the aim of her thesis is

"to determine the nature of the principles of word formation, and to investigate their interaction with other grammatical phenomena".

Furthermore, she does not explicitly restrict the scope of her study to the morphology of English in particular. She repeatedly refers to "(the) morphology". Consider, for example, remarks such as the following:

"The generative capacity of *the morphology* is decreased by including the Strong Boundary Condition and the Extended Ordering Hypothesis as part of the theoretical machinery."⁴)

[Abstract]

"... there are three levels in *the morphology* at which rules of word formation operate."

[p. 186]

"The Extended Ordering Hypothesis is a *general ordering principle of morphology* which drastically limits the number of possible combinations of prefixes and suffixes."

[p. 196]

"The *theory of morphology* for which I have argued ..."

[p. 214]

There appears to be no reason to believe that Allen did not intend her general theoretical claims to have the status of language-independent principles. Matters are complicated, however, by the fact that Allen

(1978:6) accepts Siegel's (1974) Ordering Hypothesis which is explicitly formulated for English only. Thus consider the following remark by Siegel (1974:152):

*"In English, Class I affixation precedes Class II affixation."*⁵⁾

Although Allen makes no explicit statement to this effect, her acceptance of Siegel's Ordering Hypothesis could be taken to indicate that she intended the EOH to be a principle of English morphology alone.

The ambiguity in the status of the EOH entails that the claim that affixes may not appear outside compounds has to be tested both as a language-specific claim and as a claim about language in general. This paper is concerned with the question whether the EOH is correct as a language-specific principle. In the thesis (T.C. Botha 1982) on which this paper is based, the status of the EOH as a language-independent principle is considered as well.

The remainder of this paper is organized as follows. In §2, the status of the EOH within the more general framework of Allen's theory of Overgenerating Morphology will be considered in some detail. The predictions of the EOH are presented in §3. §4 considers some putative counterexamples to the EOH, as well as Allen's attempts at defusing the threat which these examples pose to the EOH. Finally, in §5, I shall briefly look at other linguists' views on the question of whether compounds can form the basis of affixation in English. The main findings of the paper are summarized in §6.

2 The EOH within an Overgenerating Morphology

Before the predictions of the EOH are considered, it is necessary to consider the nature of the relationship between Allen's (1978:189) theory of Overgenerating Morphology and her EOH.

According to Allen (1978:189), all word formation rules, including the compound formation rules, apply to bases which are either (i) underived or (ii) potential well-formed outputs of word formation rules. Whether these potential words are also occurring words is not relevant at all. Allen thus regards rules of word formation as overgenerating rules. According to her (1978:195),

"Over-generating word-formation rules apply whenever the structural conditions of their application are met, and can be blocked only by general, independently motivated principles."

Allen (1978:189) uses the term Overgenerating Morphology to refer to this "model of the workings of morphological rules", as she phrases it.⁶⁾

Because Allen (1978:185) assumes an Overgenerating Morphology, she has to account for the fact that the word formation rules generate an infinite set of possible, well-formed words, only some of which are actual or occurring words in the language. In order to do this, she distinguishes between the Conditional Lexicon and the Permanent Lexicon. According to her (1978:189),

"... the set of potential well-formed outputs of WFRs [i.e. word formation rules --- T.C.B.] and CFRs [i.e. compound formation rules --- T.C.B.], an infinite set, will be referred to as the Conditional Lexicon, and the list of exceptional words as the Permanent Lexicon."

Allen (1978:196) regards the EOH as one of a set of general, independently motivated principles of morphology which restrict the ways in which word formation rules may interact.⁷⁾ She (1978:196) formulates this view as follows:

"The Extended Ordering Hypothesis is a general ordering principle of morphology which drastically limits the number of possible combinations of prefixes and suffixes."

According to Allen (1978:212), some interaction between an Overgenerating Morphology and the EOH is inevitable, since they are both principles of morphology which govern the application of word formation rules. Furthermore, she (1978:212) rejects the claim that the EOH can be maintained only in conjunction with an Overgenerating Morphology in certain cases. As Allen (1978:212) points out, both hypotheses are motivated on the basis of independent sets of data. For example, the fact that there are well-formed words in *-ing* and *-ed* which form the bases of other word formation rules, but which do not occur as independent words, provides evidence for postulating an Overgenerating Morphology. These facts, however, have nothing to do with the EOH. On the other hand, the fact that word-boundary affixes do not appear outside compounds, constitutes crucial evidence for the EOH, but is independent of an Overgenerating Morphology.

Allen (1978:212-213) illustrates the nature of the interaction between an Overgenerating Morphology and the EOH with reference to the forms *hunch-backed*, *pale-faced* and *dim-witted*. According to her, the bracketings in (5)(a) violate the EOH, since a Level II suffix, *#ed*, is bracketed outside a compound, which is formed at Level III.⁸⁾ By contrast, the bracketings in (5)(b) do not violate the EOH in any way. However, the bracketings in (5)(b) can only be assigned within an Overgenerating Morphology. The forms [*backed*], [*faced*] and [*witted*] are not "independently occurring words" in English.

(5) (a) [*hunch-back*] *ed*
 [*pale-face*] *ed*
 [*dim-wit*] *ed*

(b) [*hunch*] [*backed*]
 [*pale*] [*faced*]
 [*dim*] [*witted*]

According to Allen (1978:213), there is ample evidence from the semantics and stress patterns of forms such as these in favour of a bracketing as in (5)(b). She (1978:213) thus concludes that

"The fact that these bracketed forms [i.e. the forms bracketed as in (5)(b) above --- T.C.B.] are also consistent with the Extended Ordering Hypothesis can only be construed as a positive result."⁹⁾

We can now return to Allen's (1978:186) claim that all Level III rules must be ordered after all Level I and Level II affixation rules. Recall that Allen (1978:186) regards compounding as a Level III process. In other words, her claim that all Level III rules must be ordered after all Level I and Level II rules amounts to the claim that no affixes can appear outside compounds. It is the correctness of this claim which I propose to challenge in this study.

Allen's distinction between affixation as Level I and II processes and compounding as a Level III process, is based on the assumption that the internal boundaries of forms derived by means of these processes differ. She (1978:125) presents two sources of evidence in support of this claim: (i) phonological evidence and (ii) morphological evidence.

(i) Phonological evidence

Allen (1978:121ff.) observes that there are a number of phonological distinctions which must be made at the internal boundary of compounds, i.e. [WORD] [WORD] forms, and words formed by means of #boundary suffixation, i.e. [WORD] [#SUF] forms. In order to account for these distinctions, she posits a distinction between two levels of word formation, viz. Level II for derivation and Level III for compounds. The phonological distinctions are the following:

a. the tense /i/ — /I/ alternation

There is an alternation between the tense final /i/ in free-standing words and the lax /I/ in corresponding derivatives, formed by means of #boundary suffixation. Compare, for example, the following forms:

(6)	<u>Underived word</u>	<u># suffix derived form</u>
	(tense /i/)	(lax /I/)
	<i>beauty</i>	<i>beautiful</i>

No such alternation exists in the case of free-standing words ending in

/i/ and corresponding compounds. The vowel in corresponding compounds behaves exactly like the vowel in the free-standing forms. Compare, for example, the forms in (7).

(7)	<u>Underived word</u>	<u>Compound</u>
	(tense /i/)	(tense /i/)
	<i>beauty</i>	<i>beauty-treatment</i>

According to Allen (1978:122), these facts indicate that the rule responsible for the tensing or laxing of the vowel in question is sensitive to a structural difference in the immediate righthand environment of the target vowel in derivatives derived by #boundary suffixation and compounds.

b. /l/ and /r/ syllabification

According to Allen (1978:122-123), syllabification of /l/ and /r/ occurs word-finally. In the case of corresponding forms derived by means of #boundary suffixation, however, /l/ and /r/ either do not syllabify, or they syllabify optionally. Furthermore, /l/ and /r/ always syllabify in compounds, even if followed by a vowel.

(8)	<u>Underived word</u>	<u>#suffix derived form</u>	<u>Compound</u>
	<i>angle</i>	<i>angling</i>	<i>angle-inch</i>
	[æŋgəl]	[æŋglɪŋ]	[æŋgəlɪnč]
	<i>wonder</i>	<i>wondering</i>	<i>wonder-ape</i>
	[wʌndər]	[wʌndrɪŋ/wʌndərɪŋ]	[wʌndəreɪp] *[wʌndreɪp]

Once again, Allen's (1978:123) conclusion is that the internal boundary structure of compounds must be distinguished from the internal boundary structure of #boundary suffix derivatives.

c. Fricative voicing

Allen (1978:124) points out that there is an alternation between voiceless and voiced fricatives in word-final position in some words and cor-

responding derivatives formed by means of # boundary suffixation. However, no such alternation exists in the case of the left-hand constituent of corresponding compounds. Compare (9), for example.

(9)	<u>Underived word</u>	<u># suffix derived form</u>	<u>Compound</u>
	(voiceless fricative)	(voiced fricative)	(voiceless fricative)
	<i>louse</i>	<i>lousy</i>	<i>louse-eaten</i>
	[<u>lows</u>]	[<u>lowziy</u>]	[<u>lowsitən</u>] * [<u>lowzitən</u>]

These examples show, once again, that the operation of certain phonological rules distinguishes between the internal boundary structure of compounds and the internal boundary structure of derivatives formed on the basis of # boundary suffixation.

On the strength of the evidence surveyed above, Allen (1978:125) concludes that the internal boundary in compounds differs from the internal boundary in derivatives formed by # boundary suffixation. She (1978:126) proposes the following morphological structures in order to capture this difference:

(10) Underived words

[# WORD#]

eg. [# *mercy* #]

Derivatives formed by Level II affixation rules

[# [WORD] [# SUFFIX] #]

eg. [# [*mercy*] [# *ful*] #]

Compounds formed by Level III rules

[# [# WORD#] [# WORD#] #]

eg. [# [# *mercy*] [# *killinq#*] #]

As Allen (1978:220) observes, these structures indicate that a "word"

functioning as a constituent of a Level II derived word has a different morphological status from a "word" functioning as a constituent of a compound.

(ii) Morphological evidence

The morphological evidence presented by Allen (1978:66) concerns the occurrence of negative prefixes in compound adjectives. According to Allen (1978:43), the prefix *un-* must be regarded as a Level II prefix associated with a # boundary. As such, *un-* should not be able to attach to compounds, which is indeed the case.

- (11) **un-college-educated*
**un-factory-built*
**un-fuel-injected*

The prefix *non-*, however, may attach to compound adjectives such as *college-educated*, *factory-built*, etc.:

- (12) *non-college-educated*
non-factory-built
non-fuel-injected

Allen (1978:73) thus concludes that the prefix *non-* is associated with a boundary stronger than #. The facts in (11) and (12) above can now be accounted for: *un-* is a # boundary prefix and, as a Level II rule, *un-* Prefixation precedes compounding; *non-* has a stronger boundary associated with it and therefore, *non-* Prefixation is considered a Level III rule. Being a Level III rule, *non-* Prefixation can apply to compounds, which are also formed by Level III rules.

According to Allen (1978:223), the phonological and morphological facts in (i) and (ii) above can only be explained within a morphological theory which includes the claim that Level III rules such as compounding rules must be ordered after all Level II affixation rules. Within Allen's (1978) morphological theory, the EOH constitutes such an ordering statement.

As an ordering hypothesis, the EOH makes a number of predictions about the appearance of affixes in certain morphological forms. These predictions, however, are not wholly unproblematic. One such problematic prediction is that no Level II affixes can appear outside compounds formed by Level III rules.¹⁰⁾ It was shown that Allen (1978:121ff.) holds that the internal boundary in compounds is different from the internal boundary in derivatives formed by # boundary affixation. Thus, if compounds contain a double internal word-boundary, it must be assumed that derivatives formed by # boundary affixation contain a single internal word-boundary. Allen (1978:217) therefore proposes that the following distinctions be made:

- (13) Words }
 Compounds } --- some # rules apply only here
 # Affix forms --- other # rules apply only here
 +Affix forms --- no # rules apply here¹¹⁾

On the basis of the same types of evidence, Selkirk (1978:22),¹²⁾ by contrast, claims that

"the segments preceding neutral [i.e. word-boundary --- T.C.B.] affixes behave as if they were word-final."¹³⁾

Therefore, Selkirk's word-boundary affixation rules do not distinguish between the word-final morphological environment on the one hand, and the morphological environment internal to compounds and derivatives formed by # boundary affixation on the other hand. According to Allen (1978:216), Selkirk proposes that the following distinctions be made:

- (14) Words }
 Compounds } --- # rules apply
 # Affix (Neutral) forms }
 +Affix (Non-neutral) forms --- # rules do not apply

Selkirk (1978) argues for a morphological theory which Allen (1978:186) refers to as a "non-ordering" theory.

Selkirk (1978:14) accepts the SPE distinction drawn between stress neutral and non-neutral affixes. Whereas neutral affixes are adjuncts to stems, non-neutral affixes are adjuncts to roots. She (1978:17) cites four fundamental properties which distinguish neutral affixes from non-neutral affixes in English. The property relevant to the present discussion is expressed by Selkirk's claim that, whereas neutral affixes can appear outside compounds, non-neutral affixes cannot. Given the distinction between stems and roots,¹⁴⁾ and the claim that neutral affixes attach to stems, whereas non-neutral affixes attach to roots, it is clear why Selkirk's morphological theory can be called a "non-ordering" theory. She does not need ordering claims to ensure that the neutral affixes always appear "outside" non-neutral affixes.¹⁵⁾

In support of her claim that neutral, or # boundary affixes can appear outside compounds, Selkirk (1978:21-22) presents some examples of morphologically complex words. Allen (1978:215) sees these examples as constituting a potential threat to the EOH and, hence, reanalyzes them to show that they are not real counterexamples to her own morphological theory.

3 Predictions of the EOH

Before we consider Allen's reanalyses of the apparent counterexamples to the EOH, the predictions of her morphological theory must be examined in more detail. A first prediction which follows from Allen's (1978) morphological theory and which, in fact, is a prediction of the Ordering Hypothesis, can be formulated as follows:

(15) No +boundary affixes can appear outside # boundary affixes.

The prediction (15) follows from the ordering claim of the Ordering Hypothesis, viz. that all Level II # boundary affixation rules are ordered after all Level I +boundary affixation rules. Allen does not explicitly present (15) as a prediction of the EOH. However, in her (1978:18ff.) discussion of the prefixes *un-* and *in-* she argues that the Level I prefix *in-* can only attach to other Level I derived words. In (16)(a) below, for example, *in-* cannot co-occur with the Level II suffixes *-ly*, *-y* and *-like*.¹⁶⁾ However, in the forms (16)(b), *in-* may attach to words

which are derived by the Level I suffixes *-ion*, *-ity* and *-ate*. Thus, *in-* Prefixation should be regarded as a Level I affixation rule.

- (16) (a) *friendly* --- **infriendly*
 lucky --- **inlucky*
 childlike --- **inchildlike*
- (b) *decision* --- *indecision*
 ability --- *inability*
 animate --- *inanimate*

By contrast, the suffix *un-* can attach to words derived by Level II affixation rules. Compare, for example, the forms in (17).

- (17) *unfriendly*
 unlucky
 unchildlike

At a first glance, there seems to be some justification for the prediction presented in (15). As Allen (1978:215) notes, this prediction is essentially equivalent to the proposals incorporated in Siegel's (1974:152) Ordering Hypothesis.

The second prediction of Allen's morphological theory is described by her (1978:215) as "not controversial". This prediction follows from the second ordering claim of the EOH, viz. that all Level III rules are ordered after all Level I and Level II affixation rules.

- (18) No Level I +boundary affixes can appear outside compounds, which are formed by Level III rules.

Allen (1978:215) notes that +boundary affixes do not appear outside compounds. They do, however, occur freely compound-internally. This is clear from the following examples presented by Allen (1978:215):

- (19) +Affix outside compound
 * [in [*fuel-injected*]]
 * [[*street - music*] al]

+Affix inside compound
 [[inhospitable] [*looking*]]
 [[musical] [*sounding*]]

Allen (1978:215ff.) deals with the third prediction of the EOH in far greater detail. This prediction follows from the ordering claim expressed by the EOH, viz. that all Level III rules are ordered after all Level I and Level II affixation rules.

- (20) No Level II #boundary affixes can appear outside compounds, which are formed by Level III rules.

It was shown in §2 above that Allen (1978:75, 121ff.) argues, on the basis of phonological and morphological evidence, that a formal distinction should be drawn between Level II and Level III morphological processes. However, as Allen (1978:215) notes,

"The relationship of Level III morphological processes, especially compounding, to Level II word-boundary affixation rules is more complex."

Allen's problem is that there appear to be cases in which Level II affixes occur outside compounds. In the presentation of her morphological theory, Selkirk (1978:21) cites examples in which #boundary affixes seem to appear outside compounds.¹⁷⁾ It is obvious that, if Selkirk's analysis should prove to be correct, such forms would constitute clear violations of the EOH. In an attempt to save the EOH, Allen (1978:215ff.) attempts to reanalyze the forms in question.

Of the various predictions made by Allen's morphological theory, the third one is both the most problematic and the most interesting. First, there are

several English words which apparently conflict with this prediction and which have to be dealt with individually by Allen. Secondly, the prediction does not seem to be borne out by data from languages other than English. In the rest of this paper, therefore, I will concentrate on the third prediction of Allen's morphological theory.

4 Allen's defence of the EOH

4.1 General

In addition to the apparent counterexamples presented by Selkirk (1978: 21), Allen (1978:224ff.) herself cites a number of forms which pose a threat to the EOH.¹⁸⁾ Before proceeding with a discussion of Allen's handling of specific apparent counterexamples to the EOH, let us first consider her reaction to the apparent counterexamples in general.

Botha (1981a:408-409) lists seven fundamental ways in which a scientist may react to criticism brought against a hypothesis or theory.¹⁹⁾ The choice of an appropriate form of reaction is co-determined by the scientist's judgment of the relevance and force of the criticism brought against his theory.

Some of the strategies used by Allen in defence of the EOH against the putative counterexamples represent the form of reaction called "protection" by Botha (1981a:413-417). "Protection", according to Botha (1981a: 409), entails that

"the scientist takes steps to protect H [i.e. a hypothesis --- T.C.B.] or T [i.e. a theory --- T.C.B.] from the criticism without eliminating its defect(s) in any direct way."

According to Botha (1981a:414), this type of reaction is aimed at retaining a criticized hypothesis by taking certain steps. These steps involve the formulation of auxiliary hypotheses which protect the defective hypothesis from the criticism. Auxiliary hypotheses are either ad hoc or non-ad hoc in nature,²⁰⁾ depending on whether the protective devices in terms of which the claims are made are objectionable or non-objectionable.

According to Botha (1978:3), "protective devices" may be characterized as

"concepts, conceptual distinctions, auxiliary hypotheses, methodological assumptions, etc. by means of which a hypothesis or theory may be made compatible with data that appear to conflict with one or more of the test implications of the hypothesis or theory."

Botha (1978:19) states that a protective device is conventionally considered to be objectionable if it can be used to make claims which have to be assigned the status of ad hoc auxiliary hypotheses. Conversely, a protective device is non-objectionable if it can be used to make claims that can be assigned the status of non-ad hoc auxiliary hypotheses.

As was claimed above, Allen's (1978) strategy for defending the EOH entails protecting it from refutation. The steps she takes, crucially do not involve any modifications to the hypothesis, but serve to render the criticized EOH consistent with the linguistic data that constitute the potential counterexamples. The question that has to be answered here, is whether Allen's strategy of protection is objectionable or non-objectionable. In order to do this, consideration will have to be given to the putative counterevidence in conjunction with the various protective devices which Allen (1978) employs.

Most of the putative counterexamples to the EOH which Allen (1978:224ff.) deals with come from (Selkirk 1978). Selkirk does not present them as counterexamples to the EOH, but Allen regards them as posing a threat to her hypothesis. The remaining putative counterexamples are mentioned by Allen herself. All the examples involve the occurrence of an affix, specifically a # boundary affix, outside a compound. As was previously shown, the ordering claim expressed by the EOH explicitly prohibits the attachment of a Level II, # boundary affix outside a compound.²¹⁾

The putative counterexamples to the EOH fall into two classes, viz. (i) words in which prefixes appear outside compounds, and (ii) words in which suffixes appear outside compounds. Examples of words in which prefixes occur outside compounds are the following:

- (21) *un-*
 [*un-* [*hen pecked*]]
 [*un-* [*God fearing*]]
- re-*
 [*re-* [*up grade*]]
 [*re-* [*air condition*]]²²⁾
- (22) *to re-air-condition*
to pre-air-condition
to pre-proof-read
to re-proof-read
re-type-write
re-tape-record
*pre-tape-record*²³⁾

Selkirk (1978:21) also presents the following examples in which suffixes occur outside compounds:

- (23) *-ful*
 [[*finger tip*] *-ful*]
 [[*tug boat*] *-ful*]
- less*
 [[*motor cycle*] *-less*]
 [[*sun shine*] *-less*]
- ness*
 [[[*tight fist*] *-ed*] *-ness*]
 [[*home sick*] *-ness*]

-ish

[[day long] -ish]

[[sky blue] -ish]

-y

[[tear gas] -y]

[[ice cream cone] -y]

-ly

[[praiseworthy] -ly]

[[breath taking] -ly]

-ed

[[shirt sleeve] -ed]

[[hard heart] -ed]

The various protective devices which Allen employs in reanalyzing these putative counterexamples to the EOH, will be examined in the following paragraph.

4.2 Prefixes occurring outside compounds

As was noted in § 3, the EOH predicts that # boundary affixes cannot occur outside compounds. According to Allen (1978:222-224), this prediction is borne out by examples such as the following:

(24) un#

unabsorbent

*un- [odor-absorbent]

unfilled

*un- [down-filled]

re#

re-dive

*re- [sky-dive]

re-clean

*re- [vacuum-clean]

de#

Verb: <i>de-magnetize</i>	* <i>de-</i> [<i>hand-magnetize</i>]
Noun: <i>de-mast</i>	* <i>de-</i> [<i>fore-mast</i>]

mal#

<i>mal-formation</i>	* <i>mal-</i> [<i>bone-formation</i>]
<i>mal-adjustment</i>	* <i>mal-</i> [<i>timing-adjustment</i>]

hyper#

<i>hyper-extension</i>	* <i>hyper-</i> [<i>muscle-extension</i>]
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mis#

<i>mis-pronunciation</i>	* <i>mis-</i> [<i>vowel-pronunciation</i>]
<i>mis-judgment</i>	* <i>mis-</i> [<i>court-judgment</i>]

The examples above appear to indicate that the # boundary prefixes may not attach to compounds, exactly as predicted by the EOH.

4.2.1 The prefixes *re-* and *pre-*

Although the prefixes *un-*, *re-*, *de-*, *mal-*, *hyper-* and *mis-* do not appear outside compound verbs, as illustrated in (24) above, there seem to be some cases in which prefixes can appear outside compounds. On the strength of the occurrence of derivatives based on compound verbs such as those in (21) and (22) above, Allen (1978:224, 231) concedes that the prefixes *re-* and *pre-* do appear to attach externally to some compound verbs. The derivatives in question are repeated in (25) for the sake of convenience.

- (25) *re-air-condition*
pre-air-condition
pre-proof-read
re-proof-read
re-type-write
re-tape-record

pre-tape-record

re-up-grade

Because both *re-* and *pre-* attach only to verbs, the bracketing of the examples in (25) should be similar to the bracketing which Allen (1978:225) proposes for *re-air-condition* and *pre-proof-read*.

- (26) [re [[air] [condition]]]
 [pre [[proof] [read]]]

According to Allen (1978:225), it is quite clear that the verbs in (25) in which the prefixes *re-* and *pre-* appear outside compounds, constitute violations of the EOH. Consequently, she (1978:225-232) has to defend the EOH in one way or another. The strategy which Allen (1978:225-232) employs is to deny these forms the status of actual counterexamples. This she achieves by drawing a conceptual distinction between compounds formed by regular Level III rules and compounds formed by back-formation. Hence, she (1978:231) argues that

"These examples [i.e. the examples in (25) above --- T.C.B.] violate the Extended Ordering Hypothesis only if the Level II prefixes *re-* and *pre-* attach externally to Level III derived compound verbs. But I have argued that compound verbs such as to air-condition, to type-write, to tape-record are not Level III derived compound verbs, but arise via a phenomenon limited to items in the permanent lexicon. The occurrence of external prefixes in compound verbs derived by back-formation is therefore not a violation of the Extended Ordering Hypothesis."²⁴⁾

Allen (1978:226) points out that the fact that the compounding rules for nouns and adjectives are overgenerating rules would lead one to expect the rule of compound verb-formation to be an overgenerating rule as well.²⁵⁾ According to her (1978:226), however, this is not the case. This rule does not generate a set of "possible compound verbs". The verbs *to air-condition*, *to proof-read*, *to ghost-write*, *to joy-ride*, etc. do not exemplify a productive morphological pattern. According to

Allen (1978:226), they belong to a very restricted class of compound verbs. To illustrate her point, she cites related verbs such as those in (27) claiming not only that these verbs are non-occurring words, but also that they are morphologically impossible.

- (27) **to water-condition*
 **to print-read*
 **to student-write*
 **to train-ride*

Allen thus argues that there is no compound verb formation rule in English.

The hypothesis that compound verbs in English differ from other compounds in that the former are not formed by Level III rules, is the basis of a first strategy to protect the EOH from refutation. The argument which forms the basis of this strategy, may be reconstructed as follows:

- (28) (a) There is no Compound Verb Formation rule which directly generates compound verbs in English.
- (b) Compound verbs in English are formed by means of one of two processes, viz. back-formation from items listed in the permanent lexicon and zero-derivation.
- (c) The EOH does not apply to morphological processes operating within the permanent lexicon.
- (d) Thus, the cases where prefixes appear outside compound verbs are not actual counterexamples to the EOH.

The (b) part of (28) is supported by two supplementary arguments. The first one concerns the nature of back-formation. Allen (1978:227-231) argues that verbs such as *to air-condition* and *to proof-read* are formed in the following way:

"Why can forms such as air-condition and tape-record occur as verbs, while the forms water-condition and book-record are not possible compound verbs. The answer lies in the fact that verbs such as air-condition and tape-record are associated with lexicalized nominal compounds; i.e. air-conditioner, tape-recorder. Notice that to air-condition does not mean 'to condition the air (by any means)', but rather 'to use an air-conditioner', where 'air-conditioner' itself has a highly specialized meaning ... By contrast, water-conditioner, book-recorder are possible compound nouns but are not lexicalized compounds with idiosyncratic meanings. Just in those cases where there are no lexicalized compound nouns, there are also no related compound verbs: *to water-condition, *to book-record ...

The traditional analysis of compound verbs [such as to air-condition and to proof-read --- T.C.B.] is that they are back-formations. That is, a verb such as to air-condition is derived via a process of re-analysis and affix-dropping from a related compound noun or adjective, the second element of which must be deverbal. For example, the compound nouns air-conditioner, ..., stage-manager, ..., are bracketed as shown below.

(310) [[stage]_N [[manage]_V er]_N]_N
 [[air]_N [[condition]_V er]_N]_N

The presence of the suffix -er, which attaches to verbs, can force a re-analysis; e.g.

(311) [[stage manage]_V er]_N
 [[air condition]_V er]_N

... As the data ... show, back-formation is applicable only to lexicalized compounds ... In other words, back-formation is a phenomenon which is limited to items in the permanent lexicon, and does not apply to compounds formed by level-ordered, overgenerating rules of morphology."

Allen's argument as regards back-formation, can be reconstructed as follows:

- (29) (a) There is no rule of Compound Verb Formation in English.
 (b) Compound verbs such as *to air-condition* and *to proof-read* have lexicalized compounds associated with them.

- (c) Back-formation applies only to lexicalized compounds listed in the Permanent Lexicon.
- (d) Thus, compound verbs such as *to air-condition* and *to proof-read* are formed via back-formation from items listed in the Permanent Lexicon.

The second supplementary argument in support of (28)(b), concerns the process of "zero-derivation". The process of zero-derivation is invoked by Allen (1978:231-232) to derive compound verbs from related compound nouns which are not lexicalized.

"There are compound verbs which are formed by a process of zero-derivation from a related compound nominal; e.g.

(313)	[joy-ride] _N	[[joy-ride] _N \emptyset] _V
	[snow-shoe] _N	[[snow-shoe] _N \emptyset] _V
	[black-mail] _N	[[black-mail] _N \emptyset] _V
	[pin-point] _N	[[pin-point] _N \emptyset] _V
	[day-dream] _N	[[day-dream] _N \emptyset] _V

... it will be argued that zero derivation is a component of the level-ordered morphology. Therefore, the Extended Ordering Hypothesis is relevant to zero-derived compounds, and predicts that Level II #boundary affixes should not appear outside zero-derived compound verbs. This prediction seems to be borne out by the facts, as illustrated by the following examples.

(314)	*re-black-mail	re-mail
	*re-pin-point	re-point
	*re-day-dream	re-dream."

Allen (1978:281) in fact claims that zero-derivation is a Level III morphological process. Her argument concerning compound verbs formed by zero-derivation is reconstructed in (30).

- (30) (a) Zero-derivation is a Level III morphological process.
 (b) No Level II #boundary affixes should appear outside zero-derived compound verbs.

- (c) The # boundary prefixes *re-* and *pre-* may not appear outside compound verbs such as *joy-ride*, *blackmail*, *day-dream*, etc.
- (d) Thus, the compound verbs *joy-ride*, *blackmail* and *day-dream* are formed by zero-derivation.

According to Allen (1978:232), only those compound verbs that are formed by means of back-formation can be prefixed by *re-* and *pre-*.²⁶⁾ These cases, however, fall outside the domain of the EOH. The zero-derived compound verbs which fall in the domain of the EOH, obey the restrictions of this hypothesis. By employing the strategy of re-analysis of the problematic data, Allen thus attempts to protect the EOH from refutation by forms such as *to re-air-condition*.

In the preceding discussion it became clear that Allen needs additional assumptions in order to protect the EOH from the apparent counterexamples in (25) above. Allen's (1978:224ff.) strategy of protecting the EOH by reanalyzing certain compound verbs as back-formations, depends heavily on the distinction between the Conditional and the Permanent Lexicon. The strategy itself is not wholly unproblematic either. A first problematic aspect of the strategy is Allen's conception of lexicalization. It is not clear on exactly what grounds she distinguishes between lexicalized and non-lexicalized forms. Consider, for instance, her discussion of the occurrence of the prefix *re-* outside compound verbs, as in *to re-air-condition*.

As was noted above, Allen (1978:227) regards compound verbs such as *to air-condition* to be back-formations from related lexicalized compound nouns. She (1978:228) claims that *air-conditioner*, in contrast to *water-conditioner*, is lexicalized, and as such has "a highly specialized meaning". According to her, *to air-condition* does not mean "to condition the air", but rather "to use an air-conditioner". However, she does not explain why *to air-condition* cannot mean "to condition the air" if *to condition* has the conventional meaning "to put into the required state".²⁷⁾

A related problem concerns the grounds on which it is decided whether or not a given word is lexicalized. Thus, it is not quite clear on what grounds Allen decides that nouns such as *air-conditioner* and

proof-reader have "highly specialized meanings". In order to substantiate claims such as these, Allen has to formulate explicit criteria on the basis of which it can be decided whether a given form is lexicalized or not. Her discussion proceeds in the absence of such criteria. The problem is clearly illustrated by the form *air-conditioner*. According to Webster's²⁸⁾ (1961:46), an air-conditioner is "one that air-conditions". The meaning of this form, according to this dictionary at least, thus seems to be fully compositional.

A second problematic aspect of Allen's reanalysis concerns the notion 'back-formation'. Linguists such as Marchand (1969) and Aronoff (1976) regard back-formation as a process which has mainly diachronic relevance. Compare the following remarks by Marchand (1969:3)²⁹⁾:

"The process called backderivation (backformation) has often diachronic relevance only. That peddle vb. [i.e. 'verb' --- T.C.B.] is derived from peddler sb. [i.e. 'substantive' --- T.C.B.] through reinterpretation is of historical interest. For synchronic analysis, however, the equation is peddle : peddler = write : writer, which means that the diachronic process of backderivation does not affect the derivative correlation for present-day speakers who do not feel any difference between the relationship write : writer on the one hand and peddle : peddler on the other."

According to Jackendoff (1975:649, 650), a formerly non-existent word such as *retribute*, for instance, enters the language by means of the process of back-formation from, say, *retribution*. But once *retribute* is in the lexicon, a restructuring is possible, resulting in *retribute* being regarded as the basic and *retribution* as the derived form. This account, in Jackendoff's opinion, captures the fact that a word formed by means of back-formation ceases to be recognized as such by speakers of English.

Allen does not adduce a single argument showing that the ideas of Marchand, Jackendoff and Aronoff regarding back-formation are untenable. In fact, it seems quite plausible to assume that speakers of English regard a noun such as *air-conditioner* as a derivative formed by *-er* Suffixation on the basis of the verb *air-condition*. The opposite view, viz. that speakers regard *air-conditioner* as the base from which the verb *air-condition* is derived, seems considerably less plausible. It

is undeniably so that the rule which attaches agentive *-er* in English is productively involved in the derivation of a large number of agentive nouns in English. An account of the forms *air-condition* : *air-conditioner* such as that of Allen (1978), thus seems to lack the appropriate grounding. Moreover, it is doubtful whether Allen's analysis of compound verbs as back-formations is the best of the alternatives available within her own framework. She (1978:198ff.) proposes a system in terms of which morphological features may be assigned to words in the Conditional Lexicon. These features specify whether or not certain words and their related derivatives may be selected by the Lexical Insertion transformations. She (1978:200) proposes that the feature [-Lexical Insertion; Strong] (or [-LIS]) be assigned to words derived by non-productive, semantically non-compositional word formation processes. Given that the compound verb formation rule is a non-productive rule, one may ask why Allen cannot merely assign the feature [-LIS] to the compound verbs *to air-condition* and *to tape-record*? According to her (1978:200), the fact that an item in the Conditional Lexicon is marked [-LIS] does not prevent it from participating in, what she calls, "further morphological derivation". Thus, the productive rule of *-er* Suffixation could apply to the verbs *to air-condition* and *to tape-record* to form the nouns *air-conditioner* and *tape-recorder*. However, Allen does not consider such an analysis at all. It seems, then, that Allen's reanalysis of certain compound verbs as back-formations is not particularly well-motivated, even within her own framework. Consequently, the hypothesis that compound verbs are formed by back-formation and zero-derivation, should be regarded as an ad hoc auxiliary hypothesis, introduced for the sole purpose of protecting the EOH. Given these problematic aspects of Allen's protection of the EOH, the apparent counterexamples in (25) above must be regarded as real counterexamples to the hypothesis.

4.2.2 The prefix un-

The occurrence of the prefix *un-* outside compounds, as in (31) below, also appears to contradict the second ordering claim of the EOH. The following cases are presented by Selkirk (1978:21):

- (31) [*un* [*hen-pecked*]]
 [*un* [*God-fearing*]]

Allen (1978:18ff.) argues that *un-* is a Level II # boundary prefix. Consequently, according to her theory (1978:222), *un-* cannot appear outside compounds. Allen presents the following examples in support of this claim:

- (32) **un-* [*fuel-injected*]
 **un-* [*sure-footed*]
 **un-* [*berry-gathering*]
 **un-* [*home-made*]

Allen does not regard examples such as those of (31) as posing a threat to the EOH. She (1978:288 n. 17) argues as follows:

"I find both examples [i.e. the examples in (31) --- T.C.B.] extremely marginal. When a reasonable number and variety of compound adjectives is examined, it becomes clear that non- attaches quite freely, but that un- is very generally excluded [from attaching to compounds --- T.C.B.]."

The claim that forms in which the prefix *un-* appears outside a compound are "extremely marginal", forms the basis of a second device which Allen employs to protect the EOH from potential counterexamples such as *un-hen-pecked*. Allen's argument can be reconstructed as follows:

- (33) (a) Unlike *non-*, *un-* does not attach "quite freely" to compounds.
 (b) The cases in which *un-* occurs outside compound adjectives are extremely marginal.
 (c) Thus, the cases in which *un-* occurs outside compound adjectives do not constitute a violation of the EOH.

Allen's treatment of the potential counterexamples in (31) is highly unsatisfactory. She denies these forms the status of real counterexamples to the EOH but makes no attempt to provide an acceptable explanation.

tion for the fact that these forms do occur in the language. Furthermore, the meaning of expressions such as "a reasonable number and variety of compound adjectives", "quite freely", "very generally" and "extremely marginal" is unclear. For example, how many examples can be considered to be a "reasonable number" of examples? The hypothesis that the cases in which *un-* appears outside compound adjectives are extremely marginal and cannot be regarded as counterexamples to the EOH, thus seems to be entirely ad hoc. Because Allen's protection of the EOH against potential counterexamples such as *un-hen-pecked* and *un-God-fearing* is not convincing, these forms too must be regarded as real counterexamples to the EOH.

This concludes the discussion of Allen's treatment of a first class of potential counterexamples to the EOH, viz. forms in which prefixes occur outside compounds. I have shown that Allen does not succeed in giving a satisfactory explanation for the apparent occurrence of the suffixes *re-*, *pre-* or *un-* outside compounds. Thus, despite her attempts to do so, all the examples under discussion must still be regarded as counterexamples to the EOH.

4.3 Suffixes occurring outside compounds

4.3.1 The suffix *-ful*

According to Allen (1978:234), the occurrence of the # boundary suffix *-ful* outside apparent compounds, as in (34) below, appears to constitute a violation of the EOH.

- (34) [[*finger tip*] *-ful*]
 [[*tug boat*] *-ful*]

Allen (1978:235) refuses to regard the examples in (34) as counterexamples to the EOH. She (1978:234-235) states that

"Selkirk's examples of a suffix -ful apparently appearing outside a compound (finger-tipful, tug-boatful) are misleading since this suffix -ful is not the -ful which is normally referred to as a neutral or word-boundary suffix, and which appears in adjectives such as harmful, fearful, worshipful, soulful, thoughtful. The meanings of these latter examples can be rendered approximately as 'full of harm', 'full of fear', 'full of worship', etc. But Selkirk's examples [finger-tip]ful, and [tug-boat]ful are not adjectives meaning 'full of fingertips' and 'full of tug-boats'; rather, they are nouns, meaning roughly 'a full (up) finger-tip', 'a full (up) tug-boat', parallel to nouns like cupful, handful, armful. The morphological status of this second noun-forming -ful must be established before it can be used as an argument for anything. It is possible that this second -ful is actually the free word full functioning as a compound constituent. It is certainly phonologically distinct from the true word-boundary suffix -ful:

- (316) worshipful [fəl] , [fl]
 saucerful [fUl] , *[fəl] , *[fl]"

Allen (1978:234) notes that there are two different morphemes, $-ful_1$ and ful_2 , which have different properties. A comparison of the properties of $-ful_1$ and ful_2 reveals the following differences:

(35)	$-ful_1$	ful_2
(a)	Examples : <i>harmful</i> <i>fearful</i>	(a) Examples : <i>finger-tipful</i> <i>tug-boatful</i>
(b)	Semantics : "full of x"	(b) Semantics : "a full (up) x"
(c)	Morphology: (i) appears in adjectives (ii) does not attach to compounds ³⁰⁾	(c) Morphology: (i) appears in nouns (ii) attaches to compounds
(d)	Phonology : (i) has zero stress (ii) phonetic representation: [fl] [fəl]	(d) Phonology : (i) has secondary stress (ii) phonetic representation: [fUl]

Thus, according to Allen (1978:235), the morpheme ful_2 which may attach to compounds, as in *finger-tipful* and *tug-boatful*, is actually the free word *full*. This claim forms the basis of an argument which may be reconstructed as follows:

- (36) (a) $-ful_1$ and ful_2 represent two different morphemes.
- (b) $-ful_1$ is a #boundary suffix which (i) means "full of x", (ii) appears in adjectives, (iii) does not attach to compounds, (iv) has zero stress and (v) is pronounced [fɪ] or [fəɪ].
- (c) ful_2 is a morpheme which (i) means "a full (up) x", (ii) appears in nouns, (iii) attaches to compounds, (iv) has secondary stress and (v) is pronounced [fʊɪ].
- (d) The morpheme $-ful$ which appears in *finger-tipful* has all the properties of ful_2 which is not a #boundary suffix.
- (e) Thus, forms such as *finger-tipful* and *tug-boatful* in which ful_2 occurs outside compounds do not constitute a violation of the EOH.

Whereas $-ful_1$ is a suffix which is attached by a Level II #boundary suffixation rule, ful_2 is an independent word which is attached by a Level III compounding rule. According to Allen (1978:235), the appearance of ful_2 outside compounds (eg. *finger-tipful*) is therefore no more surprising than the existence of doubly compounded words such as *shoe-box label* and *blackboard eraser*.

Thus, Allen protects the EOH by arguing that Selkirk (1978:21) has misanalyzed the forms *finger-tipful* and *tug-boatful*. According to Allen (1978:234), Selkirk has failed to note the differences between the word *full* which attaches to compounds and the suffix $-ful$ which appears in derivatives. If these differences are taken into consideration, the EOH is in no way contradicted by the relevant facts.

Allen's (1978:234-236) reanalysis of the cases in which $-ful$ attaches

to compounds is quite convincing. Nida (1946:82, 89) has made similar observations about the differences between the suffix *-ful* and the free word *full*.³¹⁾

"This form [i.e. *-ful* as in *harmful* --- T.C.B.] must be distinguished from the allomorph *-ful* which occurs in *handful*, *hatful* ..., and which has a different type of juncture and a secondary stress rather than a zero stress."³²⁾

"Allomorph 2 [i.e. *-ful* as in *handful* --- T.C.B.] combines in the same way as do compounding roots."³³⁾

We can conclude, then, that the hypothesis concerning the word status of the *ful* which appears outside compounds, is well-supported and therefore non-ad hoc.

4.3.2 The suffix *-less*

According to Allen (1978:236), Selkirk's (1978:21) account of forms such as those in (37), in which the suffix *-less* appears outside compounds, represents another case of misanalysis:

- (37) [[*motor cycle*] *-less*]
 [[*sun shine*] *-less*]

Allen attempts to analyze the *-less* cases in the same way as the cases with *-ful*. She (1978:236) argues as follows:

"Since there is also a free word *less* it is possible that these are also cases of compound formation. As in the case of *-ful*, the true word-boundary suffix *-less* and the *-less* which appears outside of compounds are phonologically distinct. In the true word-boundary suffix *-less*, the vowel of the suffix is a reduced vowel: *fatherless* [-ləs], *moneyless* [-ləs], *meaningless* [-ləs]. Where *-less* attaches outside a compound, however, it can be stressed and unreduced, [-ləs]. These facts make it doubtful that forms such as *motor-cycle-less* contain the word-boundary suffix *-less*."

The claim that the *-less* which appears outside compounds is the free word *less*, forms the basis of an argument representing yet another device to protect the EOH from refutation. The argument may be reconstructed as follows:

- (38) (a) There are two morphemes *less*₁ and *less*₂.
- (b) *-less*₁ is a # boundary suffix, of which the vowel is a reduced vowel, viz. [-ləs].
- (c) *less*₂ is a morpheme of which the vowel is stressed and unreduced, viz. [-les].
- (d) The morpheme *-less* which appears in *motor-cycle-less* has the properties of *less*₂ and is not a # boundary suffix.
- (e) Thus, cases such as *motor-cycle-less* and *sun-shine-less*, where *less*₂ occurs outside compounds, do not constitute violations of the EOH.

Like *ful*₂, *less*₂ is regarded by Allen as an independent word which can be attached to other simple or compound words by means of a Level III compounding rule.

However, Allen's protection of the EOH from potential refutation by examples such as *motor-cycle-less* and *sun-shine-less* is not quite convincing. The major problem with Allen's analysis is that she does not provide adequate evidence for the claim that a distinction should be made between two morphemes *less*. The only evidence that Allen (1978: 236) presents in support of this distinction, is phonological evidence. According to her, the vowel of the *-less* attaching to compounds is stressed and unreduced, i.e. [les].

According to Webster's (1961:1296), the word *less* is pronounced "\les\" as in *bet* and *bed*. The pronunciation of the suffix *-less*, by contrast, is "\lès\", as in *habit* and *duchess*. This distinction corresponds to Allen's (1978:236) distinction between [les] and [ləs]. According to Webster's (1961:1296), the meaning of the word *less* is "to a lesser extent or degree", whereas the suffix *-less* means

"destitute of, not having, free from". Allen provides no semantic evidence in support of her proposed distinction between two instances of *less*, but her claims have certain semantic consequences. In claiming that the free word *less* attaches outside compounds as in *sun-shine-less*, Allen is implicitly claiming that the meaning of the word *less* is added to the meaning of the compound *sun-shine*. Thus, it is predicted that a complex word such as *sun-shine-less* will mean something like "sun-shine, but to a lesser extent or degree", or "not so much sun-shine". However, *sun-shine-less* does not have this meaning. Rather, it means "without sun-shine". The meaning of *-less* in *sun-shine-less* is identical to that of the suffix *-less*. Thus, it follows that it is in fact the suffix *-less* which attaches to *sun-shine*. Allen's claims about the phonetic form of the *less* which appears outside compounds thus makes predictions about its morphological status and its meaning that are incorrect. Allen also fails to demonstrate, as she (1978:236) did in the case of *-ful*, that the # boundary suffix *-less* does not attach to compounds. The hypothesis that the *-less* which attaches to compounds is the word *less*, is completely ad hoc. It may be concluded, therefore, that it is in fact the # boundary suffix *-less* which occurs outside the compounds in (37).³⁴⁾ In sum, Allen fails to protect the EOH from potential refutation by the counterexamples in (37). The occurrence of the # boundary suffix *-less* outside compounds, constitutes a clear violation of the EOH.

4.3.3 The suffixes *-ness*, *-ish* and *-y*

The third class of potential counterexamples which Selkirk (1978:21) provides, includes the forms in (39). These examples illustrate the attachment of the suffixes *-ness*, *-ish* and *-y* outside compounds.

- (39) *-ness*: [[tight fisted] *-ness*]
 [[home sick] *-ness*]
- ish* : [[sky blue] *-ish*]
 [[day long] *-ish*]
- y* : [[tear gas] *-y*]
 [[ice cream cone] *-y*]

In all the examples above, an affix occurs outside a compound. However, Allen (1978:237) denies forms containing the suffixes *-ness*, *-ish* and *-y* the status of true counterexamples to the EOH. She (1978:236-237) bases her argument on the claim that these suffixes may attach to "non-morphological units", as she calls them. Consider the following examples in which the suffixes *-ness*, *-ish* and *-y* allegedly attach to phrases:

- (40) *-ness*: [black and blue] *ness*
-ish : [blood-and-thunder] *ish*
-y : [spider's web] *y*.³⁵⁾

Allen (1978:238) notes that the occurrence of a form such as *spider's webby* appears to be totally inconsistent with the claim that inflectional processes are syntactic phenomena which follow all derivational processes. According to her (1978:238), the bracketed phrases in (40) have lexicalized meanings. As such, they are listed in the Permanent Lexicon. Thus, the fact that suffixes attach to them is completely irrelevant to the evaluation of the EOH. However, these suffixes do behave extraordinarily in that they are allowed to attach to idiomatic phrases listed in the Permanent Lexicon. Allen (1978:239) calls the process by means of which affixes are attached to items in the Permanent Lexicon, "stretchable suffixation". According to her (1978:239), only a few derivational suffixes may "stretch" their domain of application so as to include items in the Permanent Lexicon.

By claiming that the suffixes *-ness*, *-ish* and *-y* are stretchable suffixes, Allen (1978:239ff.) attempts to account for the examples in (39). Let us consider the steps taken by Allen (1978:240-241) to deny these examples the status of actual counterexamples to the EOH.

"The examples ... clearly show that where the suffixes *-ness*, *-ish* and *-y* attach to compounds, they are attaching to lexicalized compounds, that is, they attach to compounds which are non-compositional and which must consequently be listed in the permanent lexicon ...

I have already shown that it is necessary to make some kind of special statement about *-ness*, *-ish* and *-y* to the effect

that they may attach to lexicalized phrases. This necessary statement also explains why the suffixes in question attach to lexicalized compounds, but not to productive compounds. Indeed, given the independent establishment of stretchable suffixation, the null hypothesis would be that stretchable suffixation is applicable to all items in the permanent lexicon. The fact that the suffixes *-ness*, *-ish* and *-y* attach to lexicalized compounds, but not to productive compounds, is thus completely in accord with the independently established notion of stretchable suffixation. Finally it should be clear that the attachment of *-ness*, *-ish* and *-y* to lexicalized compounds can no longer be construed as a violation of the Extended Ordering Hypothesis."

Allen's argument involving the notion of 'stretchable suffixation' may be reconstructed as follows:

- (41) (a) The EOH does not apply to morphological processes operating within the Permanent Lexicon.
- (b) The forms to which *-ness*, *-ish* and *-y* attach as stretchable suffixes are in the Permanent Lexicon.
- (c) Thus, the existence of forms such as *tight-fistedness*, *sky-blue-ish* and *tear-gas-y* cannot be construed as a violation of the EOH.

Allen (1978:240) notes that the suffixes *-ness*, *-ish* and *-y* cannot attach to semantically compositional compounds formed by fully productive compounding rules. She presents examples such as the following to illustrate her point:

- (42) **large-fistedness*
 **death-dayish*
 **deer-fleshy*

By positing the notion of stretchable suffixation, Allen thus attempts to exempt the attachment of the # boundary suffixes *-ness*, *-ish* and *-y* to compounds from the ordering restrictions imposed by the EOH. Stretchable suffixation is a phenomenon limited to the domain of the Permanent Lexicon. As such, it falls outside the scope of predictions about morphological well-formedness made by the EOH.

Allen's (1978:238-240) reanalysis of the counterexamples in (39) above is not without problems, however. One of the basic problems of this reanalysis concerns her use of the notion 'lexicalized'. The factual basis of the reanalysis is the claim that the phrases and compounds to which the suffixes *-ness*, *-ish* and *-y* attach, are lexicalized forms. As noted with reference to compound verbs in §4.2.1 above, it is not clear what criteria Allen adopts to distinguish between lexicalized and non-lexicalized forms. An examination of the examples presented by Allen (1978:240) in support of the claim that *-ness*, *-ish* and *-y* attach to lexicalized compounds only, reveals that the notion 'lexicalized' with which she operates is rather obscure. The list of lexicalized compounds which Allen (1978:240) presents, includes compounds that are by no means obviously non-compositional in meaning. The following compounds, for example, could just as well be regarded as having fully compositional meanings:

- (43) *sky-blue* *care-free*
 day-long *ring-leader*
 tear-gas *head-ache*
 short-sighted *moon-beam*
 color-fast

An additional problem with Allen's reanalysis of the examples in (39) concerns the form of the Permanent Lexicon. One of the consequences of the introduction of the notion of stretchable suffixation, is that the Permanent Lexicon contains a large number of morphologically complex forms for which Allen's morphological theory offers no explanation. Allen needs two types of affixation rules within her morphological theory, viz. (i) affixation rules which are subject to the EOH, and (ii) affixation rules which attach stretchable suffixes to forms listed in the Permanent Lexicon. However, Allen does not clarify the nature of stretchable suffixation as a process operating in the Permanent Lexicon. Consequently, her theory offers only an arbitrarily restricted account of word formation in English.

The most fundamental problem with Allen's reanalysis of the apparent counterexamples to the EOH, is the complete absence of arguments in

support of the distinction between stretchable and non-stretchable suffixes. According to Allen (1978:239),

"stretchable suffixation is not a part of regular word-formation, but a marginal and idiosyncratic feature of a small number of derivational suffixes."

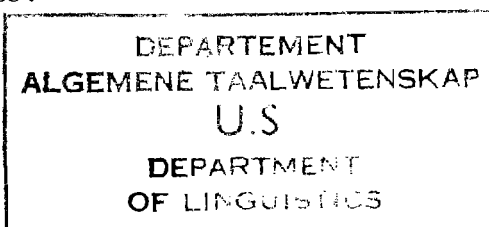
Allen does not attempt to characterize the notion 'stretchable suffixation' in such a way that it becomes possible to predict whether or not a suffix *S* will have the status of a stretchable suffix. Such an independent characterization would have contributed much to the plausibility of her theory. However, the fact that she finds it necessary to postulate a process which she herself regards as "marginal and idiosyncratic", casts serious doubts on the credibility of the EOH. If an independently motivated characterization of the notion 'stretchable suffix' were available, the distinction between "ordinary" and "stretchable" suffixes would have been more clear. Such a characterization could also have formed the basis for an explanation of the non-occurrence of "stretchable prefixes". In the absence of such a characterization, however, the notion 'stretchable suffixation' remains a marginal, ad hoc device, introduced solely for the purpose of saving the EOH from refutation.

4.3.4 The suffix *-ly*

Selkirk (1978:21) also presents the following examples of compound adjectives to which *-ly* has been attached:

- (44) [[*praiseworthy*] *-ly*]
 [[*breathtaking*] *-ly*]

Allen (1978:241-243) treats these examples separately, holding that they represent two distinct types.



4.3.4.1 The type *praiseworthyly*

Allen (1978:242) argues that forms such as *praiseworthyly* cannot be regarded as counterexamples to the EOH. According to her,

"... examples in -worthily cannot be construed as counterexamples to the Extended Ordering Hypothesis since -worthy is a Level II word-boundary suffix ... The evidence for this claim is that adjectives in -worthy can be prefixed by un-: untrustworthy, unseaworthy. True compound adjectives cannot be prefixed by un-: *uncollege-educated, *unoccean-going. Therefore -worthy must be a Level II word-boundary suffix, not a constituent of a compound. The Level II word-boundary suffix -ness can also attach to -worthy adjectives, which is to be expected if -worthy is itself a Level II suffix: trustworthiness, seaworthiness. The attachment of adverb-forming -ly to adjectives in -worthy is consequently not problematic."

The reanalysis of *-worthy* as a Level II # boundary suffix forms the basis of Allen's strategy to protect the EOH from refutation. She presents two arguments which can be reconstructed as follows:

- (45) (a) Level II # boundary affixes may attach to words derived by Level II affixation rules.
- (b) Adjectives in *-worthy* may be (i) prefixed by the Level II # boundary prefix *un-* and (ii) suffixed by the Level II # boundary suffix *-ness*.
- (c) Thus, *-worthy* is a Level II # boundary suffix and not a constituent of a compound.
- (46) (a) Level II # boundary affixes may attach to words derived by Level II affixation rules.
- (b) The suffixes *-worthy* and *-ly* are both Level II # boundary suffixes.
- (c) Thus, *praiseworthyly* is not a compound derivative and consequently not a counterexample to the EOH.

What Allen in fact does in the case of *-worthy*, is to argue that *praiseworthyly* is not analyzable as a compound, *praiseworthy*, to which the suffix *-ly* has attached, but rather as a derived word with two suffixes, *-worthy* and *-ly*.

Allen's reanalysis of *praiseworthyly* as a derivative is non-objectionable. Marchand (1969:356-357) does not regard adjectives formed by attaching *worthy* as compound adjectives. According to him, adjectives formed by *-worthy* Suffixation can be prefixed by *un-*, whereas compound adjectives cannot be prefixed at all. Marchand regards *-worthy* as a so-called "semi-suffix". He (1969:356) considers "semi-suffixes" to be

"such elements as stand midway between full words and suffixes. Some of them are used only as second words of compounds, though their word character is still clearly recognizable."

However, neither Allen, nor Marchand investigates the difference(s) between the word *worthy* and the suffix *-worthy*. Consider the two instances of *worthy* in the sentences (47)(a) and (b) respectively.

- (47) (a) *He is worthy of your trust/praise.*
 (b) *He is trustworthy/praiseworthy.*

In §§ 4.3.1 and 4.3.2 above, we considered Allen's attempts at distinguishing between two morphemes *ful* and two morphemes *less*. Recall that she (1978:234-236) draws a distinction between the #boundary suffixes *-ful₁* and *-less₁* and the morphemes *ful₂* and *less₂* which are free words. In both cases, she provides some evidence for the distinction. In the case of *worthy*, however, Allen makes no effort to point out the differences between the #boundary suffix *-worthy* and the word *worthy*, which is an unfortunate omission on her part. On the whole, however, the hypothesis that *-worthy*, in words such as *praiseworthy*, is a Level II #boundary suffix, may be regarded as fairly non-ad hoc. Therefore, Allen is quite justified in claiming that the existence of words such as *praiseworthy* does not bear negatively on the EOH.

4.3.4.2 The type *breathtakingly*

Although the attachment of adverb-forming *-ly* to adjectives in *-worthy* can be explained, there are a few cases in which *-ly* attaches to forms other than *-worthy*. The following examples are presented by Allen (1978:242):

- (48) *breathtakingly*
painstakingly
level-headedly
single-handedly
whole-heartedly
single-mindedly

Having discussed the potential counterexamples in (48), Allen (1978: 242-243) concludes that the few cases in which *-ly* attaches outside compounds "are not illustrative of a general morphological pattern". She argues as follows for this conclusion:

"... it seems to me that adverb-forming *-ly* is another case of a stretchable suffix. First of all, there are cases in which *-ly* attaches to phrasal units which are lexicalized, e.g.:

- (328) matter-of-factly
stand-offish ly [sic]
Mark Twainish ly [sic]

The few compounds to which *-ly* may attach are also lexicalized to some extent (e.g. *level-headed*, *single-handed*, *painstaking*). It is quite clear that *-ly* does not attach to productive, compositional adjectives: **freedom-lovingly*, **color-blindly*, **bitter-sweetly*, **life-givingly*, **chicken-heartedly*."

The notion 'stretchable suffix' again forms the basis of a strategy for protecting the EOH from disconfirming evidence. This strategy consists in Allen's presenting two arguments that may be reconstructed as follows:

- (49) (a) Stretchable suffixes
- (i) attach to lexicalized phrases and compounds listed in the Permanent Lexicon;
 - (ii) do not attach to compounds with compositional meanings which are formed by productive rules.
- (b) The suffix *-ly*
- (i) attaches to lexicalized phrases and compounds listed in the Permanent Lexicon, e.g. *matter-of-factly*, *level-headedly*;
 - (ii) does not attach to compounds with compositional meanings which are formed by productive rules, e.g. **freedom-lovingly*.
- (c) Thus, the suffix *-ly* is a stretchable suffix.
- (50) (a) The suffix *-ly* is a stretchable suffix which attaches to items in the Permanent Lexicon.
- (b) The EOH does not apply to morphological processes operating within the Permanent Lexicon.
- (c) Thus, the existence of forms such as *breathtakingly*, in which *-ly* appears outside a compound, cannot be construed as a violation of the EOH.

The strategy employed by Allen to protect the EOH from potential disconfirmation by forms such as *breathtakingly*, is essentially the same as the strategy by means of which she attempted to get rid of potential counterevidence involving the appearance of the suffixes *-ness*, *-ish* and *-y* outside compounds, as in (41) above. Allen (1978:242-243) acknowledges this when she remarks that

"... it seems that -ly requires the same kind of idiosyncratic statement necessary for the stretchable suffixes -ness, -ish and -y."

Allen herself (1978:243) notes that the data in support of the analysis

of *-ly* as a stretchable suffix are not as clear as those presented in support of the analysis of the other three suffixes as stretchable suffixes. Consequently,

"in this case [i.e. in the case of *-ly* --- T.C.B.], the evidence is neither conclusively in support of the Extended Ordering Hypothesis, nor conclusively against it."

The mere fact that Allen does not regard the evidence derived from *-ly* adjectives as bearing positively on the merit of the EOH, reduces the power of her argumentation considerably. Moreover, the same objections that were raised in § 4.3.3 against the notion 'stretchable suffixation' apply in the case of *-ly*. These objections concern Allen's notion 'lexicalized', the form of the Permanent Lexicon, and the grounds for introducing the notion 'stretchable suffixation'.

4.3.5 The suffix *-ed*

The last class of potential counterexamples to the EOH noted by Selkirk and presented by Allen (1978:243, 245, 246), includes forms such as the following:

- (51) [shirt sleeve] d³⁶
 [snow-suit] ed
 [bowler-hat] ed
 [pig-head] ed
 [lion-heart] ed

According to Allen (1978:245), the adjective-forming # boundary suffix *-ed* generally cannot attach to N - N compounds.

- (52) * [beach-pebble] d
 * [pencil-point] d

In the case of *shirt-sleeved*, *snow-suited*, *bowler-hatted*, *pig-headed*,

etc. *-ed* appears to attach to N - N compounds. According to Allen (1978:245), the bracketings in (51) above are motivated by semantic considerations. She (1978:246) then argues, on the basis of morphological considerations, that the bracketing of these forms should be different. Thereby she attempts to deny the forms in (51) the status of true counterexamples to the EOH. In essence, she (1978:246-247) argues that

"... the -ed suffix attaches productively to nouns of certain semantic classes, and as an overgenerating suffix forms -ed adjectives such as the following.

(333)	pebbled	pointed	treed	sided	flowered
	moneyed	forested	crusted	sleeved	suited
	hatted	booted	footed	headed	handed
	fisted	bearded	forked	hooded	sleeved

Theories of morphology which do not involve the notion over-generation, ... are ... faced with a problem in explaining the occurrence of words which have no independent status as lexical items, and yet appear freely in compounds; for example sleeved, hearted ... appear in the compounds shirt-sleeved, lion-hearted ... A non-overgenerating theory can only deal with these cases by attaching the -ed suffix outside the compound, as does Selkirk ... The attachment of the -ed suffix to simple nouns is necessarily an overgenerating rule. This being so, all denominal -ed adjectives which appear in compounds, whether they occur as independent lexical items or not, will be available for direct adjunction with other lexical items to form compound adjectives.

Now, there is a rule of compound adjective formation which adjoins nouns and adjectives on the pattern of color-blind... e.g.

(334) [[.....]_N [.....]_A]_A

Any adjective, derived or underived, may participate as the second constituent in N - A adjective compounding. Consequently, all -ed adjectives ... may appear as the second constituent of N - A compounds. In other words, all compound adjectives containing the linear sequence N - N - ed are analysable as

(335) [[.....]_N [[.....]_N -ed]_A]_A

... Semantic considerations ... support the proposed analysis of N - N - ed adjectival compounds."

The claim that N - N - ed compound adjectives must be analyzed as N - A

compounds, forms the basis of a strategy employed by Allen to protect the EOH from refutation. This strategy consists in Allen's presenting two arguments which may be reconstructed as follows:

- (53) (a) The rule of Adjective Compounding adjoins nouns to adjectives: $[[\dots]_N [\dots]_A]_A$.
- (b) The overgenerating rule of *-ed* Suffixation generates adjectives of the form $[[\dots]_N -ed]_A$.
- (c) Thus, compound adjectives containing the linear sequence N - N - ed can be analyzed as $[[\dots]_N [[\dots]_N -ed]_A]_A$.
- (54) (a) According to the EOH, no affix may appear outside a compound.
- (b) Compound adjectives containing the linear sequence N - N - ed, such as *shirt-sleeved*, are analyzed as $[[\dots]_N [[\dots]_N -ed]_A]_A$.
- (c) Thus, forms such as *shirt-sleeved* do not constitute a violation of the EOH.

Allen (1978:251) presents additional evidence for her analysis of N - N - ed compound adjectives in the form of A - N - ed compound adjectives such as the following:

- (55) *hard-hearted*³⁷⁾
heavy-handed
bushy-tailed
one-handed
three-cornered

According to Allen (1978:252), an analysis of these compound adjectives as compound nouns with an external *-ed* suffix is impossible within her morphological theory. The reason for this is that there is no overgenerating rule of A - N compound formation which produces forms such as the following:

- (56) **hávd-heart*
 **héavy-hand*
 **búshy-tail*
 **óne-hand*
 **thréé-corners*

Consequently, there are no bases on which the *-ed* Suffixation rule can operate. Allen (1978:252) discusses the possibility that A - N compounds may not be formed by a regular process of word formation. Rather, they may arise in the lexicon as the result of a reanalysis of lexicalized phrases:

- (57) *hard héart*
heavy hánd
bushy táil
one hánd
three córnors

Such an analysis would imply that *-ed* attaches to phrases. Allen (1978:253) notes that an analysis in which *-ed* attaches to phrases is unacceptable, since it makes empirically false predictions. For example, on such an analysis, it should be possible for *-ed* to attach to phrases which are properly specified for number agreement, e.g. *two hands*, *four corners*, *five feet*. Allen (1978:253) shows that this is impossible: whenever *-ed* appears as a suffix, there is no marker of plurality on the noun:

- (58) *two-handed* **two-handsed*
four-cornered **four-cornersed*
five-footed **five-feeted*

According to Allen (1978:253),

"The absence of the plural inflection in these examples is predictable only when A-N-ed compound adjectives are analysed with the -ed suffix inside the compound; i.e.

(344) [[.....] _A [[.....] _N ^{ed}] _A] _A

The regularly derived, overgenerated -ed adjectives hearted, handed, footed, etc. are compounded with a modifying adjective (two, many, four, etc.) in the derivational morphology at a point where questions of plurality specification by grammatical inflection are not relevant."

Thus, Allen analyzes all compound adjectives containing the linear sequence A - N - ed as A - A adjectival compounds with the following internal morphological structure:

(59) [[.....] _A [[.....] _N ^{-ed}] _A] _A

According to Allen (1978:254), compound adjectives such as those in (60), with the internal morphological structure of (59), constitute

"a subset of a more general adjective compounding process in which two non-compound adjectives, simple or derived, are adjoined." 38)

(60) *grey-green*
icy-cold
easy-going
bitter-sweet

On this analysis no reference is made to the internal morphological structure of the constituent adjectives.

Allen's reanalysis of the counterexamples in *-ed* is not without problems. Particularly questionable are aspects of her discussion of the attachment of *-ed* to phrases. According to her (1978:253), the claim that *-ed* may attach to compounds would imply that *-ed* can attach to phrases like *two hands* or *four corners* as well. However, this is not possible. No inflectional affixes may appear inside *-ed*:

(61) **two-handsed*
 **four-cornersed*

Allen's argument is valid only on the assumption that word formation rules apply to surface structure phrases. It is possible to argue that forms such as *two-handed* and *four-cornered* are formed on the basis of deep structure phrases. A general principle will then prevent the deep structure features representing number, etc. from being realized in derived words. On this analysis, it will be impossible for the suffix *-ed* to attach to a form such as *two-hands* or *four-corners*.³⁹⁾

Allen (1978:249, 255) attempts to provide semantic considerations as supporting evidence for her analyses of N-A and A-A compounds. According to her (1978:249), the analysis [*beach-pebble*]*d* falsely predicts that *beach-pebbled* means "having beach-pebbles". By contrast, the analysis [*beach*][*pebbled*] correctly predicts the meaning "pebbled like a beach". Likewise, she (1978:255) argues that the semantic interpretation of compounds such as *tight-fisted* is "fisted modified by tight".

Botha (1980:152 n.9) notes that it is of some importance to Allen that *beach-pebbled* should be analyzed as in (62)(a) and not as in (62)(b).

- (62) (a) [*beach*][*pebbled*]
 (b) [*beach-pebble*]*d*

The analysis (62)(b) contradicts the ordering claim of the EOH that no affix can attach to a compound. In this case, the analysis in (62)(a) forms the basis of the correct semantic interpretation of the compound, viz. "pebbled like a beach". However, Botha (1980:152 n.9) observes that morphological representations of the type (62)(a) make incorrect predictions about the meanings of compounds such as *shirt-sleeved*, *snow-suited* and *bowler-hatted*:⁴⁰⁾

- (63) (a) [*shirt*][*sleeved*]
 (b) [*snow*][*suited*]
 (c) [*bowler*][*hatted*]

The form *shirt-sleeved* does not have the meaning "sleeved like a shirt", which is the meaning predicted by the analysis (63)(a). Likewise, *snow-suited* does not mean "suited like snow", and *bowler-hatted* does not mean "hatted like a bowler". These compounds rather have the meanings predicted by the analysis (62)(b), viz. "characterized by the presence of shirt-sleeves", "characterized by the presence of (a) bowler-hat(s)", etc. Allen makes no attempt to account for the former incorrect predictions of the EOH.

The remarks regarding the semantic interpretation of compound adjectives such as *hard-hearted* and *tight-fisted* are not entirely convincing either. Allen's claim that the compositional meaning of compound adjectives is essentially that of "modifier-modified" is so vague that it can contribute little to the specification of the meaning of the compound.

It is possible to assign meanings such as "having a hard heart", "having a tight fist", etc. to the forms *hard-hearted* and *tight-fisted*. However, these meanings cannot be derived from the analyses [*hard*] [*hearted*] and [*tight*] [*fisted*], which Allen (1978:255) proposes. We have to conclude that the semantic interpretation "modifier-modified" which Allen assigns to compound adjectives, is too vague to contribute to the credibility of her analysis. In sum, Allen does not succeed in arguing convincingly against the potential *-ed* counterexamples to the EOH. The hypothesis that the rule of Adjective Compounding adjoins nouns to adjectives, irrespective of the internal morphological structure of the adjectives, should be regarded as ad hoc. The sole function of this hypothesis seems to be that of protecting the EOH from refutation.

This concludes the discussion of Allen's treatment of potential counterexamples to the EOH involving the occurrence of suffixes outside compounds. The following points emerged from the discussion:

- (a) The form *-ful* which appears outside compounds is not the suffix *-ful*, but the word *full*. Thus, forms in which *-ful* attaches to a compound do not violate the EOH.
- (b) The form *-worthy* which appears in complex words such as *praiseworthy*, is a suffix. Thus, the attachment of *-ly* to words containing *-worthy* does not violate the EOH.

- (c) The reanalyses of the forms in which *-less*, *-ness*, *-ish*, *-y*, *-ly* and *-ed* attach to compounds are all unacceptable. Thus, these forms must be regarded as real counterexamples to the EOH.

The acceptability of the various strategies employed by Allen to protect the EOH from refutation will be discussed in §6.

.5 English primary compounds as bases of affixation rules

We will now briefly consider the views of other linguists on the appearance of affixes outside compounds in English. Jespersen (1946:336) notes that "occasionally *-ism* words may be derived from ... compounds". Some of his examples are:

- (64) *old-maidism*
public-schoolism
spread-eagleism

The following examples are also presented by Jespersen (1946):

- (65) *old-maidish*
*schoolgirlish*⁴¹⁾

blackguardism
blockheadism
*landlordism*⁴²⁾

Attorney-generalship
head-mistress-ship
*postmastership*⁴³⁾
*newspaperdom*⁴⁴⁾

In his discussion of derivatives formed from adjunct + substantive sequences, Jespersen (1946:235) explicitly states that derivatives can also be formed on the basis of

"...some compounded words, eg. back-hander (blow) / birth-controller 'supporter of the birth-control movement' / blackbirder ... / mountain-topper (climber) / pea-souper (dense fog) / sundowner (...) 'tramp who times his arrival for the evening; drink at sunset'."

Marchand (1969:50, 265, 280) also cites some examples which can be regarded as cases where affixes attach to compounds, although he does not present them as such.

(66)	(a)	<i>colorblindness</i>	(b)	<i>weekender</i>
		<i>selfconsciousness</i>		<i>carpetbagger</i>
		<i>colorfastness</i>		<i>bobbysoxer</i>
		<i>thread-bareness</i>		<i>night-lifer</i>
		<i>tongue-tiedness</i>		<i>pigtailer</i>
		<i>cockfighting</i>		<i>first-nighter</i>
		<i>palefaced</i>		<i>underworlder</i>
		<i>hunchbacked</i>		<i>Scotland-Yarder</i>
		<i>knock-kneed</i> ⁴⁵⁾		<i>backhander</i>

Adams (1973:34) comments on forms such as *first-nighter*, which she regards as "derivational compounds". According to her,

"Derivational compounds which are not parasynthetic are exemplified by first-nighter, broken-hearted, made up of the compound stems first night, broken heart and the suffixes -er, -ed."⁴⁶⁾

Another proponent of the view that affixes can appear outside compounds, is Levi (1977). According to her (1977:326-327), the very fact that derivational affixes attach to both nouns and complex nominals, constitutes evidence for her claim that complex nominals are dominated by the node label N.⁴⁷⁾

The following data presented by Levi (1977:328) are of interest to us:

- (67) *intellectual historian*
historical linguist
quantum mechanician
statistical mechanician
classical mechanician

According to Levi (1977:328), *intellectual historian* means neither "a historian who is intellectual", nor "a historian dealing with the intellect". Rather, it means "one who does [what is known as] intellectual history". Similarly, a *historical linguist* is not a linguist dealing with history, but one who does historical linguistics. A *quantum mechanician* is a physicist who specializes in quantum mechanics, a *statistical mechanician* is a physicist who specializes in statistical mechanics and a *classical mechanician* is a physicist who specializes in classical mechanics. In order to derive the correct meanings for these complex nominals, Levi (1977:328) assigns them the following internal bracketings:

- (68) [*intellectual histor*] *ian*
 [*historical lingu*] *ist*
 [*quantum mechanic*] *ian*
 [*classical mechanic*] *ian*

Levi's (1977:328) conclusion is that

"the phrase quantum mechanician in 7(c) [i.e. with the internal bracketing as in (68) above --- T.C.B.] must be derived not by combining the nonexistent noun mechanician with the noun quantum, but rather by combining the full CN [i.e. 'complex nominal' --- T.C.B.] quantum mechanician with the appropriate agentive suffix." 48)

Consequently,

"it is these [i.e. the cases in (68) above --- T.C.B.] which force us to conclude that these suffixes may be attached to the CN [i.e. 'complex nominal' --- T.C.B.] as a whole rather than just to the head noun." 49)

Levi's claim that complex nominals are in fact nouns is not relevant here. What is important, though, is the type of evidence which she furnishes in support of her claim.⁵⁰⁾

As was shown in previous paragraphs, Selkirk (1978:21) also presents a number of examples which, according to her, must be analyzed as consisting of a compound stem and a neutral affix. She (1978:17) identifies four fundamental properties which distinguish neutral affixes from non-neutral affixes in English. The property relevant to the present discussion is the one which she formulates as follows:

- (69) "Neutral affixes can appear 'outside' compounds; non-neutral affixes cannot."

Examples of the data which Selkirk (1978:21) presents as evidence in support of the claim (69) were discussed above. Some of the forms are repeated in (70).

- (70) [[shirt sleev] -ed]
 [[home sick] -ness]
 [[tear gas] -y]
 [un- [God fearing]]
 [re- [air-condition]]⁵¹⁾

(Selkirk 1981:270-271) also deals with the appearance of affixes outside compounds. In this study she claims that the suffix *-hood* which usually attaches to single nouns as in *neighborhood*, may attach to compound nouns as well. She presents the following examples:

- (71) *At the beginning, fifteen year old Nancy was a confirmed*
 { *pick pocket*
run away
movie buff } *but the period of her* { *pick pocket*
run away
movie buff } *-hood*
turned out to be of relatively short duration.

According to Selkirk (1981:270), the example *run away-hood* unmistakably shows that the suffix *-hood* must attach to the compound as a whole and

not to the righthand constituent of the compound. Given the fact that "a preposition does not accept affixes, nor does *-hood* accept prepositions", no other conclusion is possible. Selkirk (1981:271) points out that this conclusion has serious consequences for morphological theories which separate compounding and affixation processes into discrete subsystems of the grammar. A level-ordered morphological theory, as proposed by Siegel (1974) and by Allen (1978), requires all affixation rules to operate before all compound rules. Hence, all affixes, both derivational and inflectional, must be contained within compounds and cannot appear outside them.⁵²⁾

The preceding discussion has revealed that various linguists adopt the position that affixes may appear outside compounds in English. Allen's (1978) attempted reanalysis of the examples presented by Selkirk (1978:21) does not remove the threat to the EOH. Other examples, such as those presented by Jespersen (1946), Marchand (1969), Adams (1973), Levi (1977) and Selkirk (1981), remain to be accounted for.

6 Conclusion

In this chapter I have isolated the major shortcomings of Allen's defence of the EOH. It was shown that, with two exceptions, all the protective devices which she employs in denying certain counterexamples the status of actual counterexamples to the EOH, are objectionable. In (72), a brief summary of these protective devices is presented.

(72)

Strategy	p.	Ad hoc/ Non- ad hoc
(a) There is no rule of Compound Verb Formation which directly generates compound verbs in English. These verbs are formed by means of one of two processes, viz. back-formation and zero-derivation.	69	Ad hoc
(b) The forms in which <i>un-</i> appears outside compound adjectives are extremely marginal and cannot be regarded as counterexamples to the EOH.	75	Ad hoc
(c) There are two morphemes <i>ful</i> , the #boundary suffix, <i>-ful₁</i> and the word <i>ful₂</i> . The form <i>-ful</i> which appears outside compounds is <i>ful₂</i> .	78	Non- ad hoc
(d) There are two morphemes <i>less</i> , the #boundary suffix <i>-less₁</i> and the word <i>less₂</i> . The form <i>-less</i> which appears outside compounds is <i>less₂</i> .	80	Ad hoc
(e) Stretchable suffixation is not an ordinary, productive word formation process. Stretchable suffixes attach to words in the Permanent Lexicon only.	83	Ad hoc
(f) The form <i>-worthy</i> which appears in complex forms such as <i>praiseworthy</i> is a #boundary suffix.	86	Non- ad hoc
(g) The rule of Adjective Compounding adjoins nouns to adjectives, irrespective of the internal structure of the adjectives.	92	Ad hoc

Only two of the seven strategies which Allen employs in defence of the EOH have been found to be non-ad hoc. A question that has not yet been raised is whether protection as such is an objectionable way of reacting to criticism brought against a hypothesis. According to Botha (1981a:

417), the protection of a criticized hypothesis need not necessarily be objectionable. According to him (1981a:413-417), protection of a hypothesis by means of ad hoc auxiliary hypotheses is objectionable, whereas protection of a hypothesis by means of non-ad hoc auxiliary hypothesis is not. An auxiliary hypothesis is ad hoc if (i) its sole function is to protect another hypothesis from refutation and (ii) it has no independent test implications, i.e. it is in principle irrefutable.⁵³⁾ Except for (c) and (f), the protective devices in (72) above have all been shown to be ad hoc. Their sole purpose is to render potential counterexamples compatible with the EOH. The protective devices (72)(a), (b), (d), (e) and (g) should therefore be regarded as objectionable and, hence, unacceptable measures of protection. Consequently, we have to conclude that quite a number of real counterexamples to the EOH remain unaccounted for. Note that the fact that Allen chooses protection as a means of reacting to criticism brought against the EOH is not objectionable in itself. The problems which we have noted in connection with the devices (72)(a), (b), (d), (e) and (g) arise from the content of Allen's arguments in each case.

It was noted in §2 that Allen (1978) is not very explicit about the status of the EOH. It is therefore difficult to make judgments about the success of this hypothesis. Suppose, for argument's sake, that the EOH was conceived as a rule-independent, but language-specific principle of English morphology. Then the fact that a considerable number of English forms remain unaccounted for by the EOH, bears negatively on this hypothesis. It must be concluded, therefore, that the EOH does not entirely succeed as a principle for explaining the formation of compounds and derivatives in English. It follows then, that Allen's (1978:196) claim that it is "a general ordering principle of morphology which drastically limits the number of possible combinations of prefixes and suffixes", is highly questionable.

NOTES

*This paper is based on part of an M.A. thesis, which was presented at the University of Stellenbosch in 1982. It was written under the supervision of Prof. R.P. Botha.

1. Cf. T.C. Botha 1982 for a detailed discussion of the consequences of the EOH.
2. Allen (1978) uses the term "level" instead of "class" in order to capture the fact that the morphology is partitioned into blocks of rules, each block having different morphological characteristics. In her discussion of the EOH, Allen does not give much attention to the second part of the EOH, viz. that "the assignment of external word-boundaries to lexical items is ordered after affixation rules but before compounding" (1978:83). Apart from one paragraph in which she (1978:126-128) comments on the assignment of external word-boundaries, Allen is mostly concerned with the appearance of affixes outside compounds. In the present study, no attention will be given to the assignment of external word-boundaries.
3. Note that Allen (1978) uses the expression "Extended Ordering Hypothesis" in an ambiguous way. She uses the expression "the EOH" not only to denote an "extension" of the Ordering Hypothesis, but also to denote a hypothesis which in fact includes the Ordering Hypothesis. The ambiguity arises from Allen's use of the term "extended". Cf. T.C. Botha 1982:2-4 for a more detailed discussion of Allen's ambiguous use of the expression "the EOH". I will assume that the EOH expresses only one claim, viz. that the Level III rules, including the compounding rules, follow all Level I and Level II affixation rules.
4. In all the quotations the emphasis is mine.

5. The emphasis is mine.
6. For a more detailed discussion of Allen's Overgenerating Morphology, cf. Allen 1978:§4.2.2.
7. According to Allen (1978:196), the interaction of word formation rules can also be blocked by adopting rule-specific conditions. Such conditions include (i) the condition which limits *un-* Prefixation to adjectives and (ii) the condition which limits suffixation by verb forming *-en* to monosyllabic adjectives.
8. Allen (1978:213, 231, etc.) repeatedly refers to "Level III formed compounds" or "Level III derived compounds". This implies that compounds may also be formed on levels of word formation other than Level III. However, this is not implied by Allen's EOH. In order to avoid this ambiguity, I will refer to "compounds which are formed at Level III", or just "compounds".
9. Cf. Allen 1978:213-214 for further discussion of the interaction between an Overgenerating Morphology and the EOH.
10. This prediction will be discussed in detail in §4.
11. Allen (1978:216) refers to rules that apply in the environment of a word-boundary as "*#* rules". The rules of R-syllabification, G-drop and I-tensing would be *#* rules, for example.
12. (Selkirk 1978) is an unpublished manuscript which represents a part of (Selkirk in preparation). Selkirk has since changed some of the views expressed in (Selkirk 1978). Allen's (1978) references to (Selkirk in preparation) are in fact references to (Selkirk 1978). Thus, although Selkirk has changed some of her views, Allen's remarks will be judged against the background of (Selkirk 1978).
13. Selkirk (1978:23-24) presents evidence from two phonological processes in support of this conclusion, viz. from G-drop and from R-syllabification.

14. According to Selkirk (1978:11), the stem is "a structural unit in and of itself". Compounds, for example, would be regarded as being composed of stems. Neutral affixes are adjuncts to stems. By contrast, non-neutral affixes are adjuncts to roots. According to her (1978:14-15), a stem immediately and exhaustively dominates a root.
15. Selkirk has recently changed her views about the nature of the constituents of compounds. In (Selkirk 1981:271), compounds are regarded as being composed of words, and not of stems.
16. According to Allen (1978:22), "the suffixes ... *-like*, ... *-ly*, ... *-y* have all been generally accepted as associated in some way with a word-boundary, the major evidence being that these suffixes affect neither the stress nor the segmental composition of the words to which they attach".
17. Recall that Selkirk (1978) distinguishes between neutral (# boundary) and non-neutral (+boundary) affixes which attach to stems and roots respectively. Within her theory, there is nothing which prevents neutral affixes from attaching to compounds.
18. Cf. Botha 1978:5-6 for a discussion of apparent/potential counterexamples and the difference between apparent and actual/real counterexamples.
19. The seven ways of reacting to criticism which Botha (1981a:408-409) lists, are (i) indifference, (ii) reasoned apathy, (iii) counter-criticism, (iv) protection, (v) modification, (vi) replacement and (vii) revolution. One respect in which the various ways of reacting differ from one another, concerns the question of how drastic an effect each type of reaction has.
20. Cf. Botha 1981a:414-417 for a discussion of ad hoc and non-ad hoc auxiliary hypotheses.
21. Cf. (3) in §1 for an explication of the ordering claims of Allen's morphological theory.

22. Cf. Selkirk 1978:21 for these examples. The bracketing in the presentation of the words in (21) and (23) is that of Selkirk.
23. Cf. Allen 1978:224, 225 for these examples.
24. In a note, Allen (1978:289) briefly considers the problem of an adequate description of the nature of the interaction of prefixation with compounds formed by back-formation. This note, note 19, is omitted from the quotation given here.
25. The rule of compound verb formation adjoins verbs and nouns to form compound verbs.
26. Exactly how prefixation applies in these cases is not clear. In note 19 of Chapter 4, Allen (1978:289) rejects the possibility of an account similar to the one proposed for stretchable suffixes. According to her, the correct account will possibly be that items in the Permanent Lexicon are subject to boundary weakening, which will permit external prefixation by Level II # boundary prefixes. Cf. Allen 1978:236ff. and §4.3.3 of this study for a discussion of the notion "stretchable suffixation".
27. According to the Webster's Third International Dictionary (1961:46), *to air-condition* means "to equip with an apparatus for washing, humidifying, de-humidifying and controlling the temperature of air". The verb *to condition* on the other hand (1961:473), has the meaning "to put into the proper or desired condition".
28. I will refer to the Websters's Third International Dictionary as Webster's for short.
29. Marchand (1969) uses the term "back-derivation" instead of "back-formation". However, he (1969:3) apparently regards the two terms as synonyms, as the term "back-formation" appears in parentheses after "back-derivation".
30. Allen (1978:236) presents the following evidence in support of the

hypothesis that $-ful_1$ does not attach to compounds:

<i>worshipful</i>	*[<i>sun-worship</i>] <i>ful</i>
<i>careful</i>	*[<i>child-care</i>] <i>ful</i>
<i>restful</i>	*[<i>bed-rest</i>] <i>ful</i>
<i>lawful</i>	*[<i>jungle-law</i>] <i>ful</i>
<i>healthful</i>	*[<i>infant-health</i>] <i>ful</i>
<i>masterful</i>	*[<i>house-master</i>] <i>ful</i>
<i>thoughtful</i>	*[<i>dream-thought</i>] <i>ful</i>
<i>beautiful</i>	*[<i>animal-beauty</i>] <i>ful</i>

31. Cf. also Marchand 1969:291-292 for this distinction.
32. Cf. Nida 1946:89 n. 21 for this note.
33. Cf. Nida 1946:82 for this statement.
34. Note, incidentally, that Marchand (1969:324, 325) does not draw a distinction between two instances of *less*, as he does in the case of *ful*. He mentions only the *less* found in words such as *careless*, *endless*, *headless*, etc. According to him (1969:324), "combinations with *-less* are suffixal words. The suffix is primarily used with substantival bases, conveying the privative meaning 'without, free from ____'". He also notes that the suffix *-less* is pronounced [lis] or [læs]. The possibility that it can be pronounced [lɛs], is not mentioned.
35. According to Allen (1978:237), the only possible bracketing for these cases is one in which the suffix appears outside the phrase. The suffix cannot be attached to the final conjunct, e.g. *[*black*] and [*blueness*]_N, since constituents of different syntactic categories cannot be conjoined.
36. This example, together with the form *hard-hearted*, is presented by Selkirk (1978:21). The type of morphologically complex word to which *hard-hearted* belongs, will be discussed later.
37. Selkirk (1978:21) analyzes *hard-hearted* as [[*hard heart*] *ed*].

38. Note that there is a problem with Allen's formulation. A particular type of compound cannot form a "subset" of a "more general adjective compounding process". Rather, a given type of compound can form a subset of the products of a more general adjective compounding process.
39. An example of such a general principle is the Morphological Island Constraint proposed by Botha (1981b:46):
- "The individual constituents of the complex words formed by means of WFRs lose the ability to interact with inflectional, derivational and syntactic processes."
- The Morphological Island Constraint will not be discussed in any more detail. Cf. Botha 1981b:45-55 and Savini in preparation for a more detailed discussion of this constraint.
40. Recall that Allen (1978:246-248) treats these examples as N-A compounds with the morphological structure $[[\dots]_N [[\dots]_N^{-ed}]_A]_A$.
41. Cf. Jespersen 1946:325 for the last two examples.
42. Cf. Jespersen 1946:336 for the last three examples.
43. Cf. Jespersen 1946:460 for the last three examples.
44. Cf. Jespersen 1946:462 for this example.
45. Note that Allen would not regard the examples in (66)(a) as problematic for the EOH. Recall that she regards *-ness* as a "stretchable suffix", and that she analyzes complex adjectives ending in *-ed* as compounds with an *-ed* adjective as second constituent. However, in §§4.3.3 and 4.3.4 it was argued that Allen's analyses cannot be accepted.
46. According to Adams (1973:33), a complex word such as *unadventurousness* may be "broken down" in the following way: *unadventurous* and *-ness*; *un-* and *adventurous*; *adventure* and *-ous*. Formations

which cannot be "broken down" like this, are called "parasynthetic". The form *intramuscular*, according to her (1973:33-34), is parasynthetic. If the suffix is subtracted, there is no word *intramuscle*. She notes that "we may here think of the prefix and the suffix as being added 'simultaneously' to the stem". She regards *milk shake* as a parasynthetic compound, since the noun *shake* is not used in this sense outside the compound.

47. Levi (1977:325; 1978:1) uses the one term "complex nominal" to denote the following types of nominals:

- (i) nonpredicating/nominal adjectives, e.g. *planetary core*;
- (ii) compound nouns/nominal compounds, e.g. *apple core*;
- (iii) nominalizations, e.g. *urban planning*.

She (1977:325; 1978:6) claims that all complex nominals are transformationally derived by means of two syntactic processes: predicate deletion and predicate nominalization.

48. Levi (1977:328) mistakenly notes that "the full CN quantum mechanic" combines with the agentive suffix. This should presumably read "the full CN quantum mechanic" combines with the agentive suffix, *-ian*.

49. The emphasis is Levi's.

50. Note that the examples in (68) constitute potential counterexamples to Allen's EOH. Allen does not consider a reanalysis of potential counterexamples to the EOH involving the agentive suffixes *-ian* and *-ist*.

51. The bracketing in (70) is that of Selkirk (1978:21).

52. Selkirk (1981:270-271) presents the evidence in (69) to support her argument that the category type involved in the formation of native compounds is that of word. According to her, the notion of 'category level' is important in describing the distribution of derivational affixes in English. For every affix, the level of the category to

which it adjoins must be specified. Because derivational affixes may attach to either compound nouns or single nouns within her theory, these structures are of the same level. Therefore, the category type word is the one involved in compounding.

53. Cf. also Sinclair 1977:26 and Botha 1978:19 for a discussion of objectionable and non-objectionable protection.

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