Review

Definitions: Implications for Syntax, Semantics, and the Language of Thought

By ANNABEL CORMACK.
New York: Garland, 1998. Pp. xi + 362.

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Definitions have come in for some pretty bad press in recent years. In fact, there is fairly general agreement in linguistics and cognitive science that very few words have definitions (and general agreement is something which is pretty rare in both of these fields). So it might come as something of a surprise to find a book which takes as its area of investigation the syntax and semantics of definitions.

At the same time, however, it is true that there are countless dictionaries and text books full of definitions, and that most of us find such definitions invaluable. We even argue over which of several definitions is the most accurate, and this would seem to suggest that there are such things as definitions after all. Cormack sets out to investigate this apparent dilemma.

The book appears in Garland's Outstanding Dissertations in Linguistics series, and the text is basically that of Cormack's 1989 Ph.D. thesis, with only minor revisions and the addition of a new preface and an index. The book is divided into five chapters. Chapter one introduces the various theoretical tools which Cormack will use for her analysis: principles-and-parameters syntax, model-theoretic semantics, relevance-theoretic pragmatics, and Fodor's 'language of thought' hypothesis. Chapters two and three contain the main analysis of dictionary definitions and text definitions, respectively. Chapters four and five present the conclusions for syntax and the language of thought.

The book is impressive, not least because it demonstrates a remarkable command of diverse theoretical frameworks. The analysis is extremely detailed, and the conclusions far-reaching. Since the text is now well over ten years old, however, much of it is out of date. This is especially true of the syntax, and many of Cormack's analyses would have to be reworked, particularly in light of developments within the Minimalist framework. This leaves the status of many of her syntactic proposals uncertain. In this review, I will concentrate on the implications of Cormack's analysis for the language of thought (henceforth LOT).

There is a sense in which the dilemma which Cormack sets out to resolve is based on an equivocation. On the one hand, the consensus is that there are few definitions *in the sense of singly necessary and jointly sufficient conditions*. On the other hand, dictionaries and text books are full of seemingly useful definitions *which do not in general provide necessary and sufficient conditions for the application of a term*. It is important to keep this distinction in mind.

Cormack sees the analysis of definitions as being important for two reasons. First, they are syntactically unusual in several ways, so their analysis can shed light on

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various syntactic issues. For example, in dictionary definitions the definiens is usually an isolated phrase rather than a clause. Because these phrases must be understood in isolation, they provide some interesting challenges for principles-and-parameters syntax, an approach which generally has interpretation taking place at the clausal level. Cormack uses some novel syntactic devices (such as a reanalysis of DP-movement), together with model-theoretic semantics, to overcome these challenges. Model theory is particularly suited to an analysis of this sort, since it is based on the assumption that interpretation takes place in tandem with syntax, providing a principled method for interpreting phrases in isolation.

More radically, Cormack sees the analysis of definitions as providing insights into the nature of the language of thought. For Cormack, the reason we find definitions useful is that they allow the elimination of the defined term at some level of representation (probably at the level of LOT itself). This requires, in the case of dictionary definitions, that the definiens is translated into LOT, so that the definiendum can then be eliminated by being replaced with this translation. Given Cormack's framework, it is therefore necessary for LOT to have the same semantic type system as natural language, so that such a translation can take place. If elimination occurs at the level of LOT, this also implies that items of LOT must correspond approximately one-to-one to items of natural language. In the case of text definitions such as (1) things are a little more complex, since there is nothing which corresponds directly to the definiens.

(1) Two sets that have some members in common are said to *intersect*

One of the implications which Cormack draws from her analysis of these definitions is that LOT, like natural language, must have variables.

Cormack notes that there are two distinct ways in which definitions might be useful to us. A definition might be useful solely in enabling a new natural language word to be learned. This would be the case if we already had an atomic concept corresponding to the definiendum, but no natural language word expressing it. Then the purpose of the definiens would be merely to identify the correct concept in order that the natural language word (the definiendum) could be associated with it. Cormack also considers another possibility. Where there is no atomic concept corresponding to the definiendum, the definiens might enable a new concept to be constructed. Both of these ideas would seem to face certain difficulties, however.

Cormack's proposals about concept learning could be summarised as follows. On encountering a (putative) definition for a novel natural language word, the definiens is translated into LOT. If this translation fails to identify an atomic concept corresponding to the definiendum, then a new 'blank' concept is constructed to act as the LOT translation of the definiendum. This new concept is linked with the translation of the definiens via biconditionals (and/or meaning postulates), allowing the definiendum to be eliminated. As we have seen, this approach means that strong constraints are placed on the properties of LOT.

There are several potential problems with this picture. First, there is a problem with the idea that the LOT translation of the definiens could be used to identify whether or not we have a concept corresponding to the definiendum. When we encounter a definition for a novel natural language word, how do we determine whether we should associate the definiendum with some existing concept, or create a new concept? In those (rare) cases where the definiens provides a precise definition for the definiendum (in the sense of encoding necessary and sufficient conditions for its application), we can take it that the LOT translation of the definiens will precisely identify the atomic concept

corresponding to the definiendum. If no atomic concept can be identified in this way, then a new concept is constructed. The problem with this is that most concepts *cannot* be defined precisely: KNOWLEDGE, PAINT$_{vt}$, CAT, CHAIR, GAME—none of these can be defined in terms of necessary and sufficient conditions. So in the vast majority of cases, the LOT translation of the definiens cannot be used to determine whether we have an atomic concept corresponding to the definiendum. For example, the definition for 'sport' may suggest the concept GAME. Is this the concept to be associated with the word? How do we know? This problem is made all the more serious by the fact that the user of a definition does not generally *know* whether the definition encodes a set of necessary and sufficient conditions or not.

In fact, of course, we create new 'blank' concepts all the time. Whenever we entertain a mental representation of a sentence which contains some unknown or poorly-understood word, we need to represent this word mentally. And we need to do this before we have even decided to reach for a dictionary. So it would seem that in many cases it is not the definition which facilitates the construction of a new concept. A putative definition may allow meaning postulates or encyclopaedic information to be attached to this new concept, but context can do the same thing. For example, I hear the sentence 'wugs make very good pets', and in the right context (one where I can rule out electronic Japanese 'pets' as the topic of conversation, for instance) I attach the meaning postulate 'x WUG $y \rightarrow x$ ANIMAL y' to the blank concept designated as the translation for 'wug'.

Even in those rare cases where we have what we know to be a strict definition of a new natural language term, providing necessary and sufficient conditions for its application, there is still a problem. What does the individual gain by constructing a new atomic concept to represent the complex LOT expression? Cormack suggests that information filed under an atomic concept can be retrieved more quickly. But this is not necessarily the case. For example, I have an important piece of information relating to black cats: viz., that they are unlucky and should be avoided, particularly near ladders. Where is this piece of information stored? One proposal would be that it is stored under the concept CAT (or possibly under the concept BLACK, or perhaps even under both). Then I will have access to this information whenever I mentally token the complex conceptual expression BLACK CAT.[1] The alternative is that I create a new (atomic) concept, BLACKCAT, under which this piece of information is stored. This might reduce effort, since the information stored under BLACKCAT will be much less than the total information stored under the concepts BLACK and CAT, so I will have to sift through a lot less information. But the problem is that by doing this I lose the (vital) information that a BLACKCAT is both black and a cat. If this information has to be explicitly represented (say, with meaning postulates), then we have not necessarily gained anything. I either still have to refer to the information stored under BLACK and CAT to run my inferences, or all this information has to be repeated under BLACKCAT. In certain cases, it may be cognitively economical to construct an atomic concept corresponding to a complex LOT expression (BACHELOR might be one example, and proverbs might be another); in other cases (BLACKCAT, for example) it may not be economical. The decision should be an empirical one, but for Cormack it is a theoretical one: if she wants to maintain that definitions are useful because they allow elimination of the definiendum, she has to say that there is an atomic concept corresponding to the definiendum.

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[1] I would also have potential access to this information whenever just CAT was tokened, or TIDDLES, or ANIMAL, or … . The point is that when I token CAT in the context BLACK _____, this particular piece of information is presumably more salient, hence more accessible.

So there seems to be a problem with the idea that definitions could facilitate the association of a word with a pre-existing atomic concept. Definitions may allow meaning postulates and encyclopaedic information to be attached to a 'blank' concept which has been set up as the LOT translation of a natural language word, although they are not unique in doing this. In the case of a definition which does encode necessary and sufficient conditions (say, a definition of a mathematical term), the 'blank' concept with biconditionals attached would have the appropriate content. It should be an empirical question, however, whether an atomic concept such as this is established, or whether a complex concept (corresponding to the LOT translation of the definiens) is associated with the natural language term.

In this review I have touched upon some problems I perceive with Cormack's conclusions regarding the language of thought. But this represents only a small part of her enterprise. Overall, I learned a great deal from this extremely thought-provoking book. It is full of insights into many aspects of syntax and semantics, and should be read by anyone with an interest in these fields.

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