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# Morphological productivity: Its importance for the English language teacher

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## Abstract

*For the theoretical linguist, productivity (the extent to which a particular affix can be used to create previously unknown forms) is a major descriptive problem (Bauer, 2001). For the language teacher, the awkward theoretical problems need not cause difficulties, but a distinction does need to be drawn between unproductive, slightly productive and extremely productive affixes if students are to be given the maximal possible support in using morphology to help understand and learn new words. Knowing about morphology is important at any stage of learning a language; but the pedagogical implications of morphological structure are not the same at all levels of language learning, and productivity is one of the factors teachers need to bear in mind in planning their curricula.*

*Keywords*: morphology, productivity, English language

## What is productivity?

One of the key concepts in morphology for the theorist is productivity, usually defined as the extent to which a morphological process (such as the affixation of *-ation*) can be used to create new words (for extensive discussion of productivity, see Bauer, 2001). While this definition is sufficient for present purposes, it hides a host of problems – as does any theoretical concept when considered critically. One of the main problems with productivity is that, as is pointed out by the French morphologist Danielle Corbin (e.g. Corbin, 1987), it conceals two contrasting notions. First there is the question of whether the morphological process is available (French *disponible*), that is, can you make new words using it at all? Second there is the question of whether the process is profitable (French *rentable*), that is, how many words can be made using this process if we know it to be available?

It might be thought that the two would be equivalent: if new words can be made using a particular process, as many of them can be made as are needed. To some

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extent that is true, though it must be remembered that new words are not always made with the same affix. But when we look at the results of past productivity, the two may differ considerably. Consider the suffix *-ric* in *bishopric*. There are only two words that use this suffix in English (the other being *arch-bishopric*), so that although at some stage it must have been available, it has never been particularly profitable. It is almost certainly not available anymore: you cannot invent **priestric* or **cardinalric* unless it is some kind of joke. By contrast, the suffix *-th* which forms nouns like *warmth*, which like *-ric* is no longer available – we cannot invent **blueth* (and *coolth* has been around since the seventeenth century) – nevertheless has created a series of words which persist in modern English. You may not be able to think of very many, and you may even be in doubt as to whether *month* or *filth* are members of the class, but you can probably think of a dozen or so words which contain this affix (e.g., *depth*, *strength*, *truth*, *growth*, *health*, *ruth*…). If we now consider the suffix *-ment*, which we find in *agreement*, for example, there is dispute as to whether this suffix is still available or not (Bauer et al., 2013). Occasional unfamiliar forms such as *Englishment* are found (*Anglicisation* is more common), but they do not sound serious. But if we look for such words in dictionaries, we will find hundreds or examples, so frequency and productivity are not the same thing.

For the sake of clarity, it should probably be pointed out that we are talking here about type frequency, that is the number of different words that are found created by the relevant process. Such measurements do not involve token frequency, that is the number of times that we find *warmth* in any large sample of English writing as opposed to the number of times we find *filth* in the same sample (where *warmth* is likely to have a higher token frequency than *filth* has).

## Why do language teachers need morphology?

Let us begin with a simple example, the verb *prevent*. We need students to recognise the same word *prevent* in any of the sentences in (1), despite the fact that the actual form *prevent* occurs only once in (1).

1. Vitamin C can prevent a cold.
   Her father prevents her from going to pubs.
   Digging the ditch prevented a direct attack.
   Paying the fine may have prevented him from going to prison.
   Your attitude is preventing progress.

Moreover, we want students to recognise a pattern here, so that we do not have to teach a parallel set of forms for *contain*, *expect*, *incur*, *remind*, *want* and so on for hundreds of forms. It might seem that the problem in English is relatively restricted and not worth bothering about: in French we might have to teach hundreds of forms for each verb, in Hungarian or Turkish that figure might be in the thousands. Nonetheless, the saving of time and energy that arises from teaching the general pattern makes it worthwhile not to teach each form of every single verb independently. Of course, things are not always quite so simple: *take* has two different forms (*took* and *taken*) where *prevent* has only one; some verbs do not have a continuous form with *-ing* (*know*, for instance – although there is a word *knowing*: *a knowing look*; *knowing what I do*). The general principle still holds.

The same is true with instances where the paradigms are less extensive (or, to phrase it differently, where the morphological processes are less profitable, usually because they involve derivation not inflection). Students who can recognise the *-er* on the end of *propeller* and the *-ation* on the end of *rationalisation* can recognise the bases more easily than those who do not see the pattern. Recognising the base means that the students are more exposed to the vocabulary item more often (so getting more repetitions of it to help memory and understanding), they get more clues about the word-class (or part of speech) of unknown words, and they are put in the position of being able to make educated guesses about what a new word might mean (Bauer & Nation, 2020, pp. 5–7). All this helps guessing about meanings, remembering vocabulary and understanding the structure of the word they are dealing with. The more proficient students are in using these clues, the better learners they become.

## The extra benefits of highly profitable processes

The most highly profitable of the processes that are available have extra benefits: they allow students to fill gaps in their vocabulary. All students come across instances where they do not have a word for a concept they want to express. If that concept can be filled by an available and highly profitable process and the student is aware of the profitability of the process, they can invent words to fill the slot. The word they invent may not be the ordinary English word for the concept, but it is likely to be comprehensible. Say, for example, that the student does not know the word for a machine that makes holes in wood, but they know either the word *to drill* or *to bore*, they can invent *driller* or *borer*. The fact that the standard word is *drill* and that *driller* in standard English denotes a person, and that *borer* (at least in New Zealand) means a beetle is unlikely to hinder communication in context. A student who wants the word *ugly*, but only knows the word *pretty*, can safely invent *unpretty* and be

understood. This strategy is not necessarily optimal in formal examinations, but for communication on the ground, it is invaluable.

Inflectional affixes must be taught in this way; teachers have more room for personal judgement over which derivational affixes should be taught the same way, but at least the processes in Table 1 are good candidates. Others might be added to the list if classroom experience shows a need for them (Bauer & Nation, 2020, p. 11 give a slightly longer list).

**Table 1. Some highly productive affixes in English**

| Affix | Example | Comment |
|---|---|---|
| -able | justifiable, doable | added to transitive verbs |
| -ation | industrialisation, justification | only when added to verbs that end in *-ise* or in *-ify* |
| -er | driver, mixer | creates agents and instruments |
| -ly | happily | makes manner adverbs from adjectives |
| -ness | happiness | makes nouns from adjectives |
| -y | stoney | makes adjectives from nouns; can sound child-like if overused |
| non- | non-human | divides the world into two classes, those covered by the base and the rest |
| un- | unhappy | makes the negative of adjectives |

The second danger to be considered here is that once students start looking for affixes inside words, they find them even in places where they do not exist. For example, a *rotor* is not a thing that rots, you do not *ham* with a *hammer*, *tarnish* does not mean 'like a tarn', *story* does not mean 'like a store', *precarious* does not mean that something will soon be *carious*, to *discern* something is not the opposite of *cerning* it, and so on. Distinguishing between real affixes and the spellings here often demands quite a large vocabulary.

## Productivity versus frequency

One of the problems facing the teacher is that the patterns which are found in the most frequent vocabulary are not necessarily the patterns that are productive. Students who seek morphological patterns are thus likely to find examples which are not going to help them in their quest for support in vocabulary learning. It might be argued that this does not matter, since at the point when students are learning the most frequent vocabulary, they are not in a position to deduce morphological

patterns, and each word has to be learnt as an individual item anyway. This argument has some merit. We must also remember that words which show up as being frequent in corpora are not always the ones which are taught first. But because common words are likely to be the places where students start to see morphological patterns, they remain as a basis for trying to deduce the structure and meaning of rarer words.

In order to illustrate the extent of the problem, a small experiment was carried out using a corpus of word-frequencies from the Corpus of Contemporary American English and the British National Corpus prepared by my colleague, Paul Nation. From this corpus, the most frequent 20 words formed with a transparent affix (compounds like *anything*, *understand* were ignored for this exercise) were considered in two word-classes: adjective and noun. There were only two relevant verbs in the most frequent 1000 words in the corpus: *discover* and *realise*, neither of which is particularly transparent from the semantic point of view. The 20 most frequent affixed adjectives are listed in Table 2, with their rank in the 1000 words. The 20 most frequent nouns are listed in Table 3.

**Table 2. The 20 most frequent morphologically complex adjectives in an English corpus**

| Rank | Word | Comment |
|---|---|---|
| 176 | American | Productive use of *-an* |
| 232 | national | Non-transparent phonology of the base |
| 238 | different | Semantics of the formation obscure; suffix marginally productive |
| 267 | important | Semantics awkward; suffix marginally productive |
| 278 | political | Some productivity |
| 454 | economic | Some productivity |
| 501 | international | See national above |
| 550 | easy | The suffix is productive, but the meaning link is not clear |
| 581 | personal | Some productivity, but semantic link not clear |
| 623 | available | Productive suffix, but the base is rare |
| 625 | likely | Suffix not usually productive on such bases |
| 647 | medical | Some productivity |
| 716 | natural | Suffix has some productivity, but phonology of the base is unpredictable |
| 720 | significant | Suffix of marginal productivity |
| 743 | central | Some productivity |
| 804 | physical | Some productivity |

| | | |
|---|---|---|
| 806 | general | Suffix has some productivity, but base is obscure |
| 822 | environmental | Some productivity |
| 830 | financial | Some productivity, but the -i- is unpredictable |
| 887 | religious | Some productivity |

**Table 3. The 20 most frequent morphologically complex nouns in an English corpus**

| Rank | Word | Comment |
|---|---|---|
| 201 | government | Suffix of disputed productivity, but low |
| 247 | business | Semantics of original base is lost |
| 297 | community | Base is rare than this word |
| 304 | president | Suffix of marginal productivity |
| 315 | information | Suffix not productive on this base-type |
| 345 | health | Suffix not productive, phonology masks the nature of the base |
| 372 | teacher | Transparent formation |
| 377 | education | Suffix probably no longer productive |
| 449 | development | Suffix of disputed productivity, but low |
| 487 | relationship | Transparent formation, but not a freely productive suffix |
| 497 | difference | Suffix of marginal productivity |
| 503 | action | Suffix not productive one this base-type |
| 538 | activity | Transparent formation, but suffix is mainly learned or technical |
| 549 | situation | Suffix probably no longer productive |
| 574 | worker | Transparent formation |
| 577 | movie | Suffix not normally used on verbs |
| 590 | computer | Transparent formation |
| 595 | Republican | Semantics obscure |
| 600 | organisation | Formation is regular, but semantics is specialised |
| 626 | opportunity | Much more common than its base, with awkward semantic link |

It will be clear that the nature of the corpus has influenced the actual words that are listed here (having *Republican* as a frequent noun suggests the corpus contains American texts on politics, for instance), but the precise words listed are not really the point. What is relevant is how few of these words are really good models for forming or understanding new words on the basis of their morphology. This requires some planning on the part of the teacher.

- First, the distinction between productivity and type frequency is crucial. What is productive may not be frequent, and what is frequent may not be productive. The two have to be treated differently in the class-room. Unproductive morphology is useful only for interpreting input, productive morphology may be useful for creating meaning, too.
- Consideration must be given to the information that can be gleaned from such adjectives and nouns. While something that is frequent but not productive may provide information on word-class, it will often provide minimal information on the precise meaning of the word. Something that is productive is likely to give far more information on the meaning of the word: a word ending in *-able* will always have a modal interpretation, for example.
- Practice has to be provided in guessing meaning from clues including morphology, but also including the context in which the word is met. The more of the context that is understood, the easier it will be to guess the meaning of any new word. Even someone who knows that *-er* typically means 'person or thing which performs the action of the verb' must be able to realise that in *I've booked us on the sleeper from London to Inverness*, *sleeper* is not likely to reflect that meaning.

In order to gain the benefit from such insights as are available here, flexibility and practice are required. The suffixes *-an*, *-ant*, *-ent*, for instance can show adjectives or nouns; *-er* regularly marks nouns, but a homophonous form also found on comparative adjectives like *bigger*; *-ate* can occur on verbs (*abdicate*), adjectives (*intricate*), nouns (*certificate*) – although the pronunciation is not the same in all these cases. Although *-er* may often mark agents and instruments, it does not do so in *conquer*, *ever*, *fever*, *proper*, and other clues may give information on the word-classes involved in such examples, and thus indicate that the agentive or instrumental reading is not relevant.

Teachers can provide practice in interpreting morphological elements by glossing the form in terms of its elements as well as in terms of what it actually means: 'a *diner* can be a person who dines, but here it means a place where one dines, specifically …'; 'the word *carriage* comes from *carry*, but here it means specifically a vehicle which carries people on a train'.

Finally, it should be clear that morphology has different uses at different stages in the learning process. For beginning students, learning to deal with inflection is paramount; the ability to gain information from unproductive patterns in *-al*, or *-ion* comes only once sufficient forms with these patterns have been learnt. The added value from highly productive patterns comes much later. Morphology can be useful for any learner, but how it is introduced requires thought.

## Conclusion

Learners have to cope with the morphology of the language they are learning, just as they have to cope with syntax and matters of pronunciation and spelling. Not all morphology can be made useful in the same way: some is needed at early stages of learning, some is more useful at advanced stages. But when thinking about what to teach from a morphological point of view, the matter of productivity has to be taken into account. The most productive morphology is easiest to deal with, and provides most information (though not all the required information). However, there is so much morphology that is not productive, that it is impossible to rely on productive morphology alone. Productive and unproductive morphology have to be built into the curriculum in different ways, and the limits of each have to be understood by the teacher as well as the learner.

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