

Some Issues Involving Internal and External Semantics

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1. Introduction

Emmon Bach's paper (this volume) raises a number of interesting issues, especially the questions "What is quantification, anyway?" and "What is the range of different ways in which quantification can be manifested?" Of course such questions bring up philosophical issues of how we can know whether such-and-such construction in this or that language *really* is or is not quantification.

For example, Bach cites Jelinek (1989) as arguing that Samish (or Straits Salish) does not use noun phrase quantification at all, but rather that it uses auxiliary elements interpreted as unselective quantifiers (Lewis 1975 and Heim 1982). Thus there are no phrases like the English 'all bears', but instead such apparent quantification over all bears is dealt with by quantifying over what bears always do. According to this view, the Samish sentence is more faithfully translated 'Bears always eat fish' than as 'All bears eat fish'. Those of us sharing Quine's Indeterminacy of Translation doubts might raise our eyebrows at this claim.¹ After all, by hypothesis there is no distinction in Samish between different types of quantifiers, and so within the language there is no reason to think the auxiliary ought to be translated as the adverbial quantifier 'always' rather than the nominal quantifier 'all', is there? Well, the evidence for Jelinek's claim really is that it fits into a much broader picture of the Samish language as a whole – that Samish has no contrast between common nouns and verbs, that it is a "pronominal argument language," etc. Once again, though, it would seem that each of these claims themselves is subject to the Quinean doubts, and therefore the whole broader picture can be challenged. This is not the place to do that, however, because in any case, Bach does not take any "Whorfian flying leap" from Jelinek's claim. Rather, he quite sensibly says that any quantificational claim we can make in English can be equivalently expressed in Samish – and conversely, the difference between languages is not in

their expressive power, but in the *ways* in which things are expressed, especially whether things are expressed lexically.

This internal/external semantics distinction is a crucial distinction, and many of the debates that currently rage in semantics could benefit from the realization that the participants just are not talking about the same aspect of semantics: one side asserts something of internal semantics while the other denies it of external semantics. After discussing the distinction and its usefulness, I will consider a topic which might at first seem rather remote from the distinction, but which can benefit from a clearer appreciation of the internal/external semantics distinction.

This topic concerns the issue of *semantic compositionality* – the claim that the meaning of a syntactically complex whole is a function of the meanings of its parts together with the manner in which these parts are combined. Bach (this volume) says, “there is a very firm semantic link between aspects of the external or structural semantics of expressions and the syntactic categories of natural languages.” One way of taking this (but perhaps not the only way) is as a claim that external semantics obeys the principle of semantic compositionality. And if this is what Bach means, then because he is contrasting internal and external semantics here, it is also natural to think of him as denying that internal semantics obeys the compositionality principle.

Another topic which I would very much like to discuss, but for which I have no time, concerns “covert categories.” About such things, Bach says:

Some of the most interesting parts of natural language semantics are those that appear “below” the level of the big categories like verbs, nouns, adjectives and so on, in the various kinds of subcategories that show up in various ways, more or less covert, more or less grammaticized in one language or another. I am thinking here of distinctions like those between mass and count nouns.... The basic conceptual matrix for these and other kinds of distinctions is quite universal, and working out the “logic” of such distinctions in various languages may be the place where linguistics can contribute most to the goal of understanding cognition. By way of illustration, let me just take one set of distinctions to stand in for many.

The “one set of distinctions” that Bach considers is that called “unaccusativity phenomena.” Perhaps on a different occasion I will consider what the study of mass and count nouns might teach us about cognition (for a start, see Pelletier 1991).

2. The Internal/External Semantics Distinction and Its Usefulness

(A) The professional linguist/semanticist who comes from a philosophical logic background or who, some years ago, was trained in linguistics at U. Mass., Stanford-Santa Cruz, U.C.L.A., U. Texas or one of their numerous outposts, will typically identify "real semantics" with external semantics. Ask such a person what is the meaning or semantics of, say, 'tadpole' or 'swim', and we will receive an answer like this: it is a function on possible worlds/information states which, in each possible world/information state, picks out the set of objects which are tadpoles (or: which swim) in that possible world/information state. An outsider might ask what the point of such a semantics is. Is it not circular? Uninformative? Non-instructive? Non-learnable? And furthermore does it not make such "obviously wrong" claims as: an N^0 like 'tadpole' is just as similar in meaning to a V^0 like 'swim' as it is to an N^0 like 'building'. (According to external semantics all three mean some function on possible worlds which picks out some set in each world. The set of tadpoles is "just as similar" to the set of swimmers as it is to the set of buildings.)

But if we make an internal/external semantics distinction, we can readily admit that we have here two different conceptions of semantics. And perhaps both are worth study; but it would be wrong to expect external semantics to do the job of internal semantics.

(B) The professional linguist/semanticist who comes from a philosophy of mind or a psychology background or who was trained in linguistics at U.C.-Berkeley, U.C.-San Diego, Brandeis or one of their numerous outposts, will typically identify "real semantics" with some psychological manifestation – either an individual's psychological representation or with some socially generated and publicly accepted representation. Ask such a person what the meaning of 'tadpole' is and you might get some picture or prototype or stereotype, possibly with collateral information concerning parentage, size, slimness, edibility and future development.² Ask about 'swim' and you will perhaps get a picture of some activity prototypically involving water, locomotion and methods of breathing. An outsider might ask what the point of such a semantics is. What do such pictures have to do with reality?" After all, a picture or prototype (or any representation, more generally) is just an item in some language – a pictorial or representation language. We still require some "hook-up" between this pictorial or representation language and the world. As Lewis put it, "we still don't know the *first* thing about semantics – viz., under what conditions is a sentence true?" (1972, p. 170).

Once again, though, it seems to me that the internal/external semantics distinction can be pressed into service. Prototypes (whether generated by an individual or by society) and representations generally are interesting and worthy of study. Such internal semantics, however, should not be confused with external semantics.

(C) When I read modern "Sapirians" (e.g., Lakoff 1987 and other cognitive grammarians), I sometimes find myself believing that languages could divide the world up in all kinds of different ways. Languages need not have the categories 'mammal' or 'fish'. They might even have a single lexical item for the items we put into the three separate categories 'women', 'fire', and 'dangerous objects'. Languages perhaps need not have the concept of 'enduring physical object' (which can be continuously referred to, despite its having undergone vast changes). They might instead have lexically instantiated notions of 'manifestations-of-rabbithood', or maybe of 'instantaneous stage of *x*', and (what we call) objects might be describable only by lengthy combinations of these lexically manifested concepts. Perhaps they might only have the concept of 'event' as a lexical primitive, and then (what we call) objects have to somehow be described by circumlocution as such-and-such a portion of an event. Indeed, maybe even the concept or meaning of such a basic notion as time might be different between languages. Perhaps one language views time as 'future in front of us, past behind us', while another views time as 'our being able to see all that has happened, and the unseen future coming at us from behind'.

But then I catch myself and say, like Sapir, that everyone and all cultures express *something* by language. So they all want to indicate a topic/subject and to say something about this topic/subject. "It might be done in an unusual way," I say to myself in such moments, "but any statement of theirs can always be analyzed as a topic/subject and a predicate. So, such quasi-linguistic items are universal across languages and are not bound to individual or cultural psychology."

Once again it seems to me that the external/internal semantics distinction can help here, although exactly how is less than clear.

3. Issues of Compositionality

The Principle of Semantic Compositionality is the principle that the meaning of a complex expression is a function of (and only of) its parts together with the method by which those parts are combined. As stated, the principle is vague or underspecified at a number of points, such as: "what counts as a part," "what is a meaning," "what kind of a function is allowed" and the like. In this very general form, The Principle makes

no assumptions about what the parts of a complex expression are, nor does it put any restrictions on what constitutes the function of parts-and-whole. Nor does it make any assumptions about what is meaning, nor does it say how to tell whether two expressions have the same or different meanings. Such vagueness and underspecification, however, have not stopped some people from treating The Principle as obviously true, true almost by definition. Nor has it stopped some others from attacking it both on empirical grounds and on theoretico-methodological grounds.

As an empirical comment on the sociology of linguists and philosophers, let me just point out that those who support The Principle are philosophical logicians and linguists from U. Mass./ Stanford/U. C.-Santa Cruz/U. Texas/etc., whereas those who oppose The Principle are cognitive scientists and linguists from U. C.- Berkeley/U. C.- San Diego/Brandeis/etc. Generally, the supporters trace intellectual heritage through Montague; the opponents call themselves cognitive grammarians. Although there are certainly substantive differences within each of these groups on all sorts of matters (including even issues concerning compositionality), for terminological convenience I will call the two groups 'U. Mass. theorists' and 'Berkeley theorists'.

The existence of the two divergent groups described above suggests to me a "Cognitive Science Compromise": both the supporters and the opponents are right about the Principle of Semantic Compositionality—but they are talking about different notions of semantics. The U. Mass. notion of semantics (i.e., external semantics) is compositional. The Berkeley notion of semantics (i.e., internal semantics) is *not* compositional.

Although in general I am a great believer in cognitive science compromises in which everyone can be right, in this case I would rather propose "Pelletier's Middle Road": both U. Mass. and Berkeley theorists are *wrong* about The Principle of Semantic Compositionality. Internal semantics is compositional; but external semantics is *not* compositional.

We cannot really discuss here the complex issue of compositionality in any detail or with any care. So, I must just content myself with caricatures and with discussing only the "weakest" ("strongest"?) form of compositionality: that very general characterization given above. Any further restrictions on compositionality, such as "the meanings must be regular across constructions" or "the allowable functions must be systematic" and the like, are not directly under discussion. (It might be noted, however, that if the general form of compositionality is false, as I argue it is for external semantics, then it must also be incorrect to affirm any theory of general compositionality which is also regular and systematic.)

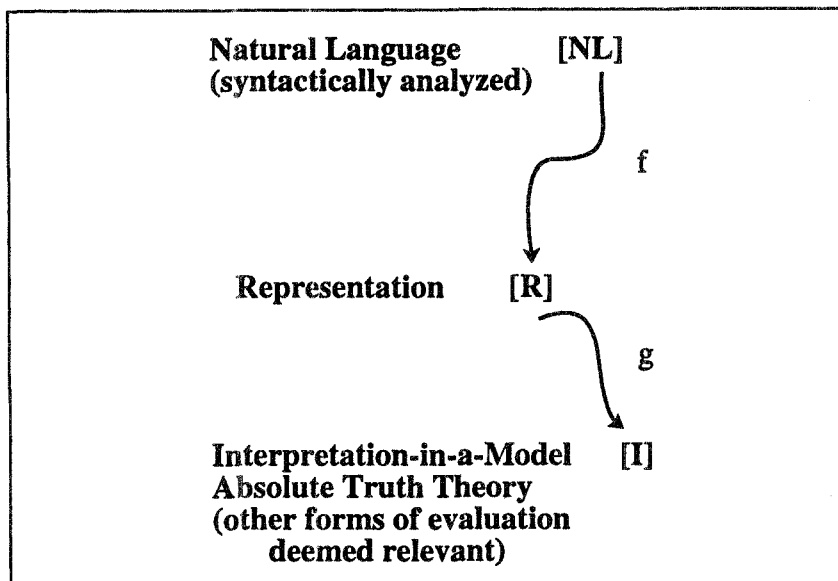


Figure 1: A picture familiar from the philosophy of language and logic, and from many linguistic theories.

Figure 1 gives a generic description of the portion of linguistic theory that I wish to examine. It is a picture familiar from philosophy of language and logic, and from many different linguistic theories. One is given a syntactically analyzed natural language, and correlates elements of it (typically sentences) with some representation. And then one further "interprets" this representation with respect to a model or "the world," or whatever is deemed relevant.

The (stereotypical) proponents of the U. Mass. theory are *Eliminativists* (see Figure 2). The ' $f \bullet g$ ' indicates some way of combining the output of f to form an input to g . Since the (stereotyped) eliminativists believe f and g to be functions, they tend to believe that ' $\bullet$ ' designates function composition.

And the (stereotyped) proponents of the Berkeley theory are *Straight Representationalists*, where there simply is no level of interpretation beyond the level of representation. (See Figure 3.)

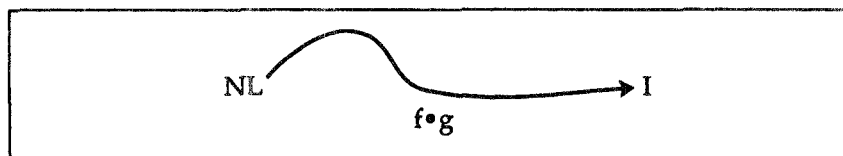


Figure 2: Eliminativism as a way to remove the level of representation.

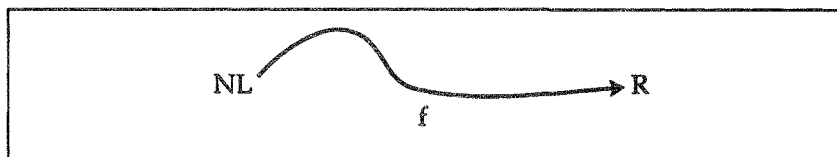


Figure 3: Straight representation as a way to remove the level of interpretation.

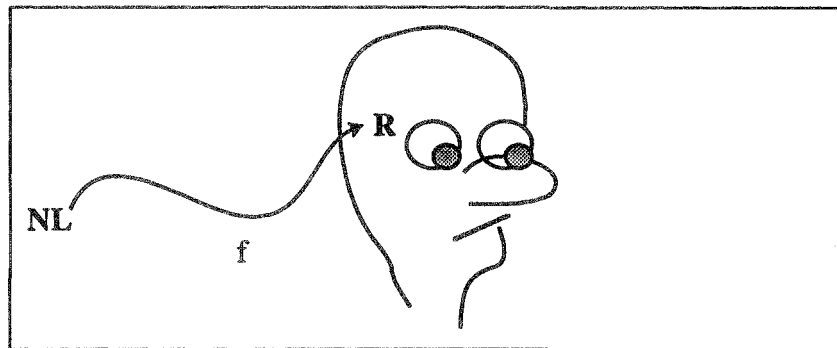


Figure 4: Straight mental representation as a particular kind of representationalism.

In fact, most Berkeleians are *Straight Mental Representationalists* (although the feature of mentalness will not enter into my further discussion). (See Figure 4.)

The reader will notice that there is no structural difference between eliminativism and straight representationalism (Figures 2 and 3). Both postulate a (syntactically analyzed) natural language and some semantic correlate.

We should note just how implausible it is to add The Principle of Semantic Compositionality to this picture. If compositionality were true, then the relation between NL and the semantics *S* (either *I* or *R*, depending on the theory under discussion) would be a *function*. That is, for each item from NL there would be exactly one³ counterpart in *S*. In other words, there would be no ambiguity except for what could be traced to individual lexical items. What might otherwise appear to be ambiguity would be traced to differing items of NL – i.e., “It appears that there is just one item in NL which has these two meanings, but really there are two different sentences of NL here.” This is the strategy taken by Montague, for instance, in explaining why it appears that sentence (1) below has two meanings: one in which Kim wants to marry some particular person who happens to be a Dane, and another in which Kim has a condition on who is marriageable – the person must be a Dane.

1. Kim wants to marry a Dane.

Rather than say that (1) is ambiguous, Montague says that there are in fact two sentences here, distinguished by different syntactic rules being applied at different points in its derivation. (The quantifying-in rules being applied at different times. See Montague 1973, especially p. 255.)

Adoption of compositionality requires the wholesale use of this strategy. There simply can be no ambiguity at all (other than lexical ambiguity) in either eliminativism or direct representationalism, if one adds compositionality. There can never be cases of one and the same syntactic structure, using identical basic parts, but where there are two or more different meanings.⁴ But is that not all rather silly? Are not each of the following sentences counter-examples to that position, and are there not a great many more examples?⁵ Do not each of sentences (2a) to (2e) have exactly one syntactic analysis, and yet are they not also ambiguous?

- 2a. Every linguist in the room knows two languages.
- 2b. John wondered when Alice said she would leave.
- 2c. When Alice rode a bicycle, she went to school.
- 2d. The philosophers lifted the piano.
- 2e. The Canadian family used less water last year than the preceding year.

To maintain the compositionality principle, theorists have resorted to a number of devices which are all more or less unmotivated (except to maintain the principle): Montogovian "quantifying-in" rules, "traces," "gaps," "quantifier raising" rules, distributivity/collectivity features, genericity features and many more.

Eliminativism and direct representationalism, when combined with compositionality,⁶ are also incompatible with any form of synonymy – lexical (e.g., 'attorney' and 'lawyer'), phrasal (e.g., 'a circle' and 'a locus of all points on a plane equidistant from a given point'), and sentential (e.g., 'Dentists usually need to hire an attorney' and 'Tooth doctors commonly require the professional services of a lawyer'). The argument for this is a *reductio*. Assume compositionality to be true, and consider (for example) the cited instance of sentence ambiguity. If 'Dentists usually need to hire an attorney' meant the same as 'Tooth doctors commonly require the professional services of a lawyer', then (3a) below would have to mean the same as (3b) – since they were put together by the same rules from parts that mean the same, and the principle of compositionality says that this is all that comes into play when considering the meaning of the whole.

- 3a. Kim believes that dentists usually need to hire an attorney.
- 3b. Kim believes that tooth doctors commonly require the professional services of a lawyer.

But it is quite clear that Kim might believe one of the embedded sentences without believing the other (one can make up all kinds of stories about how this might come about), and thus (3a) might be true while (3b) is false. But from this it would follow that (3a) and (3b) do *not* mean the same thing. Therefore compositionality is incompatible with sentential synonymy. This argument can be extended to phrasal and lexical synonymy. If 'a circle' means the same as 'a locus of all points on a plane equidistant from a given point', then sentences (4a) and (4b) below would mean the same, since they are formed/analyzed by the same rules from parts that mean the same (this is all that is required by the principle of compositionality to guarantee sameness of meaning):

- 4a. Saying a circle is a circle is the same as saying a circle is a circle.
- 4b. Saying a circle is a circle is the same as saying a circle is a locus of all points on a plane equidistant from a given point.

But since (4a) and (4b) mean the same (which some might already find objectionable), it follows that (5a) and (5b) must mean the same, since they are formed/analyzed by the same rules from parts that mean the same, which is all that is required by the principle of compositionality to guarantee sameness of meaning:

- 5a. Kim believes that saying a circle is a circle is the same as saying a circle is a circle.
- 5b. Kim believes that saying a circle is a circle is the same as saying a circle is a locus of all points on a plane equidistant from a given point.

We know, however, that Kim might believe one and not the other; thus one of (5a) and (5b) can be true while the other is false, and therefore (5a) and (5b) *cannot* mean the same – contradicting the principle of semantic compositionality.

Though obviously the argument can be extended to lexical synonymy, I will not do so here. Instead I ask: can it really be true that there is no synonymy of any sort in natural language? How could language ever be learned if that were true? How could we ever explain person A to person B by "re-phrasing his words"?

We have seen that neither eliminativism nor straight representationism can embrace semantic compositionality if they also wish to hold on to the existence of either ambiguity or synonymy. And it is quite clear that no principle so highly theoretical should be allowed to overturn the manifest facts of language such as the existence of synonymy and ambiguity. But now note this important observation: the sort of semantic phenomena we are here considering concern *external semantics* exclusively. All this worry over the existence of a function from syntactically analyzed natural language into some semantic representation, and all the worry over ambiguity and synonymy, concerns "what the various classes of syntactic items do in the economy of building up denotations for complex expressions," to use Bach's characterization (this volume) of external semantics. These phenomena do not at all concern themselves with "the kinds of things that are included in the denotations of syntactic items" (to use his characterization of internal semantics). From this I conclude that *external semantics does not obey the principle of semantic compositionality*. So, although there might be "a very firm link between aspects of the external or structural semantics of expressions and the syntactic categories of natural languages" (as Bach characterizes the main argument of his paper), this very firm link is *not* semantic compositionality, nor is it anything which would imply semantic compositionality (e.g., the "rule-to-rule hypothesis").

Though my discussion of compositionality's interplay with external semantics has been brief, I will now discuss even more briefly and still less thoroughly compositionality's interplay with internal semantics. Recall that the Berkelean conception of a semantic value is a prototype or stereotype or picture (etc.), and that this may be either "individual" or "social." This is the *internal* semantic value, to use Bach's terminology. Let us consider prototype formation as a particular version of this sort of theory. Such a semantic item is either atomic or is composed of (mental? prototypical?) parts. In the latter case, the parts of the compound prototype and how these parts are assembled simply define the prototype. How could this sort of construction (or analysis) of a whole from its very own parts *fail* to be compositional?

Furthermore, if we were to assume that somehow the compound prototypes might fail to be some function of their parts and of the manner in which these parts are put together, then we will find ourselves unable to account for meaning-learning. How could we, as meaning-learners, ever come to understand complex prototype-meanings unless we did so on the basis of having already understood the simpler parts of the prototype and the ways in which these parts are put together to form the larger prototype? (Well, one way would be for us just to learn the

new prototype as an unanalyzed whole. But that would be to treat the larger prototype as not really being built up from its parts – as being itself an atomic prototype. And surely not all our meanings can be atomic. Surely there are too many meanings to learn, for us to do this with all of them. Even if there is not literally an infinite number of them that must be learned, there are still too many meanings for each to be learned as atomic. In any case, introspection shows that many of our mental/social meanings *are* functionally composed from simpler parts.) In addition to requiring compositionality in order to learn the internal semantics of complex items, we require compositionality to understand the internal semantics of novel combinations of natural language. Once again, even if there is not literally an infinite number of things that need to be understood, there are still too many of these novel combinations of the simpler prototypes for us to claim that they can all be understood as atomic concepts. Although this novelty argument is commonly used to argue for compositionality of external semantics (e.g., by Davidson and his followers), its true force comes more to the fore when we consider internal rather than external semantics.

So in light of the foregoing, what would a prototype which violates compositionality look like, according to the Berkeleians? Langacker (1987) gives an example of such a prototype (and refers to it throughout as a proof of the falsity of compositionality):

Suppose that at a particularly popular American football game, say a Superbowl, the organizers staged a half-time extravaganza which included a young woman draped in an American flag climbing a flagpole and then swinging down to the tune of some particularly patriotic music. At the end of this mesmerizing spectacle, the announcer says "Ladies and gentlemen, let's hear it for our patriotic pole-climber!!" So much in keeping with the psyche of the country is this show that *all* the football games came to have such a show at half-time, and this event (and the woman who participates) became known as 'the patriotic pole-climb(er)'.⁷

The reason that Langacker perceives this to be a violation of compositionality is that (after the custom has been established) he sees something in the (mental? social?) prototype of 'patriotic pole-climber' which is not in the (mental? social?) prototypes of the three individual terms – 'patriotic', 'pole' and 'climber' – and also not in the way these were combined (mentally? socially?).⁸ How does Langacker know this? Well, he has seen the prototype of 'patriotic' (etc.) in other circumstances, and there is something in the present new circumstance which does not occur in any of the old ones. And he has seen the effect of this sort of mental combination of prototypes before (the kind used here to put

together the three simpler prototypes to form the complex), and he does not see how that effect could possibly generate the present "something new" in the complex.

But when Langacker's reasoning is put like this, we see that it has no force at all against the proponent of compositionality. The compositionalist merely asserts that, in the given example, the prototypes for 'patriotic', etc., do in fact combine so as to yield precisely the sort of prototype required. (The compositionalist might remind Langacker that part of the "stuff" that goes into forming this prototype has to do with the phrase's origin in the half-time entertainment of a football game. And it may be this part which is being ignored by Langacker when he says that he finds something in the complex prototype which he cannot find in any of the parts.) Of course compositionists have no *argument* for this position—they merely assert that it is possible, and that nothing Langacker has said has shown otherwise. The patriotic pole-climber just is not the knock-down example of non-compositionality that Langacker pretends it is.

The prototype-learning argument and the prototype-understanding argument convince me that *internal semantics does obey the principle of semantic compositionality*. And there has been no evidence offered to support the claim that complex mental or social meanings are not compositional.

4. A Concluding Remark

This concludes my brief remarks on The Principle of Semantic Compositionality that have been occasioned by Bach's discussion of the distinction between internal and external semantics. As I said at the outset, his paper raises many other topics that are also worthy of discussion (I hope to follow up on some of them at another time). Bach's paper has the features of all his earlier ones: it is chock-full of extremely interesting, informative and provocative remarks.

Notes

- 1 The implicit claim that all quantification can be reduced to one type might also raise eyebrows. Is there not a difference between the two types of quantifiers even in the simple example cited? Does not 'Bears always eat fish' imply that bears are always eating? But does not 'All bears eat fish' instead say that each bear has the habit/ability/propensity to eat fish? And if these two senses can be distinguished in Samish (as surely they can be), then is there not in fact a nominal-quantifier-versus-adverbial-quantifier distinction

available in Samish? So what would it mean to say that Samish "has no noun phrase quantification at all" (as Bach puts it)?

- 2 Pictures, prototypes and stereotypes are not the only sorts of representations such theorists might find acceptable. I use them simply as easy-to-state examples, and intend my discussion to generalize to other possible representations.
- 3 We assume here that the function is *total* – that each item in NL in fact does have some correlate in S. The theory could still obey the compositionality principle without this assumption; the function relating NL and S might be *partial*. In this case some members of NL would not have a meaning, but those that did have a meaning would have exactly one counterpart in S.
- 4 Not like 'Teaching students can provide a learning experience', which has two obviously distinct syntactic analyses. I mean instead that there cannot be cases where the identical syntactic analysis yields two different meanings.
- 5 For those having difficulty seeing the ambiguities: (a) is ambiguous between each linguist's knowing some two or other languages, versus all linguists knowing the same two; (b) is ambiguous between John's wondering about the time of Alice's departure, versus wondering when Alice said it; (c) is ambiguous between 'In the past, on those days that Alice rode a bicycle she rode it to school', versus 'In that period of time in the past when Alice was a bicycle-rider, during that period she also attended school'; (d) is ambiguous between each of the philosophers lifting the piano, versus their doing it all together; and (e) is ambiguous between the total water used by all Canadian families this year being less than last year, versus the water used by the average Canadian family this year being less than that used by the average Canadian family last year. (With regard to [2e], compare the sentence 'The American consumer purchased 8,000 BMWs last year', where it is clearly that the sum total of all American consumer purchases included 8,000 BMWs, with 'The American consumer purchased 1.9 video cassettes last year', where it is clear that the average American consumer purchased 1.9 video cassettes.)
- 6 Plus a few other obviously true assumptions. I will assume: (a) that if sentence X is true and sentence Y is false, then X and Y cannot have the same meaning; (b) that all sentences of the form 'Kim believes that S' (where 'S' is a sentence) are formed/analyzed by the same syntactic rule(s) from 'Kim', 'believes' and 'that', plus whatever went into the formation/analysis of S; (c) that for any two syntactically distinct sentences, it is possible to imagine a person who believes one of them but disbelieves the other.
- 7 The passage cited is a shortened paraphrase of Langacker's original.
- 8 Something about social practices, perhaps. Or something about the esteem in which such people are held. And perhaps something about its effect on the future history of American football.

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