Morphology versus syntax: Investigating the cognitive nature of complex items in different languages

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Introduction

Does morphology represent a separate grammatical domain distinct from syntax?

>e.g. Di Sciullo & Williams (1987); Bisetto & Scalise (1999)

What can adjective-noun/noun-adjective constructions tell us about the distinction between morphology and syntax? Do reliable criteria exist to distinguish compounds from phrases?
What about inflection, stress and spelling?

German: Rothirsch (‘red_deer’, a special kind of deer) versus roter Hirsch (‘red deer’, any deer that is red) → the criteria work well

French: cerf rouge (‘deer red’, a special kind of deer) versus cerf rouge (‘deer red’, any deer that is red) → the criteria do not work

English: red DEER (a special kind of deer; but: BLACKbird) versus red DEER (any deer that is red) → the criteria do not work

We see that structural criteria (e.g. inflection, stress, spelling) are not reliable to distinguish compounds from phrases in two of these languages (Van Goethem 2009).
What do we know about the cognitive nature of compounds and phrases?

Kotowski, Böer & Härtl (2014) found stronger memorization effects for German AN compounds in comparison to German AN phrases.
Combining the lack of reliability of structural criteria in English and French with the cognitive evidence for German leads us to the goal of the current paper:

Does the cognitive nature of adjective-noun/noun-adjective constructions differ in German, English and French?
It is assumed that German prefers a morphological route (compounds) to create new complex lexical concepts (Bücking 2010; Hüning 2010), whereas French favors a syntactic route (phrases) for this purpose (Van Goethem 2009). English might be “located” between German and French, in that it might be prone to use both routes (cf. Carstairs-McCarthy 2005 for a view on English compounding as neither morphological nor syntactic).

Assuming that a German item like *Blaumotor* is a compound, what is the grammatical nature of its possible translation equivalents in English (*blue motor*) and French (*moteur bleu*)?
Native speakers of German, English and French participated in a memorization experiment on three days (day 1, day 4, day 8)

Four groups: German (9 subjects), English A (9 subjects, AN constructions with initial stress), English B (9 subjects, AN constructions with non-initial stress), French (8 subjects)

On each day: memorization phase (MP) and recall phase (RP)

MP: Memorization of novel/non-lexicalized complex items (AN for German and English, AN or NA for French, e.g. Blaumotor/blue motor/moteur bleu) and, as a baseline, real nouns (e.g. Architekt/architect/architecte) of their respective native language (same items on each day)

RP: Lexical-decision paradigm, response “yes” to items that subjects heard in the MP and response “no” to items that they did not hear in the MP
Experimental study: Main hypotheses

No significant difference should occur between the real nouns across languages (baseline).

Significant differences should be found between the complex AN constructions across languages.
Experimental study: Selected results

- 4 x 2 x 3 repeated-measures ANOVAs for RESPONSE TIME for subjects ($F_1$) and items ($F_2$) (only memorized items, only correct answers, without outliers)

- Independent variables: LANGUAGE (English A, English B, French, German), ITEM TYPE (complex, real nouns), DAY (1, 2, 3)

- Interaction LANGUAGE x ITEM TYPE x DAY not significant ($p > .05$)

- Interaction LANGUAGE x ITEM TYPE significant ($p < .01$ ($F_1$), $p < .001$ ($F_2$))
  - Post-hoc tests $F_2$
    - No significant difference between the German and French real nouns ($p > .05$), no significant difference between the real nouns of the groups English A and English B ($p > .05$)
    - Significant difference between the German and French complex items ($p < .05$), significant difference between the complex items of English A and English B ($p < .05$)
Experimental study: Selected results

- Interaction LANGUAGE x ITEM TYPE significant ($p < .01 \ (F_1), \ p < .001 \ (F_2)$)
  - Post-hoc tests $F_2$
    - Significant difference between the complex items and the real nouns in English A, English B and French ($p < .001$)
    - No significant difference between the complex items and the real nouns in German ($p > .05$)
Figure 1: Interaction LANGUAGE x ITEM TYPE ($F_2$)
Considering the item analysis (F\textsubscript{2}) only, the German subjects responded faster than the French participants to the complex items of their respective native language. We consider this result to reflect the memorization efficiency of morphological products in comparison to syntactic phrases.

This idea is supported by the fact that only the German complex items did not significantly deviate from the real nouns of the same language (in F\textsubscript{2}). We interpret this result to be due to the “word-like” nature of the complex German AN constructions.

In English, complex items carrying initial stress took longer to respond to than complex items with non-initial stress (in F\textsubscript{2}). This result seems to contradict the first result (German versus French) because compounding in English has been connected to initial stress (Chomsky & Halle 1968; Marchand 1969).
A possible solution:

There seems to be a connection between initial stress and morphology (e.g. Chomsky & Halle 1968) and between semantic non-compositionality and morphology (e.g. Downing 1977; Bücking 2010).

Also, there seems to be a connection between initial stress and lexicalization (Bauer 2004; Giegerich 2004; 2005) and between semantic non-compositionality and lexicalization (e.g. Blank 2001; Bakken 2006).

English offers two routes, i.e. a morphological one and a syntactic one. The syntactic route typically accompanied by non-initial stress goes better with semantically compositional items, while the morphological route usually associated with initial stress goes better with semantically non-compositional items.
A possible solution:

A post-test showed that it was not hard to imagine the existence of five of the six complex English AN constructions for native speakers of English, i.e. these items seem to be semantically compositional.

In our follow-up study, we aim to investigate the effects of the interaction of stress and semantic compositionality on the memorization of complex English AN constructions.
The results support the idea that German AN constructions à la *Blaumotor* are memorized more efficiently than possible French translation equivalents due to their morphological nature.

English might be able to use both a morphological and a syntactic route. The influence of the interaction of stress and semantic compositionality on memorization remains to be investigated.
References


