

Compositionality and blending: semantic composition in a cognitively realistic framework

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Compositionality is a central fact of language, and one which has been given inadequate treatment in formal semantic models. Cognitive linguistics has been sensitive to the need for complex and diverse treatments of the structure of linguistic categories, as required by the complexity of actual cognitive categorization and linguistic usage. Attendant on a more complex theory of meaning, however, are the problems of describing compositional combinations of these complex semantic entities.

This paper uses Fauconnier and Turner's (1995, 1996, 1998) theory of Mental Space Blending to describe the mechanisms of linguistic compositionality involved specifically in the English Adjective-Noun modification construction. An analysis in terms of blended spaces allows us to give a simple and effective treatment of apparently intractable cases such as *likely candidate* or *usual suspect*. Among the entities accessible for blending must be the speaker's epistemic and speech-act spaces (cf. Sweetser 1990, Dancygier and Sweetser 1996). A blended spaces treatment also, as it turns out, permits us to unpack a host of unacknowledged but genuine possibilities for interpretation of supposedly more tractable examples such as *red apple*. Since even these "simple" cases turn out to require a broad range of cognitive mechanisms (including metaphor, metonymy, frames, mental spaces, active zones and profiling, and implicit evocation of the speaker's epistemic and communicative spaces), we have surely lost no economy in making reference to these same mechanisms in an account of *likely*. What we stand to gain is a more satisfying and unified treatment of adjectival modification, and potentially of compositionality in general.

1. Introduction. Hunting for *likely candidates* for an analysis of *fake gun* in a theory with *rampant polysemy*: the *usual suspects* won't do.

What do we do when we put together a "simple" pairing of semantic elements like the senses of a modifying adjective and a noun? We know that even *red pencil* and *red apple* do not refer to the simple intersection of pencils or apples with red things. We know that *fake guns* may well be real objects, and hence are not the intersection of guns and fake things (cf. Vendler 1967); *good parents* may be bad accountants or bad swimmers, and thus are not plausibly the intersection of independently-determined sets of parents and good things (cf. Austin 1964). To bring more complex and less-discussed examples to the fore, combinations such as *likely candidate*, *rampant polysemy*, *usual suspect* or *professional suicide* pose problems that are perhaps even more severe than some of the ones previously mentioned. Examining such cases has eliminated the plausibility of a simple set-intersection theory of the semantic relationship of noun with modifying adjective. This result in itself is not any particular surprise, since the last twenty years of cognitive semantic research as a whole has argued strongly against the plausibility of individual word-meanings referring to membership in classical sets.¹ But the process of understanding the combination of these non-classical categories into non-truth-functional larger semantic units is a serious challenge for the cognitive linguist. My goal here is not to pretend to offer a complete and correct theory of semantic compositionality, but to show how far we have come towards meeting some parts of that challenge, and make some suggestions as to how we can go further.

First, I shall lay out examples showing that we need (at least) all of the major semantic mechanisms proposed in recent cognitive linguistic theories, merely to account for the combinatorial semantics of English Adjective-Noun (henceforth A-N) modification. Such a complexity is a problem for any theory which does not have equivalent mechanisms available to give an account of the relevant data. And my claim may gain some initial plausibility from the fact that there has so far been little agreement among linguists as to any general treatment of the

semantics of such basic constructions as A-N modifications (whether "compounds" or "free") or Noun-Noun compounds;² the variability and complexity of these constructions' interpretation suggests that a variety of mechanisms may be involved in their semantic composition. (The same is surely true of any number of other "simple" constructions, but we will focus for the moment on these.) Further, "easy" cases such as *red N* require so much complex interpretation that there is no tidy division to be drawn between them and the "tough" cases like *fake N*, *likely N*, or *proverbial N*.

Next, I shall present some more complex cases, such as *safe N*, and demonstrate that the mechanisms postulated for *red N* are also sufficient to account for these. The frames involved in the meaning of *safe* will be used as an example of the ways in which compositionality involves flexible matching between frame-evoked roles and individuals referred to.

Then I shall try to lay out a general compositional formula for the interpretation of A-N constructions in English, drawing on the work of a number of cognitive linguists. My formula will be based on Fauconnier and Turner's (1995, 1996, 1998) idea of Blended Spaces, and I put forward this case study as a rich example of the ways in which mental space structures, inter-space mappings and counterpart relationships interact with frames, metonymic and categorial relationships, active zone phenomena, profiling, viewpoint, and speech-act interactional context. It is no secret that such interaction exists—but it has perhaps been most fully discussed in the context of structures which are recognized as involving clausal (or higher-level) interpretation: conjunction, modals, anaphora, sentential modifiers, verb tense and aspect, and so on. However, it seems very clear that the semantics of nominal determiners are closely tied to mental space structure; the negotiation of mental space structure seems in fact to be the central function of definite and indefinite articles (Fauconnier 1985; Epstein 1994, 1996). Indeed, all of the forms involved in nominal grounding (in Langacker's [1987, 1990, 1991] sense) seem to be involved in representing aspects of viewpoint and mental space location. But articles and demonstratives have been recognized in most theories as linked to the broader discourse context, and therefore not interpret-

able exclusively on the basis of purely local linguistic content—while adjectival modification has not been clearly recognized as being directly linked to such broader structure.

Finally, my analysis of A-N constructions will turn out to require as background an understanding of multiple, implicitly available mental spaces, including a space representing the current speech interaction and a space representing the speaker's ongoing epistemic processes. I have argued extensively elsewhere for the necessity of incorporating such spaces into our semantic analyses (cf. Sweetser 1990, Dancygier and Sweetser 1996).³ Other work outside the framework of Mental Spaces theory has given us compelling evidence of the need to bring the speaker's mental processes and the speech interaction: for example, Traugott (1982, 1988, 1989, 1995; Hopper and Traugott 1993) treats grammaticalization as centrally involving subjectification (defined as the integration of the speaker and the speech setting into the meaning); and Langacker's (1991a) treatment of subjectivity crucially involves a cline between implicit and explicit reference to the speech-interactive context and to the speaker's viewpoint, as a pervasive aspect of lexical and grammatical semantics as well as of contextual interpretation. And work within Mental Spaces theory has of course been based from the start on the need to bring a speaker's "base" space into any space-building process, as well as to map the negotiation between that space and others.⁴ There can be no loss of economy in adding the A-N construction to the list of those whose interpretation may require implicit reference to this complex of speaker-related spaces; and this addition strengthens the impression that such implicit reference pervades the interpretive processes of English speakers, with respect to the most basic constructions of their grammar.

2. What is compositional depends on what semantics is

I do not know any linguists who see semantics as intrinsically non-compositional, although there may possibly be philosophers or literary critics who hold such a view. Linguists all agree, and so does the

average lay person, that the reason *The cat stole the hat* means something different from *The cat ate the hat* is that *stole* and *ate* make different contributions to the interpretation of the whole, and that those contributions are systematically related to the usual conventional ranges of interpretations of *eat* and *steal* in other possible uses by English speakers. We may disagree about major related issues: for example, the extent to which idioms are processed compositionally (whether as well as, or instead of, being processed as units); the extent to which it is important to talk about meanings of syntactic constructions; the relationship between "semantic" and "pragmatic" components of a linguistically conveyed message; the relationship between linguistic interpretation and general reasoning processes of context-based inference; or the assessment of what proportion of everyday utterance-content is produced and processed by accessing already-present routines, as opposed to by brand-new composition of elements. But the basic fact of compositionality remains, and remains also for more apparently complicated cases than those involving cats, hats, and mats.

All of the last two decades of work in cognitive linguistics has radically changed our understanding of semantics. What has emerged is a semantics which is attempting to be cognitively realistic—it takes seriously the need for semantic categories to be humanly accessible and learnable, and for them to be processed against the kinds of frameworks genuinely involved in the process of understanding. As a result, there is now a community of semanticists who no longer think that meaning is a set of binary features, corresponding to objective truth-conditional relationships between form and real world. We still take seriously, as any linguist must, the need to account for the compositional nature of linguistic meaning. But we recognize that the task is a far more difficult and complex one than we might once have thought, since the meanings being put together are so much richer and less rigid than we might have imagined twenty-five years ago. The work of researchers such as Langacker (1987, 1990, 1991), Lakoff (1987), Goldberg (1995, 1997), Fillmore, Kay, and O'Connor (1988), and Kay and Fillmore (1999) on the semantics of constructions has explored new issues in the relationship between the meaning of a

larger construction as a whole and the meanings of the parts of the construction. Langacker has insightfully set out other complexities of the composition of meaning, giving us concepts such as *active zone* and *elaboration*. Fauconnier's theory of Mental Spaces (Fauconnier 1985, 1997; Fauconnier and Sweetser 1996) has given us a language to talk about how linguistic forms may refer to counterparts of the primary described referent, as well as functioning to instruct the hearer about space-construction.

I shall not here be primarily concerned with the problem of assigning meaning to larger constructions as wholes, rather than to words or morphemes: I shall be working instead on the complexity of constructing compositional meaning. Some very brief examples will show how important frames, active zones, and mental spaces are in such construction. Frames (see Fillmore 1982, 1985; Fillmore and Atkins 1992) are schematic relational structures which represent the connected roles and relations that constitute the background to some semantic or conceptual category; *buy*, *sell*, *goods*, and *price* all evoke the same "commercial event" frame, but highlight or refer to different pieces of that frame. Frame structure is a powerful cognitive mechanism which underlies many instances of meaning extension: A metonymic usage such as *the pen is mightier than the sword* relies on the tight connection between certain action frames and the instruments used in those frames, which enables *pen* and *sword* to refer to those action frames and not only to the physical objects.

Like frames, active-zone phenomena are pervasive in language. As an example, let us take Langacker's (1991) discussion of the word *pencil*. When I say *I put the pencil on the desk*, my hearer is likely to understand that the whole pencil was put on top of the desk; but when I say *I put the pencil in the pencil-sharpener*, the hearer will probably understand me to mean that I inserted only the sharpenable writing end of the pencil into the sharpener. In this second case, the writing end of the pencil is the contextually relevant *active zone*, and is taken as the referent of the phrase *the pencil*.

Mental spaces, the third major theoretical construct I shall be using in my account of compositionality, are an extremely general mechanism for describing the interconnections between parts of complex

conceptual structures. Although mental spaces may correspond to the sorts of structures which might in other theories be analyzed as possible worlds (for example, conditional "spaces" might be so treated), in other instances a mental space corresponds to a belief state, or to a visual representation, or to something more like a semantic domain. The crucial characteristic of a mental space is that there can be systematic cognitive mappings between it and other mental spaces, with consequences for (inter alia) reference. For example, because of the mappings between our understanding of reality and our understanding of paintings and photographs and plays, it is normal to use the name of a person to refer to the representation of that person in a painting or photograph or play. Mental spaces have internal structure which includes frame and active-zone structure; one could view Fillmore's commercial event frame as a rather schematic (partially-filled) and conventional mental space, or as a possible internal structural component of more filled-out mental spaces.

Recently, Fauconnier and Turner (1995, 1996, 1998) have suggested that Noun-Noun compounds in English can best be accounted for as involving *Blended Spaces*; that is, each noun evokes a space structured by some appropriate frame, and the meaning of the whole is a successful blending of the two spaces involved. For example, in *land yacht* (used to refer to a large expensive car), the blending results in a new space wherein we imagine a land vehicle (inheriting various features from our normal framing of land transportation) which is in some ways the counterpart of a yacht (in our framing of water transportation): personally owned, expensive, luxurious, status-marking, not primarily functioning for practical transportation, and so on. Crucially a *land yacht* is not a kind of *yacht*. Fauconnier and Turner's work should be particularly welcome, since the best and most honest efforts of past linguistic analysts have vividly laid out the unpredictability and apparently unlimited semantic flexibility of the English Noun-Noun compound, without making much progress at general mechanisms for the modelling of that flexibility; an exception to this is Ryder (1994), who makes use of frames in setting up her flexible templates for Noun-Noun compound meaning, and who might well see Fauconnier and Turner as proposing an analysis which is

ance "It's red," said on examining a new baby's hair color.) Another possibility is that the interpretation of all modification constructions is pragmatic rather than semantic—which opens the door to further questions, so that in the end one would have to say that all meaning-composition is pragmatic.⁷

My own feeling is that there is little point to insistence on modularity at the cost of generalization. Inasmuch as we make use of grammatical and lexical conventions in interpreting meaning compositionally (e.g., our knowledge about the semantics of *red*, and about the A-N construction), we are using information not dependent specifically on one context of interpretation. On the other hand, interpretation is never truly context-free; because form only very partially specifies ("prompts") meaning construction,⁸ we can only actually interpret complex linguistic forms by constructing some possible use or uses of those forms to convey meaning. "Neutral-context" interpretations are simply those which are so accessible from our entrenched conceptual structures that their construction requires very little help from a specific context in the outside world. Whether we call it semantics or pragmatics, such construction is part of the basic linguistic capacity to deal with compositional meaning in a systematic way.

3. Blending, overlap and redundancy

Let us examine a so-called simple case of A-N compositional semantics, *red ball*. One particular interpretation seems, without context, to spring to mind: a ball whose surface material is red. Of course, this is illusory: In the right context, the phrase can easily be imagined to mean a ball (from among a group of balls which are all painted blue on the surface) whose interior constituent material is red. Or a ball which is distinguished from other balls by the fact that it is filled with red paint instead of some other color of paint; or the ball which has a red mark on it, instead of otherwise similar balls marked with different colors. Or the ball belonging to the team which wears red uniforms. As Langacker (1987, 1990, 1991) has made clear to us, all semantic

compatible with her basic approach.⁶ Coulson and Fauconnier (in press) have further suggested that in the semantics of an adjective like *fake*, there are automatically two mental spaces involved, before even blending it with any other semantics (such as that of a noun): the mental space of a dupe who sees the object as a member of some class (e.g., a gun), and that of the trickster or some more knowledgeable person who knows it is not a gun but is passing it off as one.

All of this is in evident contrast with traditional "building-block" ideas of semantic compositionality. Instead of each word or morpheme always representing the same rigid and stable semantic chunk or building-block, the same word can represent very different complex meaning structures in different contexts, and may alter flexibly depending on the meanings surrounding it. *Shakespeare* can refer to a book rather than to the author, *pencil* can refer to an active zone of the pencil, and *yacht* may not refer to a boat if preceded by *land*. Instead of making only complementary contributions to the larger compositional meaning (as blocks cannot overlap in a larger physical structure), meanings of constituents can and do overlap extensively. And instead of being separate from the builders, as blocks are, meaning structures frequently incorporate models of aspects of the meaning-constructors' interaction and viewpoints; sometimes, as we shall see, they do this without any explicit mention of the speaker and hearer.

Evidently, many analysts who see semantics and pragmatics as more separate from each other would see many of the aspects of interpretation which I have been discussing as pragmatic, not semantic. But it seems impossible to maintain this viewpoint, while giving a non-circular definition of semantics. First of all, in the A-N construction, neither the meaning of the Adjective nor that of the Noun is independent of the other's meaning. (Recall that *red hair* is not the color which *red* evokes in non-hair-related contexts, and a *stone lion* is not a lion, just as—to give a N-N example as well—a *land yacht* is not a *yacht*.) One possibility, then, is that special semantic processes apply in these cases, which replicate the pragmatically based interpretive processes seen elsewhere (e.g., the apparently contextually prompted non-focal-red reading given to the word *red* in the utter-

elaboration relationships depend on the identification of an appropriate *active zone* of the elaborated concept. The active zone of the ball may be its exterior surface—indeed, that is one highly conventionalized usage, which therefore springs readily to speakers' minds without much extra help. But it can also readily be any other relevant part of the frame associated with the ball, whatever frame has been set up in the context—so long as one can imagine that part of the frame as being the active zone which the speaker intends to elaborate by labeling it *red*.

Our prototypes and frames for *ball* and *red* are also relevant to the senses available for the phrase *red ball*. First of all, we are likely (unless otherwise informed) to imagine an object which is close to a prototypical "ball" shape (i.e., spherical), and close to the central or focal shade of red.⁹ Knowing that balls are human-made objects which can be artificially colored is what influences us to readily access a sense of *red* that may be close to focal red, rather than the senses we might have accessed most immediately for *red hair* or *red apple*. (Indeed, so strong is this framing effect that it is quite difficult to imagine calling a ball *red* rather than *brown*, if it were in the color range of auburn hair.) And one might suppose further that many hearers would begin by imagining a ball used for some child's game or adult sport, rather than other ball-shaped objects such as a glass ball hung on a Christmas tree, or a candy ball.

What makes us initially feel that the red-surface sense of *red ball* is "simple" and regular and objective—that we access it without needing to engage in choosing a perspective or an active zone, or in flexibly negotiating meaning between the two word senses and between senses and context—is not merely the existence of an already conventionalized sense for the phrase, or the guidance we are given by prototypes and frames. It is also the fact that there is considerable overlap between the frames involved in the semantics of *red* and of *ball*. Even if we have to choose an active zone, balls are already physical objects, have surfaces, are made up of constituent material, and so on—and the color red can be imagined as applying to some part of them or to some related object in their physical environment. Active zones are not far to seek. Figure 1 gives a partial blended-

spaces analysis of the interpretation of *red ball* as meaning a ball (perhaps a rubber ball, or other game ball) whose exterior surface is red. Compositional interpretation of the phrase requires blending of the two input spaces, one contributed by *red* and the other by *ball*, to create a coherent blended space. At first glance, the two spaces are relatively non-overlapping in structure: One refers to a color, the other to a three-dimensional solid object. But colors, of course, are conceptualized (conceptually framed) as being colors of visually perceived surfaces of objects; thus one obvious mapping between the two spaces is to map the ball onto the object whose surface is visually perceived as exhibiting the color red.

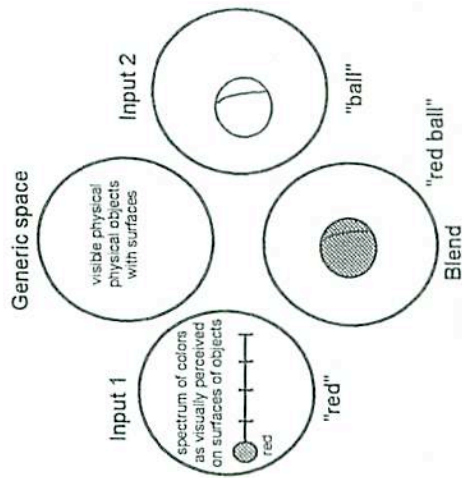


Figure 1. "red ball" interpreted as meaning a ball with a red surface

Yet the very fact that *red* may also refer metonymically to the identifying mark on the surface of the ball, or to the uniforms of the team who own and use the ball—or even metaphorically serve as a slur on the politics of the government of the country where the ball was manufactured—makes us already aware that the connection between the referent noun and the concept actually elaborated by *red* may go far beyond the amount of frame structure which is necessarily

unlikely addition to this range. In (2), therefore, there is no unique referent space for *then* to refer back to.

- (1) If she arrives in time, (then) we'll go out to dinner.
- (2) Even if he commits a crime, (#then) they'll vote for him.¹¹

Why did so many analysts think they could (and should) get by with a meaningless treatment of conditional *then*? The reason for this blindness was largely that the meaning of conditional *then* overlaps to a very significant extent with the meaning relations expressed by the *if P, Q* construction, when *that construction is being used predictively*. A predictive conditional such as *If she arrives on time, we'll go out to dinner* is used precisely to mean that the speaker predicts the possibility of going out based on the arrival time of the relevant participant. As Dancygier and Sweetser point out (1996, 1997), the interpretation of such a prediction as relevant is often based on the assumption that there is a two-way correlation between the two parameters P and Q—that P is being used as a predictor of Q because not only will Q occur if P, but Q is only likely to occur if P (the classic “conditional perfection” or “IFF implicature”). Under such circumstances, P is the unique space under consideration wherein Q will occur. This is true whether or not conditional *then* refers back to that unique space. And so, in such cases, conditional *then* adds little to the meaning constructed (in context) by a hearer from a simple *If P, Q*, although we might say that it formally and explicitly marks some aspects of meaning which the *If P, Q* form itself does not conventionally denote.

In general, meaning-composition is easy when there is appropriate overlap between the conceptual structures to be combined in a blend. However, either conventional lexical meaning or context may contribute that overlap. In a context where we know that there are teams of ball-players with uniforms of different colors, *red ball* can access the broader frame for *ball*, which includes the teams and their uniforms; and *red* may then apply to the color of the ball-owning team's uniforms, making use of the same mapping and blending principles which allowed us to interpret *red* as describing the external surface of the ball itself.

conventionally evoked by the word *ball*'s value as a linguistic sign. Linguists have, however, treated the most direct cases (*red surface of the ball*, for instance,) as the central examples, and the others as the deviations or extensions—a fact to which we shall return.

We have already said that overlap or redundancy is often preferred, rather than outlawed, in linguistic structure. But much traditional semantic analysis has been based on the opposite assumption. With some salient exceptions (Langacker's [1991] treatment of the English passive stands out as a good example here), it has been common for semanticists to say that, if a constituent morpheme of a construction apparently adds no meaning beyond that expressed by the other morphemes in the construction (contributes no added meaning as its unique contribution), it is “meaningless.”

A case study in point is the treatment of *then* in English conditional constructions. Analysts have treated *then* as a meaningless formal marker of conditional consequent status, a status already sufficiently marked by the presence of *if* on the protasis, and often by clause order as well. Dancygier and Sweetser (1997) argue instead that conditional *then* is closely semantically related to temporal *then*; both are deictic to mental spaces presumably accessible to the addressee, with the difference that temporal *then* refers to a temporal space, while conditional *then* refers to a conditional one.¹⁰ This account has the advantage of predicting some salient gaps in the use of conditional *then*, which are unmotivated by an analysis of *then* as a meaningless grammatical marker. Dancygier and Sweetser note that *then* is not possible in *even if* conditionals, for example, and that (given a deictic semantics for *then*) this fact would be predicted on the grounds that *even if* conditionals do not define a unique mental space within which the consequent holds. Indeed, their whole point is that the consequent holds in a range of mental spaces, including the one described in the consequent clause.

For example, although (1) can readily be interpreted as meaning that we'll go out to dinner only in the space wherein she arrives in time, (2) presupposes a range of spaces or situations wherein people might vote for a candidate, and includes the consequent space as an

4. More obviously extended cases: safe distances, usual suspects, and intellectual sleeping pills.

Let us examine some of the more problematic cases of A-N modification for a simpleminded theory of semantic compositionality based on traditional logical semantic categorization and combination. In the case of *safe distance*, we might initially say (as objectivist semanticists) that a distance itself cannot be safe. But *safe* involves a frame of risk or danger, i.e. a possibility of harm happening to some endangered entity (here I draw on the analysis of RISK in Fillmore and Atkins 1992). The frame includes some potential cause of harm which is the source of the danger, and the knowledge that keeping endangered entities physically separate from possible sources of physical harm may prevent harm from happening, thus keeping the entities "safe." The question is how this frame is to be mapped to the frame of the noun modified by *safe*. A use like *safe baby* might encourage us to identify the baby with the endangered object (as in Figure 2), since we consider babies to be harmless, vulnerable, and deserving of cherishing and protection from harm.

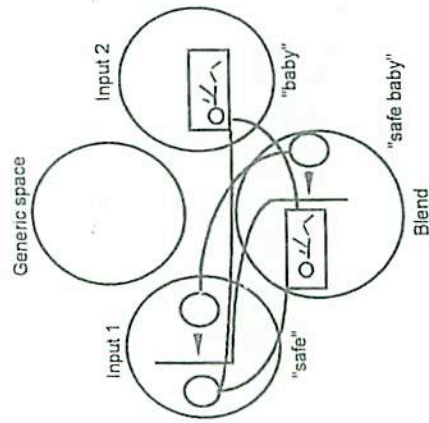


Figure 2. "safe baby" interpreted as meaning that the baby is the potentially endangered object

On the other hand, *safe dog (for the baby to play with)* or *safe beach (for the baby to play on)* might encourage us to identify the dog or the beach with the possible source of danger (as in Figure 3). All of this is of course contextually shaped: A *safe dog* could also mean a dog which is unlikely to be caught by a bear.

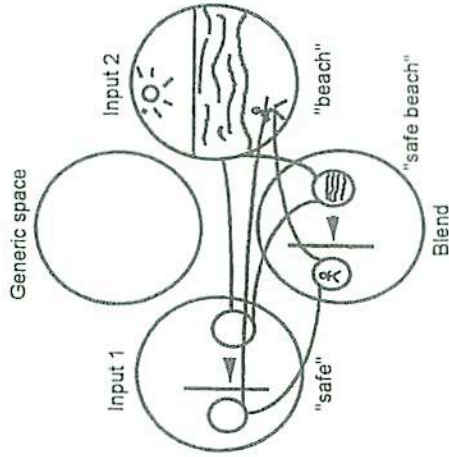


Figure 3. "safe beach" interpreted as meaning that the physical beach is the potential source of danger, and a human visitor is the potentially endangered object

By this analysis, a *safe house* might be a house which is not itself endangered (by an earthquake, for example), a house which is not a source of danger (to children playing in it), or a house wherein potentially endangered people are not accessible to some other source of danger (e.g., discovery by the police). Figure 4 portrays these different possible mappings between the input space defined by *safe* and that defined by *house*. A *safe distance*, on the other hand, seems most readily to mean a distance between endangered object and source of harm, which is sufficient to keep the source from harming the endangered object. Unlike *house*, which can readily fill many different slots in the frame of *safe* (since a house is commonly conceptualized variously as a valued object, a potentially dangerous environment, and a

protective location), *distance* is conceptually much easier to fit into one particular slot in the *safe* frame than into others.

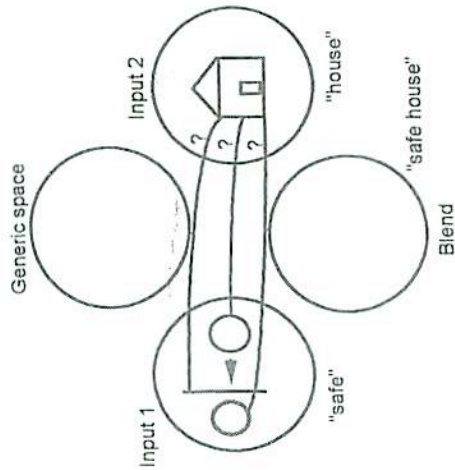


Figure 4. Some possible ways of interpreting "safe house"

Sometimes only metaphorical structuring will allow us to access a reading for an A-N phrase. *Intellectual sleeping pills*, as a label for sermons, is an example of this. Ignoring the composition of *sleeping pills* (itself an interesting phrasal compound), we might say that *intellectual* is typical of a class of adjectives which we might call domain adjectives (after Ernst's [1984] treatment of "domain adverbs"). It specifies a range of mental spaces, structured by frames involving intellectual activity, as opposed to physical entities and activities, or even religious or political entities and activities. The hearer's job, in finding a reading for the phrase, will therefore be to blend the space involving sleeping pills with some space involving the intellect rather than the body. Metaphoric blending achieves this: The pills, which map onto the sermons, cause physical inactivity or unconsciousness, which maps onto mental inactivity or unawareness caused by the sermons. The humor of this phrase derives from the fact that sleeping pills are intended to cause sleep, and people normally take a sleeping

pill only when they need sleep and welcome the sleep which they intend it to cause; while sermons, although intended by the preacher to intellectually benefit the listeners, are not actually causing a welcome effect (or fulfilling anyone's intention) by boring the listeners to a state of mental stupor as in this scenario.

It is important to notice that within a semantics structured by mental spaces, and within a treatment of metaphor as involving a specialized variety of space blending,¹² we get metaphorical reference "for free". That is to say, we need construct no special mechanism whereby the phrase *sleeping pills* is allowed to profile not actual sleeping pills, but their "counterpart" in the intellectual domain (see Figure 5).

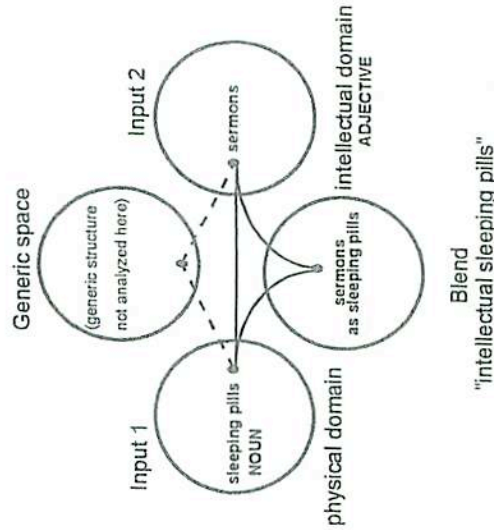


Figure 5.

As Fauconnier (1985) noticed, there is pervasive use of nominal forms to refer not to their direct referent but to the counterpart of that referent in another mental space. For example, an author's name can refer to a work by that author; a real person's name can refer to a picture of that person; an actor's name can refer to the character

5. Generalizations about Adjective-Noun interpretation in English

What are the general rules about how to put together A-N meanings in English? Following Langacker's (1987, 1991a,b) treatment of modification as elaboration of active zones, we can say that the noun referentially *profiles* some entity as a member of the appropriate (non-classical) category, while the adjective *elaborates* some *active zone* of the entity profiled by the noun. In the red-surface reading of *red ball*, the noun *ball* profiles the concept of a ball, and the adjective *red* elaborates the color of the surface of the ball.

But "active zone" in my expanded sense may include things not mentioned in most previous work: not only parts or aspects of the entity itself, but parts or aspects of the frames associated with it in the complex context of the particular utterance, and even counterparts of the entity in another mental space (whether via metaphorical mappings, or by other inter-domain counterpart relationships such as depiction, belief, time, and so on). The reading of *red ball* as the ball used by the team with the red uniforms takes the team's uniforms (linked to the ball by a cognitive frame of competitive ball-playing) as an accessible active zone of the ball. An *intellectual sleeping pill* is the *counterpart* of a sleeping pill (the Noun's referent in the source-domain mental space of physical bodily causal forces and reactions) in the target-domain mental space of intellectual and psychological causal forces and reactions. Here, the adjective *intellectual* elaborates the relevant active zone by specifying in what mental space the ultimate referent of the phrase is located: the "active zone" of *sleeping pill* becomes the metaphorical cross-domain counterpart of the direct referent.

It should be clear how some other basic problems are to be solved. A *fake gun* is not a gun in the base space, but its counterpart in the mental space of some deceived person (evoked by the frame of *fake*, as Coulson and Fauconnier [in press] argue) is correctly described as a gun. The speaker's base space (not portrayed in Figure 6 below) is like that of the trickster, not like that of the dupe, since the use of the word *fake* involves the speaker's necessarily knowledge-

performed by that actor, and vice versa. Metaphorical reference is a unidirectional counterpart mapping relationship between spaces, which permits the use of source-space descriptions to refer to their counterparts in the target space, but not vice versa. Hence *sleeping pill* can refer to a sermon (as construed via this unidirectional blending process), but *sermon* would be unlikely to refer to a sleeping pill, via this set of metaphorical mappings. This means that, with the right contextual help from space-blending, an accessible conceptual active zone of *sleeping pill* is sermons, an entity indeed appropriately elaborated by *intellectual*.

Now, a metaphor analyst who believes that metaphorical readings are obtained by rejection of literal ones¹³ might say we have just discussed such an example: *intellectual* clashes with *sleeping pills*, a coherent literal meaning is hard to find, and the hearer eventually has recourse to the metaphorical one. But notice that cross-space links are part of referent-location in any case (cf. Fauconnier 1985, 1997; Turner 1991,¹⁴ Fauconnier and Sweetser 1996). A hearer of phrases like *a gentler, kinder Maggie Thatcher, the painted* (as opposed to *flesh-and-blood*) *Sandy*, or for that matter *my Berkeley roommate*, has to figure out that the speaker is not referring to Sandy but to Sandy's portrait; recognize that the relevant domain of search for the roommate is the speaker's Berkeley student life (which may not be the current situation); and either decide that Maggie Thatcher at a later date is being referred to as an entity contrasting with Maggie Thatcher at an earlier date, or decide alternatively that some other person is being referred to as a counterpart of Maggie Thatcher in another domain (cf. *Our new mayor is sort of a gentler, kinder Maggie Thatcher*). Are all of these accomplished via rejection of an original basic reading? If so, then not only metaphor but much of English modification is so accomplished. But there is nothing in what we know about the processing of adjectival modification at large to suggest to us that it generally requires garden-path styles of interpretation.

able assessment of contrast between a knowledgeable trickster and an unaware dupe. Temporal modifiers such as *former* operate in a similar manner, so that a *former president* or an *ex-husband* does not fill the slot of a president or a husband in the relevant frame in the base mental space, but is the counterpart of an entity in a past mental space who fills such a slot in that space. *Former* depends on the speaker's present assessment of a contrast between the past and present mental spaces. *Fake* and *former* thus elaborate the referents of *gun* and *president* by (1) specifying a configuration of spaces, including a contrast between a space where the relevant description or property does hold and one where it does not hold, and (2) profiling the "deviant" space (the one which contrasts with the knowledgeable base space) which is therefore taken as the space within which the description *gun* or the role-value mapping *president* is taken as holding (see Figure 6).

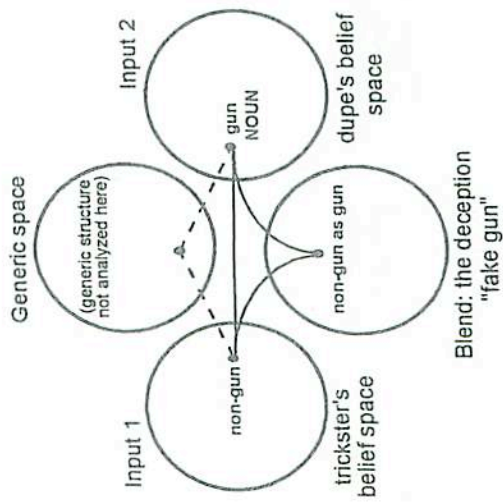


Figure 6. The ADJECTIVE, "fake", refers to the entire mental space structure, including the contrast between Inputs 1 and 2. It profiles Input 2.

The interaction of frame-structured spaces with interspace mappings and active-zone phenomena thus automatically gives us the varied interpretations of A-N constructions involving an adjective such as *safe* or *intellectual* or *fake*. This is under the assumption that connected mental space configurations themselves constitute complex wholes subject to Langacker's active-zone principle.

Crucially, just as metaphoric readings do not seem to need previous processing of and rejection of a literal sense (cf. Gibbs 1994), likewise most of these A-N examples do not seem intuitively to involve "garden-path" interpretation structures. What they do involve is a lot of flexibility, but not mostly in revising or rejecting structural connections in these cases—rather, in fitting appropriate aspects of each word's meaning to appropriate aspects of the cognitive structure at hand (cf. Turner 1991, Coulson 1997). This is what humans are apparently virtuosos in accomplishing: the finding of cognitive "affordances" to connect aspects of cognitive structure to each other, especially when we are given material which is assumed to represent some coherent structure accessed by the speaker. Part of what makes that affordance-finding and affordance-developing easy is that cross-domain reference-location is not a difficult task but a normal one: We constantly access multiple spaces, and context and the ongoing dynamic process of meaning-building will determine whether the "simplest" reading of some word is the literal (or "direct") reading or one demanding interspace connections.

We know that speakers' access to readings is not determined simply by a decontextualized metric of directness of form-meaning fit, but also by contextual evocation of one reading or another as relevant. "Indirect" interpretations, involving Gricean reasoning for example, seem often to be more accessible in context than the so-called "direct" interpretation would be. In Coleman and Kay's (1981) questionnaire research about the use of the verb *lie*, they gave each respondent a list of brief stories to read, and then asked whether the protagonist of each story had lied. One story involved John and Mary, who had recently begun dating; John asks Mary whether she has seen her old boyfriend, Valentino, lately, and she responds that Valentino's been sick with mononucleosis for the last month. The narrator informs

their central space-structuring frames. In the case of *likely* or *possible*, we might want to say that the primary referential range is that of epistemic evaluation of a theory or hypothesis about a present or future event (how *likely* does the evaluator feel it is that the hypothetical or described mental space matches reality, or will match future reality.) *His arrival is likely but not certain* means that the evaluator is not certain that the hypothetical event of arrival will match reality, but thinks there is a good chance it will. A *likely story*, by metonymy, is one which expresses a theory that is plausible to someone. Since the frame for *story* inherently involves an expressed content, which is something in the teller and hearer's epistemic spaces, it is fairly easy to see how to blend this frame with that of *likely*; we assume that what is linked to *likely*'s "plausible theory" slot is the *content* slot from the story frame. What about *candidate* or *textbook*? The frames for these words do not seem to automatically evoke a slot involving a hypothesis about some state of affairs.

The answer seems to be that the speaker's and hearer's epistemic spaces are generally accessible parts of the frame of speech interaction. *Likely candidate* therefore asks the hearer to build a mental space wherein there is some hypothesis which the speaker could evaluate as likely, and wherein the candidate can also find a slot. Among the obvious hypotheses are ones about the sequential structure of the frame for candidacy: It may be likely that someone will become a candidate, or that someone (once a candidate) will succeed as a candidate by winning the election for which candidacy was declared. These frame structures of candidacy initiation and of success in the goal of candidacy are automatically evoked by the use of the category *candidate*. And indeed, *likely candidate* can mean someone likely to be or become a candidate or to succeed as a candidate. In Figure 7, I give a partial blended-spaces analysis of the reading of *likely candidate* which takes it to mean that the person is likely to be a candidate. The scenario which is being evaluated (within the speaker's mental space) as to its likelihood of matching reality is a scenario wherein a particular individual is the filler for the role of candidate in the conceptual frame of an election.

us that Valentino has indeed been sick, but that Mary also had a date with him the night before. Some respondents went so far as to say not only that Mary had lied, but that "Mary said no, she hadn't seen Valentino." It seems harder for speakers to remove the conversational inferences from their interpretation of this utterance than it is for them to perform the inferences.

Similarly, Gibbs (1994) shows that metaphorical interpretations need not be accessed more slowly than literal ones, in contexts where the metaphorical reading is the relevant one. Sperber and Wilson's (1986) general claim that the most relevant reading is always the one most readily accessed needs more precision to become non-circular and testable, but it seems relatively clear how to compare pairs of readings such as those dealt with by Gibbs. Priming effects are of course the most general evidence for contextually differential access of meaning, and Coulson (1997) provides an insightful examination of some aspects of on-line mental space construction, leading the way in applying psycholinguistic methodology to the analysis of mental space constructs.

So the flexible affordance-finding cognitive strategies which characterize A-N interpretation are only the same strategies used in all our space-building and meaning-construction. And the work of such affordance-finding is often not much work for the processor, although it may present significant difficulties for the analyst trying to "unpack" the results.

6. Inter-level blends: what's so likely about a candidate, or so possible about a textbook?

An example such as *likely candidate* or *possible textbook* is in one sense a simple case: We do not have much tendency for the two components to contradict each other, so we won't have much problem with altering the central range of readings of either. But it's also less obvious than with *red ball* what to think of as a prototypical range of readings. *Red* centrally refers to physical color, and *ball* to a class of physical objects, so there is automatically some overlap in

provide the scenario, relative to some particular candidate (as in the "home on Friday night" reading—which could just as well apply to *likely colleague*, for example).

Possible *textbook* functions similarly. Assuming again that speakers evaluate primarily event-scenarios as possible or impossible, the hearer is here invited to find a scenario relevant to the textbook which can be evaluated in this way. For a faculty member, scenarios of textbook choice and textbook use in a class may be readily accessible; readings of "a textbook which one could adopt" or "a textbook which one could (effectively) use for teaching" are therefore unsurprisingly accessible readings of the phrase. But of course, given the right contextually evoked scenario, the phrase might get understood as meaning "the textbook which one could use to prop up the overhead projector to the right angle."

Adjectives like *possible* and *likely*, along with epistemic modal verbs and other such markers, refer to frames of epistemic structure and epistemic behavior (reasoning, plausibility-evaluation, comparison of mental spaces with a "reality"-space, and so on). They therefore generally demand a different kind of space-blending than that which is involved in *red ball*.

The important point here is that in order to account for these nominal modification constructions, we need all the apparatus required to deal with sentence-level phenomena such as modals and domain adverbs. Because the semantics of *likely* evokes a frame of epistemic evaluation, when it is used without explicit reference to such a frame in the content of the utterance, it is interpreted by reference to the implicit presence of the speaker's epistemic processes. This is just what is necessary for other examples such as sentential *probably*, in the epistemic domain, or for speech-act modifiers like *frankly*.

- (3) *Frankly and honestly*, Rhett told Scarlett what he thought of her. (Content-level interpretation: *frankly and honestly* modifies the described activity of telling, and frankness and honesty are attributed to its agent, Rhett.)

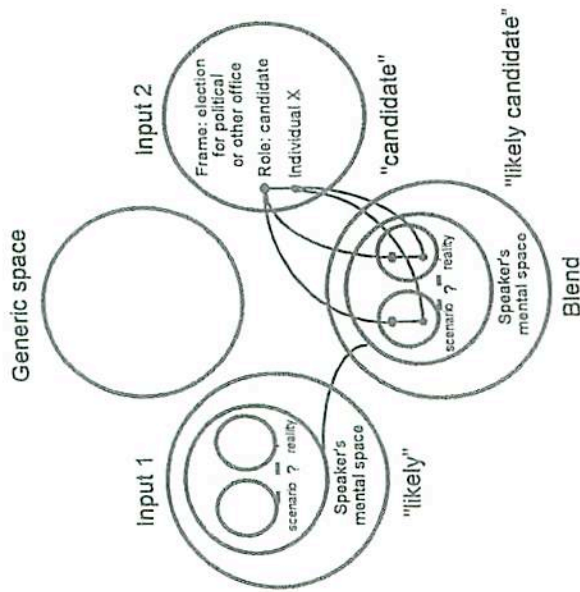


Figure 7. "likely candidate" interpreted as meaning a person likely to become or be a candidate

But *likely candidate* can also mean plenty of other things: the candidate whom a reporter sees as more likely to grant an interview than other candidates, the candidate who would be likely to cave in under the pressure of negative advertising which the speaker is planning, the candidate who is likely to care about some particular issue, the candidate who would be likely to be home on Friday night to answer an urgent query, and so on. So long as we can think up a scenario relative to the candidate in question, and evaluate that scenario for likelihood, *likely candidate* can mean the candidate who figures in the scenario we have labelled as likely. Only context will tell us what scenario that is; and it may or may not be a scenario which is itself part of the conventional frame of candidacy. Either the word *candidate* itself may evoke the scenario (as in the readings where it is declaration of candidacy or election which are likely), or context may

global parsimony to the exclusion of these factors from linguistic semantics, if they are real aspects of the cognition underlying language. Our theory can certainly still follow Occam's razor, in the sense that we should not posit unmotivated structure for its own sake, but rather do so as needed to account for data.

None of these claims are completely new; I have cited a broad spectrum of semantics work within and outside of the cognitive linguistics community, which has all tended in the same direction. What I have tried to do in this paper is to show how fully the need for a richer semantics is manifested in a single, very "simple" English construction which formal semantics continues to treat as essentially combinatorial despite extensive scholarly examination of the problems with such a treatment. A cognitive semantics allows us to give a treatment of Adjective-Noun modification which is genuinely unified, and genuinely compositional, and at the same time is flexible enough to account for the actual data. Without invoking mechanisms such as metaphor or frames, we would either have to give up on the claim that there is any general principle about combining the semantics of adjectives and nouns in a modification construction, or give up on compositionality itself. If formal semantics can claim to be the heir of the generative tradition in placing a high value on minimal theoretical apparatus, it cannot (on actual inspection of the data) simultaneously claim to maintain a principle of regular semantic compositionality. While there are plenty of non-compositional, or incompletely compositional, aspects to linguistic semantics—no linguist would want to treat all idioms as fully compositional—nonetheless compositionality is a basic and pervasive aspect of linguistic semantics, and cannot be adequately described without adequate description of the categories to be combined. These issues have been obscured to some extent, for many linguists, by the traditional quality of linguistic examples. But as Langacker has long been telling us, it suffices to examine *purple potato* (is it the interior flesh or the exterior skin which is purple?) instead of *red apple*, to see how much linguists' interpretation of the former has depended on already-conventional construction of active zones and pre-definition of the overlap between the meanings of the noun and the adjective. Here I have tried to show that by taking our

- (4) *Frankly and honestly*, my dear, I do not give a damn.
(Speech-act level interpretation: *Frankly and honestly* modifies the current speech act, and frankness and honesty are attributed to the speaker.)

The semantics of *frankly* evokes a frame of speech interaction and speaker sincerity. When used without explicit content reference to such a frame, it can be interpreted by reference to the implicit presence of the present speech interaction: word order and intonation must allow "sentential" level of modification, for this option to be available. Although it does not seem as though *frank* and *honest* as modifying adjectives can be given this kind of implicitly speaker-based interpretation, adnominal modifier uses such as *bona fide* (as in *a bona fide antique*) or *honest-to-God* (as in *an honest-to-God best-seller*) are certainly interpretable as referring to the speaker's honesty in this way.¹⁶

7. What kind of theory do we need?

A genuinely plausible theory of semantic compositionality cannot be based on a few cases which logicians find convenient, with the assumption that it can be extended some day to handle the rest of the data. It has to deal with the immense combinatorial complexity of everyday constructions in real languages, as used by speakers engaged in the linguistic construction of mental space structure within a rich context. And to any linguist it is clear that the linguistic constructions discussed in this paper represent a microscopic fraction of the possibilities out there in the world. This doesn't mean our theory has to be uneconomical. It will surely be a richer and more complex theory of semantic categorization and combination than many formal semantic ones, but this added complexity will involve cognitive structures and processes which are necessarily part of any plausible theory of cognition in general: fuzzy and prototype-structured categorization, salient instances, metaphorical and metonymic links, frames, active zones, roles and values, mental spaces and so on. There is of course no

responsibilities for *red apples* and *purple potatoes* seriously, linguists get almost for free a reasonable account of supposedly deviant or problematic cases such as *safe distances*, *likely candidates*, and *fake guns*. I argue that mechanisms such as the implicit evocation of the speaker's epistemic or speech-act space are not required only to account for conjunctions and discourse markers (cf. Sweetser 1990, Dancygier and Sweetser 1996), but also within the compositional semantics of the Adjective-Noun construction; this is added evidence of their basic status in linguistic cognition.

Speakers are engaged in prompting shared mental space construction by linguistic use. Linguistic compositionality must be described in a way flexible enough to reflect the facts that forms may be adding structure to any one of many accessible mental spaces; crucially, besides multiple content spaces (the picture, "reality", various conditional and temporal and locational spaces, and so on—cf. Fauconnier 1985, 1997), forms may be adding structure to the epistemic space, the speech-act space, the metalinguistic or metatextual space. Speakers know what aspects of form are flexible in this way: English appears, for example, to be unusually flexible in its use of the basic conditional construction. Crucially, composition is not just a matter of putting together pieces of the "same kind" of content into a single homogeneous structure. Compositionality looks more homogeneous, or at least more unified, if we recognize the range and diversity of the units to be combined.

As a final observation, I would like to add that it seems to me almost impossible to construct an adequate theory of meaning which is simultaneously objectivist and regularly compositional. Less flexible meaning units will simply not produce the range of actual compositional meanings, by regular composition. Since all the contrasts in compositionally constructed meaning discussed in this paper are relevant to truth conditions,¹⁷ and yet cannot be accounted for without recourse to a wide range of non-objectivist semantic and conceptual constructs, we presumably need to accept accounts of "truth", as well as of semantic compositionality, which take conceptual structure into account.

Notes

1. Cf. Rosch (1977), Mervis and Rosch (1981), Kay and McDaniell (1978), Coleman and Kay (1981), Sweetser (1987), Fillmore (1982, 1985).
2. Cf. Downing's (1977) treatment of N-N compounds. Ryder (1994) suggests a variety of inter-related templates for N-N compounds, with frame-structuring as part of the semantics to be composed; this approach is clearly in many ways consistent with Fauconnier and Turner's (1995, 1996, 1998) recent blended-spaces approach to N-N compounds.
3. Sweetser (1990) postulates the potential accessibility of the speech-interactive context and of the speaker's mental processes, as a general background to interpretation of utterances; I also argue specifically for the need to attach such interpretive possibilities by convention to the semantics of particular forms (e.g. the English modal *may* has a speech-act reading, but most other English modals do not).
4. See the papers in Fauconnier and Sweetser (1996), in particular Sanders and Redeker (1996).
5. For the basic literature on Mental Spaces theory, see Fauconnier (1985, 1997); a number of papers developing different aspects of the theory can be found in Fauconnier and Sweetser (1996), which contains an introductory chapter laying out central aspects of Mental Spaces theory.
6. A related frame-based approach to modifying relative clauses in Japanese can be found in Matsumoto (1997).
7. Cf. Searle's (1979) discussion of the different interpretations of the verb *open*, in *open the door*, *open the book*, *open your eyes*, and so forth. Once again, one cannot know which interpretation to give to the verb until one negotiates between the meaning of *open* and that of the object NP. An insightful treatment of this issue can be found in van der Leek (1996).
8. See the particularly useful discussion of this in Fauconnier's preface to the 1994 Cambridge University Press reprint of Fauconnier (1985).
9. See Kay and McDaniell (1978).
10. Schiffrin (1992), in a study of the uses of *then* in a spoken corpus, comments that almost all of the conditional *then* uses in her corpus also had some clear temporal referent frame attached to the condition.
11. The editors have commented to me that examples like (2) seem more acceptable with an *even* in each clause: (3) *Even if he commits a crime, even then they'll vote for him*. Note that in (3), *then* must be stressed and contrastive, forcing a unique-referent reading for the space in which the voting occurs. The unstressed and non-contrastive *then* in (2) seems to need to presuppose a unique referent space to refer back to; it cannot impose its unique-referent reading on the scalar reading of *even*.

12. Specifically, a one-sided network (cf. Fauconnier and Turner 1998), with the asymmetry between source and target domains which characterizes metaphorical structure (cf. Lakoff and Johnson 1980, Lakoff 1993).
13. *E.g.*, Searle (1979).
14. Note particularly Turner's pp. 209 ff.
15. Cf. Sweetser 1990, Dancygier and Sweetser 1996, for discussion of the distinction between content, epistemic, speech-act, and metalinguistic readings.
16. It should be noted that gesture is of special interest in understanding how the speaker's own cognitive and interactional spaces are blended with the content space (Kendon 1995 and Sweetser 1997 address some gestural uses which seem to call for this kind of analysis). The same is of course true of signed languages; Liddell (1998) treats ASL as creating blended spaces grounded in the speaker's physical space).
17. See Kittay's (1987) argument about the status.

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Idealist and empiricist tendencies in cognitive semantics

Dirk Geeraerts

Prologue

The methodological situation in present-day Cognitive Linguistics is characterized by the existence of two methodological extremes. On the one hand, there is the idealistic approach most conspicuously advocated by Anna Wierzbicka in her numerous publications (among which 1985, 1992, 1996). On the other hand, there exist various tendencies to objectivize the methods used in Cognitive Linguistics. Roughly, there are three main tendencies at this end of the methodological opposition: psycholinguistic research (as in Sandra and Rice 1995 or Gibbs 1994), neurophysiological modeling (as in Regier 1995), and quantitative corpus-based analysis (as in Geeraerts, Grondelaers and Bakema 1994). Most actual work in Cognitive Linguistics is probably situated somewhere in-between both extremes, or rather, the practical methodology used is more often introspective rather than data-driven, but without the outspoken idealistic commitments that Anna Wierzbicka explicitly describes. Whence the title of the following dialogue (taken from Machado de Assis' *Quincas Borba*): even those cognitive linguists who have never reflected on the epistemological underpinnings of their practical work, are implicitly caught up in the debate between the idealistic and the more empiristically minded approaches. My own position in the debate is clearly not on the idealist side, but the following dialogue (which suitably takes a platonic form) tries to establish why that choice is less self-evident than it may appear once one has made it.

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Editors

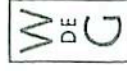
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