



# An Overview of Lexical Semantics

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## Abstract

This article reviews some linguistic and philosophical work in lexical semantics. In Section 1, the general methods of lexical semantics are explored, with particular attention to how semantic features of verbs are associated with grammatical patterns. In Section 2, philosophical consequences and issues arising from this sort of research is reviewed.

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There is a longstanding philosophical tradition, going back at least to Parmenides and Socrates, of paying much attention to the meaning of words. In the twentieth century, Wittgenstein, Quine, and others centered a great deal of their philosophical research around a number of general questions regarding the nature of meanings, how words might come to have meanings, the relationship between words and their worldly denotations, etc. Although it is a subfield of linguistics, lexical semantics can be viewed as a refinement of this philosophical tradition. Moreover, just as the philosophical study of word-meaning has been realized in various different ways, so too there are many distinct linguistic projects that fall under the rubric of ‘lexical semantics’. The present article focuses on one central aspect of lexical semantics. In particular, I will consider those aspects of word-meaning that appear to be intimately connected to aspects of the ‘syntax’ or structural design of human languages. While this type of research is extremely common in linguistics, it often plays a less central role in philosophical discussions. There are exceptions to this, however; e.g., James Higginbotham has postulated that

What is crucial to the design of language is not some distinction, however drawn, between properly semantic information, on the one hand, and empirical or collateral information, on the other, but rather the distinction between information that has systematic grammatical effects and information that does not. (470)

At this point, the question immediately arises as to what it might be for semantic structure to have ‘systematic grammatical effects’. How could semantics affect syntax, and what kind of evidence for such a view could there plausibly be? I address these questions in Section 1 with a somewhat detailed example that illustrates the kinds of methods linguists use to

adduce evidence for syntactically relevant semantic structure in words. In Section 2, I explore two places where lexical semantics is philosophically relevant: in issues regarding analyticity and the identification/individuation of concepts. I conclude in Section 3.

### *1. Extracting Structure from Patterns: An Example of Lexical Semantics Research*

Let's begin by considering a miniature example of how linguists use grammatical distributions of words as evidence for the presence of complex semantic structure in the words. (Parts of the following example come from Levin, *English Verb Classes*.) I stress that this example is only meant to illustrate the types of methods and evidence linguists use. In actual research, considerably more evidence, often involving multiple languages, is typically used.

Consider the verbs *break*, *cut*, *hit*, and *touch*, which all appear as transitive verbs:

- (1) a. Margaret cut the bread;  
b. Janet broke the vase;  
c. Terry touched the cat;  
d. Carla hit the door.

However, these verbs are not equally acceptable in the so-called *conative construction*:

- (2) a. Margaret cut at the bread;  
b. \*Janet broke at the vase;  
c. \*Terry touched at the cat;  
d. Carla hit at the door.

Another difference in patterning appears when we examine the *part-whole alternation*:

- (3) a. (i) Margaret cut Bill's arm;  
(ii) Margaret cut Bill on the arm;  
b. (i) Janet broke Bill's finger;  
(ii) \*Janet broke Bill on the finger;  
c. (i) Terry touched Bill's shoulder;  
(ii) Terry touched Bill on the shoulder;  
d. (i) Carla hit Bill's back;  
(ii) Carla hit Bill on the back.

A third source of difference in acceptability comes from the *middle construction*:

- (4) a. The bread cuts easily;  
b. Crystal vases break easily;  
c. \*Cats touch easily;  
d. \*The door frame hits easily.

Finally, only *break* has an *inchoative* form (similar in meaning to the passive voice):

- (5) a. ??? The bread cut;  
 b. The vase broke;  
 c. \* The cat touched;  
 d. \* The door hit.

Thus, each verb is distinct from the others with respect to its behavior in these four constructions:

	<b>Conative</b>	<b>Part-Whole</b>	<b>Middle</b>	<b>Inchoative</b>
<i>cut</i>	Yes	Yes	Yes	No?
<i>break</i>	No	No	Yes	Yes
<i>touch</i>	No	Yes	No	No
<i>hit</i>	Yes	Yes	No	No

It is unlikely that this distribution is an accident, because many other verbs pattern in these ways. Verbs that pattern like *cut* in these constructions include: *hack*, *saw*, *scratch*, and *slash*. Patterning like *break* are *crack*, *rip*, *shatter*, and *snap*; like *touch* are: *pat*, *stroke*, and *tickle*; like *hit* are: *bash*, *kick*, *pound*, *tap*, and *whack*.

We have isolated these four classes of verbs by their syntactic behavior. In the rest of this Section, I present some of the semantic evidence linguists use to identify these same verb classes.

Verbs that appear in the conative alternation, like *cut* and *hit*, have as a part of their meaning that the action of the verb may not have been successful, but was only ‘attempted’ (Levin, *English Verb Classes* 42). But you can also attempt to touch or break something without successfully doing so. Why don’t we say that a person might \**touch at* or \**break at* something? A clue about this distribution comes when we notice that both *cut* and *hit* specify a certain kind of motion that leads to a successful act of cutting or hitting. To cut something is to make a kind of lengthwise movement on the surface of the object; to hit something is to move something (like one’s hand) at it. On the other hand, neither *touch* nor *break* specify anything about the motion that leads to a touching or a breaking. These two verbs only specify the end result of the action of the verb. Thus, it appears plausible that a necessary condition on a verb’s appearing in the conative construction is that it specifies some sort of manner of motion. We can adduce some further evidence for this claim when we notice that a verb like *hit* can either express a manner or only an end result: *John hit Mary* can mean either that John swatted Mary, or that he collided into her, perhaps with his car. When *hit* only expresses an end result, it does not appear in the conative. If John is an assassin and unsuccessfully tries to smash into Mary’s car with his own, we do not say \**John hit at Mary*; compare also *John swatted at Mary* vs. \**John collided at Mary*.<sup>1</sup>

What about the part-whole construction? This construction has the form *Subject Verb Whole on Part* (sometimes replacing *on* with another preposition specifying the location on the whole of the action performed on the part). We get an initial glimpse of the semantic properties of verbs that enter into this construction when we notice that they express some way of affecting the direct object, but not a total transforming affect, as in (6):<sup>2</sup>

- (6) a. destroy, create, break, build, kill
- b. hit, kiss, touch, cut, wound, pierce
- c. watch, see, hear, like

The verbs in (6a) are verbs of creation and destruction, and so their effect on their object cannot be localized to a part of the object only. Thus, while you can *destroy Ted's elbow*, you cannot *\*destroy Ted on the elbow*. The reason for this is that in the part-whole construction, the part is the complement of a preposition that specifies the location of the action of the verb. Since the verbs in (6a) specify an event that completely changes the direct object, to specify where on the direct object the event occurs is incoherent (from the perspective of our language). The creation of a child does not occur on a part of the child, for instance. Similarly, if you break something, the language views this event as an alteration of the whole thing. So even if the break occurred on a specific part, the status of the thing as broken is not limited to only that part. A natural reaction to the sentence *\*Janet broke the car on the engine* is that Janet didn't break the whole car, but only its engine. This is precisely the intuition we would expect speakers to have: the transformation indicated by *break* extends to only the car's engine; the stereo system may still work.<sup>3</sup> In contrast to the verbs in (6a), being cut (or touched or hit, etc.), does not imply that the whole object is globally altered, but only that a part of it is. If something is cut, our language appears to represent the situation as one where the alteration is localized to a specific part of the thing, without necessarily changing the overall state of the whole. The verbs in (6c) show that in order to appear in the part-whole construction, some sort of action, perhaps one requiring contact, must be performed on the object.

Interestingly, a look at the distribution of words appearing in the part-whole construction suggests that it may be associated with a more general type of action. When we examine verbs that involve the subject's acting on an object, we find that some of them have intransitive 'inchoative' counterparts:

- (7) a. I broke/shattered/snapped the cup;
- b. The cup broke/shattered/snapped;
- c. I touched/hit/kissed/cut/bruised the jellyfish;
- d. *\** the jellyfish touched/hit/kissed/cut/bruised.

As we will see later, there are good reasons for supposing that the meaning of the 'causative' verbs (i.e., transitive verbs that have inchoative counterparts)

is something like *the subject causes the object to enter into a state of type X*, where X is given by the meaning of the inchoative verb. Many causative verbs do not appear in the part-whole construction.

- (8) a. \* I broke/shattered/snapped the cup on the handle;  
     b. I touched/hit/kissed/cut/bruised the jellyfish on the top of its head.

Although causative verb's resistance to the part-whole construction is not total,<sup>4</sup> it does not appear to accidental, either. As (9) shows, certain verbs like *smack* can appear both as causative verbs and in the part-whole construction. However, when the context makes *smack* an unambiguously causative verb, it cannot appear in the part-whole construction.

- (9) a. Mary smacked John against the house.  
     b. John smacked against the house.  
     c. Mary smacked John on the back (with a club).  
     d. \* I smacked John on the back against the house.

In addition to a requirement on the kind of action performed on the object, the part-whole construction also requires that the part be very closely allied with the whole. In other words, the part must in some sense really be a *part* of the whole.

- (10) a. I hit John's arm;  
     b. I hit John on the arm;  
         a. I hit John's book;  
         b. \* I hit John on the book.

However, what counts as a part of something does not always precisely track the intuitions of our higher cognition:

- (11) a. The bombs hit us on the roof.  
     b. Mary touched John on the sleeve.

(The 'metaphorical' extensions our language allows are limited; (11b) would be hard to use if John is not wearing the sleeve [e.g., if it is at the dry cleaners].)

As these examples illustrate, linguists' terms like *part* and *cause* are theoretical, and may not jibe with ordinary intuitions about the meanings of the English words *part* and *cause*. In the present context, what matters is that the grammatical distributions in question do appear to track a kind of semantic distinction. The exact nature of the semantic properties in question and their metaphysical status does not concern us at present. There is quite a bit more data that can be adduced about the semantic properties of the part-whole construction. However, since my intention here is only to give an example of how the grammatical distributions of words can support hypotheses about the semantic structure of words, I will leave the matter here.

Our third example is the middle construction. Middles have received a great deal of attention in the literature (discussions of middles can be found in e.g., Ackema and Schoorlemmer; Grimshaw, *Argument Structure*; Carrier and Randall; Hale and Keyser, ‘Some Transitivity Alternations’; ‘View from the Middle’; ‘Syntactic Character’; ‘On Argument Structure’; Hoekstra and Roberts; Jackendoff, *Semantic Structures* 235–6; Levin and Rappaport Hovav, *Unaccusativity*; Rapoport; Stroik; Tenny; Zubizarreta). A major difficulty for theories of middle formation is that speakers’ judgments of grammaticality are notoriously unclear. Judgments are inconsistent across speakers, and individual speakers often have no clear judgment about the grammaticality of a middle sentence. Nonetheless, certain fairly stable judgmental patterns can be discerned. For instance, there is good evidence that middle formation is closely connected to whether or not the direct object is ‘affected’ by the action of the verb. The middles in (12), for instance, all involve some sort of change of state of the object:

- (12) a. The door opens/closes easily;
- b. The roulette wheel spins with just a slight push;
- c. This meat won’t blacken if you cook it in the microwave;
- d. John awakens whenever a dog barks.

In contrast, seeing or resembling or appreciating something does not affect the object, and such verbs do not appear as middles:

- (13) a. ★ The skyline doesn’t see well during a heavy rain;
- b. ★ Susan resembles with a bit of makeup;
- c. ★ Movie stars remember/notice easily in Hollywood;
- d. ★ Shakespeare appreciates easily.

The hypothesis that the middle construction requires that the verb ‘affect’ its direct object correctly predicts the distribution in our target example.<sup>5</sup> Touching or hitting something does not necessarily affect the state of the thing, but cutting or breaking it does. (Of course if I hit the vase, then the vase now is in the state of having been hit by me. As we will see repeatedly, there is a sense in which our language does not treat such ‘Cambridge changes’ as changes of state at all, and this fact is manifested in the very grammar of our language.) More detailed theorizing along these lines can be found in the citations mentioned above. Additional support for the ‘Affectedness Constraint’ (AC) on middle formation comes from the fact that we can make some rather fine-grained predictions with it. For instance, to pound metal does not necessarily change the state of the metal. So we can correctly predict that *pound* does not appear in the middle:

- (14) ★ The metal pounds easily.

However, the resultative verb phrase *pound flat*, meaning to pound something with the result that it becomes flat, obviously does involve some

change of state. So, we can correctly predict that this slight change in the clause will alter its ability to appear as a middle:

- (15) The metal pounds flat easily.

Principles such as the AC link lexical semantics to grammar. (Such principles are sometimes called *linking rules* or *linking regularities*.) If it turned out that AC or something like it could divide the verbs into those that appeared as middles and those that did not, then it would seem that AC (or whatever principle is used in its place) would be an important part of an *explanation* of why some verbs appear as middles and others do not. In such a case, it would seem plausible to suppose that AC is true, and that some verbs specify in their semantic structure that they affect their direct object (in the right way). To be sure, AC is not the end of the story about the distribution of middles, on most current accounts.<sup>6</sup> It does, however, represent the general *sort* of principle that lexical semanticists formulate and study.

Our final example is the causative/inchoative alternation (as in *John broke the vase/the vase broke*), which has been the subject of much philosophical and linguistic discussion (e.g., Comrie; Fodor, ‘Three Reasons for Not Deriving’; Dowty, *Word Meaning*; Parsons; Levin and Rappaport Hovav, *Unaccusativity*; Pietroski, ‘Small Verbs, Complex Events’). Roughly speaking, the transitive ‘causative’ form of the verb expresses that the subject causes some sort of change of state in the object, and the intransitive inchoative form expresses that the object of the causative (which is the subject of the inchoative) changed into the state in question. Only *break* specifies an end state that is the result of the action of the transitive verb. In contrast, verbs like *touch* and *hit* describe the manner of motion of the action of the verb.<sup>7</sup>

The kinds of additional structure produced as a result of using the concept CAUSE (or something like it; see below) may also be used to suggest that the concept (or something that induces a similar structure) is part of the meaning of the various words and expressions. For instance, we might give the meaning of *break* in terms of the concept BROKEN: *X breaks Y iff X causes\** *Y to become broken*. Decomposing the meaning of inchoatives into constructions containing the past participle adjective is convenient, since inchoatives are exemplary members of a larger class of verbs (unaccusatives), a common diagnostic for which is the ability to form past participles. Thus, we have: *broken bottle*, *cut leg*, and *boiled fish*. However, intransitive verbs that are not unaccusative (and so not inchoative) do not have adjectival counterparts: *\*run jogger*, *\*whistled teapot*, etc. (Cf. e.g., Grimshaw, ‘Unaccusatives’; *Argument Structure*; Levin and Rappaport Hovav, *Unaccusativity*; ‘Lexical Semantics’). Thus, it may be that inchoative verbs (and unaccusatives more generally) are formed from the meanings of past participle adjectives, and where there are no such adjectives, no corresponding verb can be formed.

We saw earlier that the linguist's notion of *part*, as in the analysis of the part-whole alternation is theoretical, and not bound to jibe with the meaning of the English word *part*. In the present case, the linguist's theoretical term *cause* is also theoretical, and it is well-known to be distinct from the English word *cause* (Wolff; Johnson, 'Tacit and Accessible Understanding'). For example, if a chef ordered an assistant to break an egg, the chef may have caused the egg to become broken, but the chef didn't break the egg; the assistant did. Some philosophers, most notably Jerry Fodor, have questioned the linguist's use of theoretical notions like *cause* (Fodor, 'Three Reasons for Not Deriving'; 'Review'). One of Fodor's repeated worries is that linguists have not precisely defined this technical term. Without such a definition, he argues, the linguist's hypothesis that this bit of semantic structure exists in words becomes nearly irrefutable. After all, consider what can happen when a potential counterexample turns up, appearing to refute a prediction of the form 'Verbs containing the causal morpheme do/do not participate in syntactic distribution D'. Since there is no precise statement of the meaning of the causal morpheme, the linguist is free to deny that the alleged counterexample really is one, arguing instead that the alleged counterexample just shows that the causal morpheme must not be present in the verb's structure after all. In short, without a firm grasp of the meaning of the purported causal semantic element of some verbs, it is unclear how the theory could ever be disconfirmed.

The proper response to this objection involves several details concerning both linguistic and scientific methodology (Johnson, 'Impossible Words'; 'Legacy of Methodological Dualism'). However, at present, it is enough to say that there is overwhelming empirical evidence for the presence of a causal morpheme in many verbs in the worlds' spoken languages. In fact, in a great many languages (e.g., Tagalog, Malagasy, Turkish, etc.) causal morphemes are explicitly realized as pronounced affixes to root verbs (Baker; Bittner; Hale and Keyser, 'On Argument Structure' 102; cf. e.g., Comrie; Tenny 237). To take just one example, in Tagalog, *The child fell* is given as *Tumumba ang bata*, whereas *Rosa knocked the child down* is *Nagtumba ng bata si Rosa*; the same morpheme *pag* (phonologically realized here as *nag*). This same morpheme attaches to a great many verbs, with a subsequent change in the verb's meaning from  $\phi$  to  $x$  made/caused  $\phi$  to happen (Travis 155).

As the examples of this section illustrate, a key strategy in linguistics for adducing evidence for the presence of underlying semantic structure in verbs lies not in examining individual sentences (or other expressions), but the inspection of broader *patterns* of data. It would be simply stipulative to reflect on the meaning of the verb *break*, and declare on that basis alone that its linguistic structure contains a component expressing something like causation. However, when we expand our purview to include larger terrains of grammatical and ungrammatical sentences, the resulting congeries produces explananda which themselves can provide evidence for

the presence of unobserved semantic structure (Johnson, ‘Impossible Words’; ‘Legacy of Methodological Dualism’).

## 2. Foundational Issues Concerning Lexical Semantics Research

There are several consequences for philosophy in the lexical semanticist’s thesis that many of our words are semantically structured in the ways described above. In this section, I briefly characterize a few of them.

Perhaps the most immediate point of contact between lexical semantics and philosophy concerns the analytic/synthetic distinction. Since Quine, there has been much discussion about whether there can be sentences that are true solely in virtue of the meaning of their words. Much of this philosophical debate has concentrated on such issues as whether sentences like *If a person is a bachelor, then he is unmarried* is analytically true. In these discussions, the central issue was whether the meaning of the noun *bachelor* ‘contains’, in some sense, the meaning of the adjective *unmarried*. There was, and continues to be, much discussion about what it is to understand the meaning of *bachelor*, and what it is to possess the concept of a bachelor. (Can you really understand the meaning of *bachelor* without knowing that bachelors are unmarried?)

As our example in Section 1 shows, research into lexical semantics bears on issues of analyticity in strikingly different ways. Rather than approach analyticity with questions about concept possession and understanding, lexical semantics points to what our best linguistic theories tell us about the internal structure of words. This methodological difference leads to a number of further refinements regarding analyticity and our research into it.

The first such difference is that the study of analyticity, is a straightforwardly *empirical* matter. For example, a lexical semanticist might contend that (16) is analytic:

- (16) If someone broke the vase, then the vase broke.

From the perspective of lexical semantics, (18) is a reasonable candidate for analyticity. Using a wealth of evidence like that presented in Section 1, many lexical semanticists have inferred that transitive verbs like *break* contain an unpronounced ‘causative’ morpheme. Moreover, their evidence supports the view that a sentence of the form *X break Y* has a *syntactic* structure that is roughly similar to *X cause\** [*Y break*], where the semantic interpretation of the latter is roughly ‘X causes the event of Y breaking’. On this analysis, then, the appropriate semantic interpretation of (16) might be something along the lines of:

- (17) If, in the past, there were events  $e_1$  and  $e_2$  such that  $e_1$  is an event of someone’s causing  $e_2$ , and  $e_2$  is an event of the vase’s breaking, then there was an event  $e_2$  of the vase’s breaking.

If the interpretation in (17) is correct, then (16) may indeed be analytically true (cf. Pietroski, ‘Small Verbs, Complex Events’ for detailed discussion of this issue). But the correctness of (17) is a largely empirical matter, because it’s an empirical question whether human languages contain the morpheme *cause*. If there is such a morpheme, as the evidence suggests, then (17) may be the correct interpretation of (16). But if new evidence appears, and better empirical theories of language are adopted that do not employ the morpheme, then it could easily turn out that (17) is not a candidate analytic statement. In contrast to many philosophical debates, from the perspective of lexical semantics, the analyticity of sentence is not primarily an issue to be resolved by philosophical clarification of such notions as ‘analytic’, ‘understanding’, and the like.

Importantly, the empirical nature of the lexical semanticist’s treatment of analyticity does not suggest that there is no need for such philosophical clarification. For instance, even if one grants that considerations from lexical semantics provide a sufficient condition for a sentence to be analytic, this condition may not be necessary. Philosophical research may be able to show that there are other sentences which are also analytic, but in virtue of some other reasons. Even more likely, perhaps, is the possibility that by examining the way that lexical semantics justifies a claim about the analyticity of some sentence, philosophers may be able to identify multiple different *kinds* of analyticity, suitable for different purposes. For instance, it may be useful to distinguish a notion of analyticity relevant to lexical semantics from another notion of analyticity relevant to philosophical discussions of language understanding (e.g., Harman, *Thought*; ‘Meaning Holism Defended’; Peacocke; Sellars; Wittgenstein). According to this latter line of research, it is partly constitutive of understanding a sentence that one finds all the ‘trivial’ inferences involving the sentence in question to be ‘primitively compelling’. Depending on what is meant by ‘trivial’ here, there are almost surely many such inferences that are not licensed by lexical semantic structure, in the way that the inference corresponding to the conditional in (16) may be. Similarly, there may be structural inferences analogous to that in (16) which speakers do not find ‘trivial’ or ‘primitively compelling’. There is some empirical evidence that there may be such inferences, since speakers often have difficulty identifying lexical semantic structure (cf. Johnson, ‘Tacit and Accessible Understanding’).

(An anonymous reviewer helpfully pointed out to me that a major role for analyticities in philosophy concerns their ability to ground non-empirical truths of mathematics and logic. Depending on the nature of such projects, the nitty-gritty empirical details of human language may prove to be irrelevant. I have also been convinced by Maddy that issues concerning natural languages and ‘logical truths’ and other potential linguistic groundings of mathematics are much more subtle and difficult than is commonly thought.)

In addition to issues of analyticity, lexical semantics is sometimes thought to bear on theories of concepts. Both philosophers and linguists have endorsed the view that conceptual structure can be read off of the linguistic structure of the corresponding expressions. For instance, in philosophy, we find such sentiments as:

The idea that quotidian, middle-level concepts typically have internal structure – definitional, statistical, or whatever – plays a central role in practically every current approach to cognition. Correspondingly, the idea that words that express quotidian, middle-level concepts have complex representations ‘at the semantic level’ is recurrent in linguistics; it is the defining thesis of what is often called ‘lexical semantics’. (Fodor and Lepore, ‘Impossible Words?’ 445; cf. also Peacocke 3 fn. 2; Fodor, ‘Review’ 2)

Similar sentiments are often expressed in linguistics and psychology. For instance, one reads of theories of word structure as being ‘part of the larger system of conceptual structure which underlies human cognitive abilities’ (Kornfilt and Correa 79), and that ‘the basic units out of which a sentential concept is constructed are the concepts expressed by the words in the sentence, that is, lexical concepts’ (Jackendoff, ‘What is a Concept’ 307; cf. also Jackendoff, *Semantic Structures* esp. ch. 1; Miller 18–19). If such sentiments are correct, then we might be able to learn about our concepts – how many we have, which ones we have, how they are structured, etc. – by looking to the structure of language.

Initially, it looks pretty plausible that word-structure and conceptual structure should coincide. If words express concepts and some words are composed of smaller semantic units, then it is reasonable that the concepts expressed by the words are themselves composed of these smaller units as well. In the syntactic realm, this looks right: it’s doubtful we have a simple concept expressed by e.g., *likes brown horses*. So shouldn’t this general idea hold with respect to the internal structure of words too?

This is a difficult question to answer with any precision. As the literature in linguistics and psychology make clear, the individuation of both words and concepts is an unresolved matter, and the internal structure of words and concepts are both ongoing areas of research. A glance at this research suggests that, as a matter of empirical fact, there might be considerably less correspondence between word-structure and concept structure than there might *prima facie* appear to be. On the one hand, a concept could have structure that isn’t present in the corresponding word. Suppose for instance, that concepts turn out to be the kind of highly structured entities that statistically based theories of meaning (e.g., prototype, stereotype, and exemplar theories) postulate (e.g., Medin; Smith). Much of these concepts’ structures will not be linguistically relevant, and indeed may simply not be part of the structure of language. If a bit of conceptual structure has no syntactic, morphological, or phonological effects, and no compositional effects on the way the concept is used as a constituent of

a larger expression's meaning, then that is evidence that the structure is not part of language. So there could be *lots* of structure in our concepts that is not mirrored at all in the structure of our words.

On the other hand, words may well contain linguistic structure that is absent from the corresponding concept. In one sense this is almost trivially true, since words have phonological structure, and concepts presumably don't. But the linguistic lexicon could also contain interpretively relevant information that is restricted to the language processing systems, and which serves no purpose in a psychological theory of concepts. For instance, we saw some evidence that the ability of verbs to appear in the conative construction may have to do with whether the verb (at least in part) expresses a manner of motion – that was why you might *swat at the fly*, but you do not *\*crush at the fly*. But if there is some structural property that encodes the fact that *swat* expresses the manner in which one strikes something, this structure may be restricted to the language faculty. Such a structural property, if it exists, need not also be part of the concept of swatting. Psychologically speaking, the concept of swatting may be an unstructured unit, even though our linguistic abilities recognize some linguistically relevant properties (e.g., manner of motion) in it. This additional structure may have been encoded in the lexical entry for *swat* when this verb was acquired, when the concept of swatting was linked to the verb. That is, as part of how we fit concepts onto words, our linguistic ability may screen the concept for various properties. If it has some of these properties, this information may be recorded as part of the structure of the word, and this structure may serve to partially define the word's grammatical role in the language. (The total interaction between syntax and semantics at the acquisition stage is bound to be substantially more complex than this, however; e.g., Gleitman.)

In short, concepts may have non-linguistic structure, and words may have 'non-conceptual' structure. These considerations suggest that much work needs to be done in clarifying the relation between words and concepts. I am not alone in holding this view. Many researchers (some of whom I have criticized at length) are in agreement about this. Fodor, for instance, admits that 'Getting clear on the word-concept relation is no small matter' ('Review' 34). In a similar vein, Robert Matthews casts doubt on whether our propositional attitudes have a structure that is mirrored in any interesting way by our natural language attitude reports ('Measure of Mind' 2002).

### 3. Conclusion

In this article, we considered the types of semantic structures that linguists often posit within words, the evidence used to justify these posits, and some of the philosophical consequences of this enterprise. I conclude with a couple general remarks.

First, it should be noted that we considered only evidence regarding ordinary English. There are many unresolved issues concerning which generalizations hold only for some languages, which hold for all human languages, and why this happens. For instance, the distribution of the middle construction varies somewhat across languages; it is, e.g., less restricted in Attic Greek than in English (although cf. note 6). In contrast, there is very strong evidence that the causer of an event in a causative verb can only be the verb's syntactic subject: e.g., in no language do we find a verb like *blik* with the meaning that the verb's object caused the verb's subject to break (i.e., \**the vase blikked Bob*). However, there is a great deal of controversy why this strong generalization obtains (e.g., Grimshaw, *Argument Structure*; Dowty, 'Thematic Proto-Roles'; Hale and Keyser, 'On Argument Structure'). While these issues will not be addressed here, they should serve to underscore a central theme of contemporary lexical semantics, which is that the data are very complicated and not particularly well understood at present.<sup>8</sup>

Second, the type of evidence we have reviewed only supports the claim that there is a strong association between certain (roughly 'syntactic') properties of verbs and certain other (roughly 'semantic') properties. I know of no evidence that supports the strengthening of this symmetric claim into Higginbotham's suggestion, quoted in the introduction, that the former properties are 'effects' of the latter ones (470). Indeed, the available evidence does not force the conclusion that there really are two distinct classes of properties (individuated in the relevant way). Moreover, even if there are two such classes, the evidence says little about whether one class is somehow responsible for the other, instead of vice versa, or whether some third type of phenomenon is responsible for both. Similarly, if the relevant 'semantic' properties we have investigated are considered solely in terms of their psychological role, then there may well be no interesting difference between these semantic and syntactic properties at all.

### *Short Biography*

Kent Johnson's general areas of research concern the philosophies of linguistics, psychology, and science. He received his Ph.D. in Philosophy from Rutgers University. He is currently Associate Professor in the Department of Logic and Philosophy of Science at the University of California, Irvine. Johnson's current research concerns the mathematical and conceptual foundations of research methods in linguistics, as well as those of other areas of the social and cognitive sciences. His articles on these topics have appeared in such journals as *Mind and Language*, *Synthese*, *Erkenntnis*, *The Journal of Philosophy*, *Philosophy of Science*, and *Linguistics and Philosophy*.

### Notes

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<sup>1</sup> Incidentally, Pinker suggests (*Learnability and Cognition* 105) that an additional requirement on catenative verbs is that they specify some sort of contact with their object. This is not obvious: *Mary shot at John* is perfectly grammatical, the meaning of *shoot* does not specify a type of contact; cf. also *Mary threw rocks at John*. It may be that Pinker's additional requirement is needed, but I have not found cases where it is.

<sup>2</sup> To my knowledge, this was first noted in Massam, although awareness of this alternation and its semantic relevance goes back at least to Fillmore.

<sup>3</sup> Of course, since a working engine is crucial to the primary function of the car, it would also be natural to describe the situation with *Janet broke the car*. (Contrast this with \**Janet broke the car on the ashtray*.)

<sup>4</sup> For example, we have *Joan cracked the cup, the cup cracked, Joan cracked the cup on the handle*.

<sup>5</sup> A possible counterexample is *read*, as in *The book reads easily*, although cf. Pinker, *Learnability and Cognition*. For discussion on the role of counterexamples in lexical semantics, cf. Johnson, 'Impossible Words' 340–2.

<sup>6</sup> Personally, I believe that the middle construction is much more productive than is frequently thought. In fact, I think that middles form with virtually all change of state verbs (except perhaps verbs of creation and destruction, which I am unsure about), and that they need not express the degree of ease with which the action of the verb can be performed. Many people have remarked on the degraded acceptability of the bare middle: ??*The bread cuts* sounds awkward, although *the bread cuts easily*, and *the bread won't cut* are fine. My own suspicion is that the awkwardness with the bare middle is pragmatic, and the strangeness comes from the fact that announcing that it is possible to cut the bread is typically uninformative, while describing the degree to which it is possible to cut it is not.

<sup>7</sup> It is unclear to me whether *cut* has an inchoative form or not. In my dialect it does, but only in certain environments, such as: *Although it took several tries with a sharp knife, finally the frozen bread cut*. Furthermore, of the verbs that do not have inchoatives, *cut* produces the weakest judgment of unacceptability, and in fact does appear as an intransitive in certain forms *I cut (off) from the group, the lead car cut away from the pack*. Although *cut* specifies an end state of the action of the verb, it also appears to be intrinsically relational. It is easy to imagine something breaking (or opening, or tearing, or snapping) all by itself, with no agent or agent-like force to bring about the effect. But if X becomes cut, then there must be something Y that cuts it (even when in the limiting case X cuts itself). The need for some agent-like force to bring about the cutting may be what makes *cut* resist the inchoative form.

<sup>8</sup> The data are so complex that in the early days of linguistics, it was thought that there might be no end to the semantically relevant grammatical distributions that a particular word entered into. In fact, Harris argued that two words differ in meaning only if they also differ in distribution (Harris 7). Part of the motivation behind this view was the hope that the mysterious intentional notions of semantics might be replaced with the well-understood computational notions of syntax. However, Harris's view was challenged by Bar-Hillel, who argued that Carnap, Tarski, and others had made semantics a legitimate area of scientific inquiry. If semantics can be appealed to, he argued, then words may also be individuated (at least in part) by their semantic properties (Bar-Hillel 235). The examples just given show that syntax and semantics may be much more tightly interwoven than they are in, say first-order logic, where models and the syntax of the language may be specified more or less independently of one another.

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