A Morphosyntactic Explanation for the Mirror Principle

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The Mirror Principle of Baker (1985) encodes the observation that the order in which affixes appear coincides with the order of application for rules triggered by the affixes. Baker quite rightly points out that this generalization requires explanation and that it is incompatible with many otherwise reasonable theories of grammatical organization. I will assume here that the Mirror Principle is empirically correct. I will show that it is not explained by putting morphology and morphology-related syntax into a single "component," as Baker suggests. Instead, it can be explained in terms of the theory of word structure and the notion "head."

Baker’s argument is based primarily on Chamorro *man-/fan-* agreement, Quechua causativization and reflexivization, and cross-linguistic characteristics of passive and applicative. The Chamorro examples in (1) (from Baker (1985, 388)) are among the cases he cites in support of the Mirror Principle.

(1) a. Para#u#fan-s-in-aolak i famagu’un gi as tata-n-niha. 
   irr-3pS-pl-pass-spank the children obl father-their
   ‘The children are going to be spanked by their father.’

b. Hu#na’-fan-otchu siha.
   1sS-caus-pl-eat them
   ‘I made them eat.’

*fan-* occurs only with a plural subject. In (1a), which has the form *fan-passive-stem*, prefixation of *fan-* follows prefixation of the passive morpheme. Here *fan-* agrees with the derived subject. In (1b), which has the form *causative-fan-stem*, prefixation of *fan-* precedes prefixation of the causative morpheme. Here *fan-* agrees with the subject prior

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to causativization. Baker concludes that the order of *fan*-affixation and the order of agreement checking are always identical: both precede causativization and follow passivization. The order of the affixes is a direct reflection of the order of application of the morphosyntactic rules involved in agreement, passivization, and causativization.

Affixation processes and the syntax-affecting operations they are associated with (which Baker calls "GF-syntax" and I will refer to as "morphosyntax") are separated in many models of grammar. If a theory confines all affixation to the lexicon and posits a separate block of rules subsuming morphosyntactic operations, the Mirror Principle cannot be explained.

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\begin{array}{c}
\text{LEXICON (Affixation)} \\
(2) \quad \rightarrow \\
\text{MORPHOSYNTAX}
\end{array}
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In such a system there are two unrelated derivations and there is no reason to expect any particular relationship between them. Chamorro *fan-* will be added in the lexicon, as will the passive and causative affixes. The morphosyntactic operations associated with each affix will be carried out in a separate syntactic or morphosyntactic derivation. In principle, then, it is quite possible for *fan-* to be added after the passive morpheme, but for plural marking to be checked before the morphosyntactic promotion of the object to subject has taken place.

Of course, a relationship between the two derivations can always be stipulated: we could assign each affix and paired morphosyntactic operation a number and then impose a constraint on derivations requiring a match between the sequence of numbers representing the morphological derivation and the sequence representing the morphosyntactic derivation. The problem is that there are many a priori equally good theories, including one in which the order of numbers and thus applications must be reversed in the second derivation (following a mirror-image principle).

The solution suggested in Baker (1985) is to put the morphological and syntactic operations into a single component:

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> ... the observed parallelism between morphological derivations and syntactic derivations is a trivial consequence of the fact that there is only one derivation with both kinds of effects. ... To unify morphology and GF-rule syntax and thus account for the Mirror Principle, we must now claim that only one component is involved. (p. 408)

However, the Mirror Principle does not follow from a model with this property either. In a lexicalist version all the operations of interest might be taken to affect the lexical entries of verbs, adding affixes and changing argument structure and grammatical relations. All the operations will then be in a single "component." Nevertheless, nothing prevents affixation and the associated morphosyntactic changes from being ordered separately, with other rules intervening between them. In a syntactic version (approximately the model assumed by Baker) both affixation and the morphosyntactic rules might take
place in the syntax; but again the Mirror Principle does not follow, and for the same reason. Other operations could intervene between the affixation and the changes in syntactic structure.

Locating all the operations in a single derivation only means that affixation and morphosyntactic operations can be ordered together; it does not mean that they must be. The Mirror Principle will not follow unless the model is bolstered by the assumption that all the effects of the affixation (morphological and morphosyntactic) must necessarily be ordered together—yet this is exactly what we are trying to explain. Baker’s explanation fails because it posits no intrinsic relation between the morphological and morphosyntactic operations. The problem can only be resolved in a theory in which they are intrinsically linked in some way, so that the ordering of one automatically is the ordering of the other.

I would like to suggest that the linked ordering of affixation and morphosyntax follows from the theory of word structure and in particular the theory of heads. Williams (1981) first proposed that an affix can become the head of the word it is added to. In a sequence of affixes, then, the last added affix is the head. (See Selkirk (1982) for discussion, and Lieber (1980) for a rather different approach.) According to the theory of heads, only the properties of the head of the word are properties of the word itself. Only properties of the word are accessible to further morphological or syntactic analysis. (This is a consequence of the “Atom Condition” of Williams (1981).) Thus, the head of the word, and nothing else, can trigger changes in the argument structure, case structure, or subcategorization of a word, or can otherwise affect the syntactic configuration the word appears in.

From these assumptions we can derive the Mirror Principle. Any operations associated with an affix must be applied at the point in the derivation where the affix is the head. The affix cannot possibly count as a head until it has been added, and any later affixation will demote the affix of interest from its head status, rendering it hors de combat. The morphosyntactic operations triggered by a morpheme therefore cannot take place before the morpheme has been affixed, or after another morpheme has been added, but must take place at the same point as affixation of the triggering morpheme. This is the content of the Mirror Principle.

Let us see how this applies in example (1). The lexical entry of fan- specifies that it marks the subject as plural. This agreement marking or checking can occur only while fan- is the head of the verb. fan- is head after passivization in (1a), and it therefore marks the derived subject as plural, and not the prepassivization subject. In (1b) fan- is the head of huna’fanotchfitu before causativization by na’ and not after, and it therefore marks as plural the subject of the internal predicate, and not the subject of the entire causative.

An interesting point about this explanation for the Mirror Principle arises with re-
spect to zero derivation. If a rule that adds no overt affix leaves the head structure of
the word unchanged, the rule could in principle intervene between affixation of a mor-
pheme and the associated morphosyntactic operations. Since the triggering morpheme
would remain the head, no violation of the theory would be involved. Any number of
zero-derivation processes could separate the affixation and the operations triggered by
the affixation. The correct conclusion seems to be that the head structure of the word
is not left unchanged by such operations. There are a number of possibilities: a zero
affix could be added and become the new head, or the new word might be exocentric.
Provided that the original affix does not remain the head, the desired result can be
achieved. 3

To sum up so far, I have suggested that the Mirror Principle is a consequence of
the interaction between affixation and morphosyntax, on the one hand, and the theory
of heads, on the other. Affixes trigger operations specified in their lexical entries, but
only when they are in head position. What does all this imply for the organization of
the grammar? Affixation and morphosyntax must take place in a single derivation and
not in two separate derivations as in (2). This is necessary if they are to be ordered
together. Does this mean that they are in the same component, as Baker argues? The
assumption behind Baker’s claim is that if two processes have the same ordering, they
are part of the same component. However, there are two senses of “component”:

(i) A set of rules or representations defined over a certain vocabulary and governed
by principles of a particular type. A component in this sense is a domain of the
theory.

(ii) A set of rules/operations that act as a block in the organization of the grammar.

(ii) is a particular theory of how components in the sense of (i) interact. The Mirror
Principle shows that affixation and morphosyntax belong to the same component in the
sense of (ii). However, they can still belong to different domains, or “components” in
the sense of (i). This situation is completely consistent with the Mirror Principle.

In the case at hand the first domain is morphology, a set of rules and the principles
that govern them, defined over the vocabulary of categories of level X 0 or below. The
second domain is morphosyntax, the syntax-related operations that can be triggered by
an affix. The vocabulary of this domain includes argument, grammatical function, and
case and agreement features. Attachment of an affix is subject to the theory of mor-
phology, and any morphosyntactic operations specified in the lexical entry for the affix
are subject to the second theory. Both kinds of operation apply in a single derivation,
but they still belong to two different theoretical domains.

We can see this in a familiar example like the English passive. -en is affixed to a
Verb (a morphological operation) and triggers morphosyntactic changes in the Verb’s

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3 Edwin Williams has pointed out to me that zero-derivation frequently changes syntactic category: walk
(N/V), bat (N/V), etc. In such cases the former head cannot still have its head status (otherwise, no category
change would ever be possible), so category-changing rules that add no overt affix support the idea that zero-
derivation alters head structure.
case/subcategorization properties. Both operations must occur at the same point, but they are governed by different theories nonetheless.

The Mirror Principle does not show that morphology and morphology-related syntax are the "same thing." It does show that morhosyntax and affixation are intrinsically connected—two aspects of a single derivation or component in the sense of (ii). With this assumption, the Mirror Principle follows from the theory of word structure and heads.

References


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