CONSTRUCTIONS, PRAGMATICS, AND MODALITY

Antonio Fortin*

Abstract: This paper rejects the commonplace view that the semantics of certain modal deverbal adjectives (MDAs), which have traditionally been assumed to be non-compositional, require complex lexical or syntactic encoding (cf. e.g. Riehemann 1994 and 1998, Booij 2007 and 2010a). Instead, it shows that productive MDA formation is semantically compositional, and that the *prima facie* idiosyncratic meanings are, in fact, conversational implicatures.

Keywords: modal deverbal adjectives; compositionality; conversational implicatures; morphology-semantics interface

1. Introduction

Modal deverbal adjectives (henceforth, MDAs), exemplified by cognate German, English and Dutch adjectives in *–bar*, *–able* and *–baar*, respectively, have long been considered problematic, under the widespread assumption that their productive formation exhibits phonological, syntactic, and semantic idiosyncrasies. This paper considers a few proposed paradigmatic cases of the semantic non-compositionality of MDAs and argues that they are, in fact, compositional. The *prima facie* idiosyncrasies are shown to be conversational implicatures (henceforth, CIs) and, thus, calculable and cancellable.

MDAs are most productively derived from transitive verbs, whereby the accusative object of the verb becomes the subject of the adjective, and a possibility operator is introduced. The regular meaning of MDAs is, thus, 'can be V-ed'.

(1) English *–able*
  a. *comparable* 'can be compared'
  b. *breakable* 'can be broken'
  c. *cancellable* 'can be cancelled'

(2) German *–bar*
  a. *lesbar* read.able 'can be read'
  b. *annehmbar* accept.able 'can be accepted'
  c. *faxbar* fax.able 'can be faxed'

(3) Dutch *–baar*
  a. *stabiliseerbaar* stabilise.able 'can be stabilised'
  b. *falsifieerbaar* falsify.able 'can be falsified'
  c. *plooibaar* fold.able 'can be folded'

However, it is commonly assumed that the meanings of certain MDAs are idiosyncratic, in that they are not wholly predictable from the meaning of the verb and the suffix (cf. Aronoff 1976, Chapin 1967, Chomsky 1970, Riehemann 1994 and 1998, Booij 2010a).

* School of Arts, Languages, and Cultures, University of Manchester, antonio.fortin@manchester.ac.uk.

For example, Riehemann (1998: 54) adduces the following, as examples of the semantic non-compositionality of MDAs:

(4) a. additional aspect of meaning: *essen* 'eat' → *essbar* 'safely edible'
b. obligation instead of possibility: *zahlen* 'pay' → *zahlbar* 'payable' (as in 'payable by 1 April')
c. lexicalised in one particular sense: *halten* 'keep' → *haltbar* 'non-perishable'

It has long been noted that English MDAs also exhibit these characteristics. For example, Chapin (1967) argued that syntactically deriving MDAs from transitive verbs requires meaning-changing transformations, since the semantics of many *–able* adjectives are much more sharply restricted in meaning than simply 'can be V-ed' (e.g. *readable* ≠ 'can be read'). Chomsky (1970: 212-213) cited Chapin's findings as evidence against syntactic approaches to word formation.

According to Booij (2007: 62), only the meanings of regular MDAs, derived from transitive verbs, are compositional, following the template 'can be V-ed'. Under this view, since non-compositional words must be listed in the lexicon, MDA formation that is productive yet idiosyncratic is problematic. Lyons (1977: 529) argues that gaps in the productivity of *–able* are such that, assuming the general formula in (5)

(5) V_{tr} + able → A_z (where A_z is an arbitrarily-labelled subclass of adjectives)

there is "no single [phonological, morphological, syntactic or semantic] property or combination of properties of this kind in terms of which we can predict the applicability or non-applicability of the derivational formula". For example, even though the general process accounted for by (5) is "extremely productive", the fact that possible MDAs like *gettable* "would be rejected by perhaps the majority of English speakers" remains mysterious (Lyons 1977: 528-529). Problems like these have led several authors to propose complex means of recovering the idiosyncratic meanings of MDAs (Riehemann 1998, Booij 2010a).

I will argue that a conventional possibility meaning, roughly paraphrased as 'can be V-ed', combined with standard Gricean pragmatic principles suffices to account for the semantics of productive MDA formation, whether semantically transparent or putatively idiosyncratic[1]. Furthermore, I will show that the putatively "idiosyncratic" meanings of MDAs are, in fact, CIs which meet the standard Gricean tests.

Since my aim is to demonstrate that the semantic idiosyncrasies of MDAs are, in a sense, illusory, I will not be arguing against the specific details of any of the various theoretical proposals that have been made to account for MDAs. Instead, I will simply show that lexical or syntactic analyses of any kind are unnecessary. In section 2, I give a brief presentation of some influential accounts of MDAs, in terms of the hierarchical lexicon and multiple inheritance. In section 3, I show how pragmatic principles can exclude literal interpretations of MDAs, in a context-dependent manner. In section 4, I

[1] Note that I do not consider cases of truly conventionalised meaning, e.g. *fruchtbar* 'fruitful', *laughable*, and *sensible*, where the contribution of the suffix is unclear.

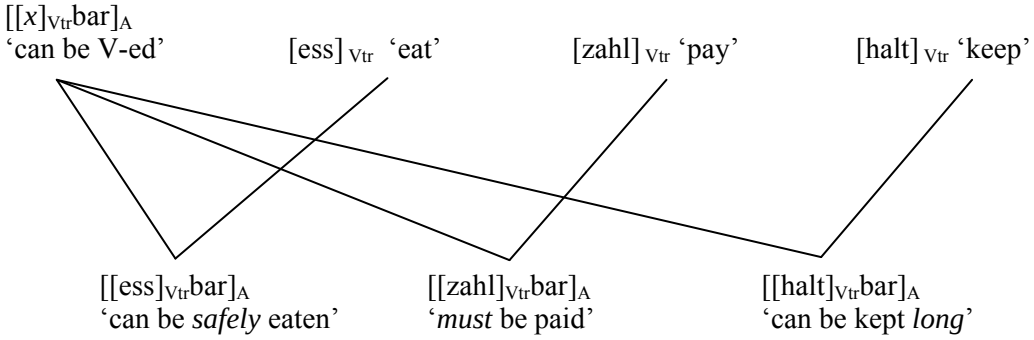
show that MDAs meet Gricean diagnostics for CIs and, crucially, that the examples under consideration are calculable as such. Finally, in section 5, I propose that this informal analysis should be formalised and integrated into the general theory of modality of Kratzer (1977 and 1981).

2. MDAs and the hierarchical lexicon

Riehemann (1994 and 1998) develops an account of MDAs in terms of a hierarchical lexicon, in which the phenomena are captured by complex recursive schemata structured in a multiple inheritance hierarchy. MDAs are represented as a word class under which the exceptional instances are non-monotonically grouped. This underspecification means that irregular forms can have properties that override the more general regular information given in the class definition. Riehemann argues that this approach is attractive because it permits the formalisation of lexical rules while also allowing for exceptions and sub-regularities to those rules. Furthermore, it greatly minimises redundancy in the lexicon.

Similarly, Booij (2007 and 2010a) proposes a constructionist account involving morphological sche-mata and multiple inheritance but, in contrast with Riehemann's system, no underspecification. That is, each adjective is fully specified for all its properties, both inherited and exceptional. A simplified fragment of the lexical item for *essbar* might look like this:

Figure 1. Inheritance tree for *–bar* adjectives (from Booij 2007: 62)



In Figure 1, each node inherits all the properties of the nodes that dominate it, and idiosyncratic properties (in italics) are stipulated as necessary. (Booij 2010b: 2-3) argues that the inherent redundancy of his approach (especially in contrast to the parsimony of Riehemann's) avoids the so-called "rule versus list fallacy" (Langacker 1987), which is the assumption that linguistic constructs are either generated by rule or listed and that being listed excludes a linguistic construct from being linked to a rule at the same time. Secondly, from the point of view of acquisition, avoiding redundancy would mean discarding memorised lexical information once a morphological schema is acquired. Finally, he argues that, since human memory is so vast, there is no good reason to expect that the lexicon will be parsimonious.

It should be noted that neither of these proposals (and, indeed, no other proposal that I know of) explains *why* a particular meaning arises in a particular context, while others are excluded. In contrast, the present approach will show that the meanings of MDAs are calculable as CIs, and offers a systematic way of predicting productivity and gaps in MDA formation.

3. Grice to the rescue

In this section, I argue that the semantics of productive MDA derivation is wholly regular and compositional. The *prima facie* "idiosyncratic" meanings are predictable from standard pragmatic principles, on the simple assumption that MDA derivation introduces a possibility operator (◇). Paraphrasing, MDAs have the meaning 'can be V-ed'[2]. This means that complex formal mechanisms such as those of Riehemann (1998) and Booij (2007 and 2010a) are unnecessary in order to account for these data (though they may be otherwise motivated).

Finally, given the pragmatic exclusion of the possibility meaning in any given context, I will show that the calculability of CIs yields the correct interpretation of the MDAs under consideration, in that context.

3.1 Excluding the possibility reading

3.1.1 *essbar* 'can be *safely* eaten'

For *essbar*, it is sufficient to point out that, in principle, everything is literally edible. Therefore, if *–bar* simply created an expression with the meaning 'can be eaten', it would violate Grice's (1975) second maxim of Quantity, as well as more recent formulations derived from it, e.g. Horn's (1984) R-principle ("make your contribution necessary; say no more than you must") or, more specifically, Ackerman and Goldberg's (1996) **Non-Redundancy Constraint** that forbids morphological operations from expressing redundant information. Thus, the eubouliatic meaning 'safely' is conversationally implicated, if it is appropriate in a given context. As we will see, the can vary with the context.

3.1.2 *zahlbar* '*must* be paid'

Intuitively, it is difficult to see what 'can be paid' means, without the deontic modality[3]. It might be possible to construct a scenario in which one can only pay for a product once one has taken delivery, in which case *zahlbar bei Erhalt* means 'can be paid upon receipt' rather than 'must be paid upon receipt'. This shows that the interpretation of *zahlba*r is context-dependent.

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[2] Another possible, and more general, meaning could be '[+modal] be V-ed'. However, this would miss the fact that the possibility reading of MDAs is the most common and productive one. Furthermore, it is questionable whether Gricean inferences from an abstract modal feature would yield the correct readings (if they are even possible).

[3] The relevant interpretation is that of *payable by the 15th*, which carries an implicature of obligation, rather than *payable in cash*, which can mean 'can be paid for in cash'.

Nevertheless, I will show in 4.5 that the deontic reading is calculable, as a scalar implicature.

3.1.3 *haltbar* 'non-perishable'

This is probably the trickiest case to cover in the general account, as it has the most conventionalised meaning. However, it typically occurs in the "best before" context, e.g. *haltbar bis 1. April*. Furthermore, the base of the derivation is most likely not *halten* 'hold' but rather *sich halten* 'last/keep'. We can see this if we compare an example containing *haltbar* with possible non-adjectival paraphrases using *sich halten* and *halt*:

(6) a. Das ist haltbar bis 1. April.
that is keep.able until 1 April
'That will keep until 1 April'
b. Das hält sich bis 1. April.
That keeps itself to 1 April
'That will keep until 1 April'
c. Das hält bis 1. April.
that lasts/keeps to 1 April
'That will last/hold until 1 April'

In (6b), the use of *hält sich* results in a straightforward paraphrase of the MDA construction in (6a). In contrast, the use of *halten* in (6c) yields an ambiguous sentence: it can be either a paraphrase of (6b), or a non-paraphrase with the meaning 'There is enough of that to last until 1 April'.

Given these facts, a plausible explanation is that the possibility reading of *haltbar* (i.e. 'can be held/kept') is typically excluded by the fact that anything can be literally kept in one's possession indefinitely (including rotting food), so some other reading must be pragmatically induced, on pain of redundancy.

4. Tests for conversational implicatures

Although possible exceptions to Grice's (1975) diagnostics have been noted since at least Sadock (1978), taken together, they remain powerful tools for identifying CIs, via their context-dependence. While it is sometimes difficult to demonstrate calculability (which involves general, sometimes fuzzy, reasoning), I show that it is possible in the case of MDAs. Furthermore, the hallmark of CIs, cancellability, clearly holds of their idiosyncratic meanings, as do non-conventionality, non-detachability, and reinforceability.

4.1 Cancellability

CIs can be distinguished from both conventional implicatures and entailments in that only they are cancellable. It is possible to cancel CIs explicitly but, since they depend crucially on context, they are also "contextually cancellable" if one can find situations in

which the utterance of the form of words would simply not carry the implicature (Grice 1975: 44). In other words, if an utterance of a sentence *S* conversationally implicates a proposition *p* in a context *C*, then there is a context *C′*, distinct from *C*, in which utterances of *S* do not commit the speaker to *p*.

If it is possible to find a context *C′* in which a typically "non-compositional" MDA receives a possibility interpretation, this shows that the idiosyncratic meaning is cancellable and, therefore, a CI. As the examples in (7-9) show, this is precisely the case.

(7) *lesbar*/*readable*:
   a. Imagine explaining what a book is to someone who has never come across one, but who knows how to read (e.g. from learning on the internet).
   b. One thing you could say about books is that they are *readable* things, that they can be read.[4]

(8) *essbar*/*edible*:
   a. Compare A: *Is this edible?* B: *Yes. It'll put you in hospital, but you can eat it* with A: *Is this safe to eat?* B: Yes. *#It'll put you in hospital, but it's safe to eat*.
   b. This shows that the eubouliatic readings of both *edible* and *can be eaten* are cancellable, whereas it is not if it is made explicit, and thus part of what is said.

(9) *chewable*:
   a. *They say Flintstones Vitamins are chewable. All vitamins are chewable, it's just that they taste shitty*.[5]
   b. At the risk of ruining the joke, this is funny precisely because Hedberg is opting out of the Cooperative Principle, thus pre-emptively invalidating any Gricean calculation of the implicature 'tastes good when chewed'.

These examples all clearly show that the idiosyncratic meanings of MDAs are cancellable in ways that conventional meanings are not.

4.2 Non-detachability

Implicata are linked to the *meanings* of utterances, rather than to the signs themselves. In other words, another sentence *S′* which expresses the same proposition *p* that *S* expresses, should produce the same CI that *S* produces.

For example, *edible* and *can be eaten* both implicate the eubouliatic meaning *safely*.

(10) A: Are these mushrooms poisonous?
   a. B: They're *edible* (→ They are *safe to eat*).
   b. B: You *can eat* them (→ They are *safe to eat*).

[4] Note, also, that one would expect blocking effects to prevent *readable* from meaning simply 'can be read' in most contexts, because that is what *legible* means.
[5] From Hedberg (2008), track 10 "Canal Smarts".

The fact that the implicatum survives in paraphrase shows that it is linked to the *meaning* of *edible* rather than to its form.

4.3 Non-conventionality

CIs are non-conventional in the sense that, although they depend on what is said, they are non-coded, and rely only on the *saying* of what is said. As Grice (1975: 58) puts it, "the truth of a conversational implicatum is not required by the truth of what is said". Returning to MDAs, nothing about the conventional/lexical meaning of idiosyncratic MDAs entails the semantic idiosyncrasies[6]:

(11) *zahlbar*/*payable* does not entail 'must pay': *payable in cash, by cheque or credit card*
(12) *lesbar*/*readable* does not entail ease/pleasure: *This book is readable, but it was hard work.*

In (11), the construction *payable in X* presents options, effectively enumerating possibilities for payment (each with the meaning 'can be paid'). Example (11) shows that *readable* does not have to mean 'easy to read' but, depending on context, can mean 'can be read with effort'. Both examples clearly show that the interpretation of MDAs is non-conventional, context-dependent and, thus, pragmatic rather than lexical.

4.4 Reinforceability

The reinforceability of CIs is the fact that they can be made explicit – that is, they can be made part of what is said – without resulting in redundancy, or at least not enough redundancy to cause infelicity. The CIs arising from MDAs are reinforceable, as the following examples show.

(13) essbar/edible
Es ist sicher essbar.
it is safely edible
'It is safely edible.'
(14) zahlbar
Rechnungsstellung zahlbar spätestens jedoch 30 Tage nach Empfang
invoice payable no later than 30 days after receipt
'Invoice payable no later than 30 days after receipt'

This is further clear evidence that the non-circumstantial modal meanings of MDAs are not part of their conventional import. The locutions *sicher essbar* 'safely edible' and *zahlbar spätestens* 'payable no later than' are not redundant but, rather, simply reinforce the CIs, by making them explicit.

[6] *Haltbar* might be an exception to this, precisely because of its more conventionalised meaning. However, a different possible account is given below, in keeping with the general approach adopted.

4.5 Calculability: Predicting idiosyncratic meanings

It is important to note that no existing theory has an explanation for why a particular meaning will occur in a particular context, and not others. If, however, the idiosyncratic meanings under consideration can be calculated as implicata, it will strongly suggest that MDAs are semantically regular and compositional, and that the complex mechanisms outlined above are unnecessary.

I propose that the conversationally-implicated meanings of (many) MDAs are calculated by applying the literal meaning to the verb in the most general context, and then extracting the most salient outcome(s)[7]. This salient information, then, becomes part of the context of evaluation.

(15) *edible*/*essbar*:
- a. The most salient fact about eating random objects and substances is that it is risky to do so, and the most likely outcome is injury or death.
- b. Given the salience of the risk, the conversationally implicated meaning is 'can be safely eaten' or 'can be eaten without risk'.
- c. This could be formalised in terms of Kratzer's (1977) account of sentential modality: since assuming the most general modal base would result in injury or death, it is excluded and the modal base is restricted to only those worlds in which everything that is done, is done safely. This thus induces a eubouliatic modal base.

(16) *chewable*:
- a. Vitamins that are *chewable* are vitamins that taste good when chewed.
- b. Since all vitamins can literally be chewed, the most salient fact about chewing "non-chewable" vitamins is not that they are bad for you or that they do not work (as vitamins) but, rather, that they taste bad and have a nasty texture.
- c. Therefore, the meaning of *chewable* (when one is talking about vitamins) is 'will taste good when chewed'.

(17) *zahlbar* '*must* be paid':
- a. A *must*-reading can be derived pragmatically, in the following way: *zahlbar bis zum 1. April* 'payable by the 1 April' means that one can wait until 1 April to pay.
- b. Then, by scalar implicature, one infers that one is not allowed to wait until 2 April, 3 April, and so on, because if one were allowed to pay even later, the speaker would have said so (by the first maxim of Quantity).
- c. Therefore, one must pay no later than 1 April.

(18) *haltbar* 'non-perishable':
- a. Food that is *haltbar* is food that will maintain its edibility and physical integrity longer than a typical food item, perhaps even indefinitely.
- b. The most salient outcome of keeping most food indefinitely is that it will rot and become inedible.

[7] For some examples, like *zahlbar* 'payable', this is not enough, so other kinds of pragmatic inference (e.g. scalar implicatures) are necessary, as we will see below.

c. Therefore, *haltbar* conversationally implicates that a food item will maintain its edibility and physical integrity longer than a typical food item.

Crucially, this approach predicts that in different contexts, the same MDA can have different interpretations. This is, of course, the case.

(19) a. *chewable* 'tastes good when chewed', e.g. *Flintstones Vitamins are chewable*.
b. *chewable* 'can be chewed', e.g. *water isn't chewable, bubble gum is*.
(20) a. *changeable* 'can be changed', e.g. *our plans are changeable*.
b. *changeable* 'can change', e.g. *the weather in England is very changeable*.

As (19b) and (20b) show, it is possible to induce possibility readings of MDAs, which would otherwise be ruled out by Quantity 2, if the context is such that that meaning is informative. In (19b), something that is chewable is contrasted with something that is not, and this would be non-redundant information in a context where that contrast is relevant. In (20b), since it is implausible that weather can be changed, the possibility reading is preferred (though, of course, it can mean 'can be changed' in the right context, e.g. *The weather is changeable by God*). Given that Grice's diagnostics largely reduce to the context-dependence of CIs (cf. e.g. Kadmon 2001), these data are further strong evidence in favour of the present account.

5. Conclusions

We have seen that neither lexical nor syntactic mechanisms are required in order to account for the "idiosyncratic" meanings of many MDAs. Assuming that they uniformly have the semantic meaning 'can be V-ed', pragmatic principles suffice, not only in order to exclude that meaning in the appropriate contexts, but also to predict the correct interpretation in any given context.

Kratzer (1981) develops a semantic approach that is designed to account for precisely these kinds of data. Interestingly, though she does cite MDAs as problematic, her account is not extended to cover them. The basic idea is that modals are not lexically ambiguous but, rather, that they are semantically skeletal and combine with a contextually-given modal base and ordering source to yield various readings. If we assume that MDAs simply introduce a weak modal operator, we would expect exactly the kinds of idiosyncrasy exhibited above, which reflect the general context-dependence of possibility modals. Despite the fact that formal semantic approaches to sentential modality, like Kratzer's, are designed to deal with these kinds of phenomena, prior accounts of MDAs have neglected these techniques, in favour of complex lexical mechanisms. Although the formalisation of the present account in these terms is a matter for future work, I hope to have shown that lexical approaches to MDA formation are based on superficial understandings of the meanings of MDAs. By assuming that the modal element of an MDA works more or less like a standard possibility modal, the supposedly idiosyncratic meanings of MDAs can be calculated via the standard semantic/pragmatic machinery. This entails that, in contrast to common assumptions in the literature, MDAs are semantically regular and compositional.

Finally, it is important to note that this is not an argument against constructional approaches or, of course, against lexicalisation in general. Furthermore, I have focused only on cases of semantic idiosyncrasy. Riehemann's (1998) and Booij's (2010a) analysis is intended to account for all kinds of regularities and irregularities, whether semantic, syntactic, lexical, or phonological. Since inheritance hierarchies have been motivated in many different theoretical frameworks, including HPSG (Riehemann 1998; Sag et al. 2003), Network Morphology (Brown and Hippisley 2012), Cognitive Grammar (Lakoff 1987), Word Grammar, (Fraser and Hudson 1992) and Construction Grammar (Goldberg 1995; Booij 2010a), this should not be taken as a general argument against them, just against one particular application.

Nevertheless, given that the putative non-compositionality of MDAs has been adduced as powerful motivation for the hierarchical lexicon, at least some of those arguments ought to be reconsidered.

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