IN HONOR OF WILLIAM S-Y. WANG:

INTERDISCIPLINARY STUDIES ON LANGUAGE AND LANGUAGE CHANGE

The Hard Road from Verbs to Nouns

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1. The straw man

From much of the work in recent decades on the grammar and semantics of verbs,[1] it is easy to form the impression that the main functional difference between verbs and nouns is something like this: that the semantic structure of a verb provides information about the actions and relations that make up the central part of the interpretation of the sentences they occur in, while the role of the nouns in a sentence is merely that of characterizing the entities that participate in those actions or relations. Put differently, verbs[2] are the words that predicate, and the nouns (more accurately, the phrases that are headed by nouns) give us the arguments in such predications.

If, when we consider the accuracy of this view, the nouns we first think of are *cat*, *dog*, *man*, *woman*, *ball* and *stick*, and the verbs we first think of are *sleep*, *die*, *chase*, *love*, *hit*, *eat*, and *catch*, we will find it easy to stay with this conception. We can stay with it even after we have added the kinds of verbs that take other verb-based expressions among their complements, such as *want*, *think*, *persuade*, *use* and *cause*. Thus, with the usual kind of multi-layered sentences that linguists enjoy inventing, such as

> The cat thinks the man wants to persuade the woman to use the stick to cause the ball to hit the dog.

we have no trouble holding to the belief that the job of nouns is limited to that of giving us the cast of characters and the list of props. In fact, it has sometimes seemed useful, in discussions of compositional semantics, to avoid the distractions of noun meanings, by replacing nominal constituents with letters of the alphabet, limiting ourselves to structures made up of verbs, adjectives, quantifiers and the necessary function words, using capital-letter variables as place-holders for the noun-headed constituents. Thus, almost everything that we might want to say about the semantics of a structure like

> A wanted to ask B if C had been able to fit every D into E without using the F that C received from G.

is more or less independent of the nature of the items identified here as A through G.

Everybody will instantly see that the view I have characterized is a distortion. Nouns include more than the names of (sets of) "things". There are nouns that name complex social and political institutions, there are nouns that name abstract concepts, there are nouns that enter into tight collocational links with verbs and have no separate semantic description, and there are nouns derived from verbs which incorporate the same argument structures as their source verb.

My objective in this paper is to point out differences in the relative complexity of nouns and verbs in precisely the cases where paired noun and verb share a central semantic structure. Nouns that are semantically related to verbs (the clearest case being deverbal nominalizations) are inherently capable of greater complexity than their verbal partners, because of some important differences in the grammatical functions of the two classes of words.

2. Success with verbs

A few remarks first about the history of my involvement with this problem. In recent years I've been working with Beryl T. Atkins, lexicographical adviser to Oxford University Press, on a procedure for inquiring into lexical meaning that is a blending of the way she does lexicography and the way I do lexical semantics. This collaboration began with two joint papers attacking the English word RISK.[3] I say the word RISK because our initial aim was to prepare (within the framework we were developing) a complete sample lexical entry for RISK as a headword, and this would require us to look simultaneously at the verb and the noun. The work went on swimmingly well in the case of the verb; it overwhelmed us in the case of the noun.

The method of inquiry we were trying to define involves examining a very large number of attested examples of the word (or closely related family of words) under investigation, sorting the examples by sense (where the word is polysemous), characterizing each sense as carefully as we know how, and classifying those portions of each sentence surrounding the word which support or fill in the details of what we take to be the correct interpretation. The result of this initial processing would be a database upon which we could formulate an accurate description of the grammar and semantics of each word we subjected to this method.[4]

Our first step was to be that of characterizing, for each sense, the relevant *semantic frame*, or conceptual structure, which we believed to be presupposed by any user or interpreter of the word, labeling the elements of such frames, and showing how these *frame elements* could get realized in the grammatical surroundings of the word. At first the arm-chair linguist member of the team believed that our job would merely be one of determining the frame elements on the basis of our intuitive knowledge of the language,

and then recording for the sentences in our corpus how these elements got lexically or grammatically expressed (or understood but left unexpressed). The empirical part of the work was to be merely that of discovering, in the corpus, how the set of previously intuited semantic notions were linked to grammatical structures. From the experience with RISK, however, we learned that many of the essential semantic distinctions needed for constructing the underlying frames themselves did not become apparent until we had seen a great many corpus examples and had passed through many cycles of testing and revising our analyses.

After finally settling on a satisfactory frame description and tagging the sentences from a corpus that we felt was representative of what the language offered us for a given word, we then sought to generalize over these observations, such generalizations taking the form of (1) describing each use of the word in terms of (a) the semantic frame which it accessed and (b) the manner in which it presented some component, aspect or instance of such a frame, and (2) describing the morphosyntactic devices provided by the language for identifying some or all of the elements of that frame within or around the constructions containing the word.

There are cases in which this sort of work could go smoothly. Suppose we had done this with one of the really well-behaved verbs in the language, FEED.[5] We can characterize the frame as involving somebody getting some creature to eat, and within that frame we can identify the frame elements as the *feeder*, the *food*, and the *fed*. Generalizations I feel sure we could come up with, supported by corpus examples, would include these: that if the sentence is in the active voice, a natural array of syntactic elements around it provides it with a subject that identifies the feeder, a direct object that identifies the food, and a prepositional object, with TO, that identifies the fed. Passive voice and "dative" syntax give alternative valence possibilities, and there is also the version in which the fed creature is the direct object and the food is introduced with the preposition WITH. For the attestations of FEED which did not lend themselves straightforwardly to such a description, we could recognize a reduced frame in which no distinction is made between feeder and fed,

> Vampires feed on human blood.

or an expanded frame in which a frame element of *means* is added, for such sentences as

> One package will feed a family of four for three days.

as well as any of the various secondary or transferred senses which can be shown to have partly similar frame descriptions, needed for describing such sentences as

We have been feeding false information to the enemy.

The labels just used for naming the frame elements in the case of the suggested treatment of FEED were mere mnemonics, ad hoc and frame-specific, not chosen from a pre-set list of semantic role names. In a finished theory of semantics, of course, we will need to show how certain frames inherit, contain or overlap with other frames, and we will therefore want the frame element labels to be maximally "reusable", capable of revealing such relationships. In other words, we will want the theory to be built up of a well-motivated system of primitives and a specification of the precise means of building complex expressions out of such primitives, together with everything that is regular (within or across languages) about the links between semantic and morphosyntactic structurings. One component of the "feeding" frame will be what we might call the "eating" frame. Further the main structure of the feeding frame will incorporate a "giving" or "providing" frame. And so on. Ultimately the framework developed for such work will lend itself to a precise elaboration of the semantic and grammatical interrelatedness of the words in a single language, the formulation of principles of semantic universals and lexicalization typologies, and so on, in the comparison of lexicons across languages. The work that I am describing now, however, is empirical and inductive, representing the "discovery" phase of that larger effort.

Such a project, I believe, could make relatively easy progress in the case of a very large number of verbs, especially verbs whose central semantic structures involve location, change of location, caused change of location, ownership, change of ownership, caused change of ownership, posture or shape, change of posture or shape, caused change of posture or shape, or, of course, eating and feeding.

It is often the case with the "simple" verbs of the types just alluded to that the states of affairs presented in the clauses they head have a fairly straightforward relationship to the linguistic information the clause provides. When a situation is described as one in which giving, breaking, buying or feeding takes place, that is generally a situation within which there are people and objects that correspond to the individual frame elements and which have relationships or participate in interactions with each other of the sort that is tagged by the verbs that index these frames. We have a pretty good idea of exactly what is relevantly going on in a world in which some man is said to be feeding mouse parts to his cat.

The verb RISK falls outside of this class of easy cases. Briefly, it is a verb which gives no information about the actual states of affairs or actions referred to in its clause, but lets us know only that some objects or persons are said to be potentially in trouble. For example, if I tell you

We risked instant bankruptcy.

you have no idea what we did, but you know that with this sentence I express the fact that I have judged what we did to have certain possible negative consequences, and my phrase *instant bankruptcy* tells you something about that potential negative consequence. If I tell you

> You have just risked your reputation.

I have revealed nothing of what you did: I have said only that whatever it was that you did endangered something which is important to you, and I've identified that important thing as *your reputation*. Of course, if I tell you

> I'm going to risk crossing the channel in spite of the storm.

then I have indeed included in my message information about the behavior that I claim to be risky, namely *crossing the channel*. But that piece of substantive detail was not communicated by the verb RISK itself, but by the verb's gerundial complement.

Atkins and I went through hundreds of sentences with the verb RISK, taken from a corpus of contemporary American English.[6] I will illustrate our initial classification task with a set of examples taken from the corpus, simplified for reasons of space:

> he does not want to risk a rebuff
> he had risked his reputation
> he had to risk Pop getting mad at him
> he risked his life
> he risks committing grave mistakes
> I couldn't risk leaving my vantage point
> I risked a pause to let that sink in
> I wouldn't risk letting you meet her
> most of us decided to risk the venture
> now he was prepared to risk his good name
> she risked going into the pool alone
> they're both risking their personal political destruction
> they've never been willing to risk free elections
> you would risk death doing what she did

The first thing to notice is that there are just two grammatical shapes of the verb's complements, nominal and gerundial. On grammatical grounds, then, we can separate RISK clauses into two classes according to the grammatical form of the complement. That sorting is displayed as follows:

Those with gerundial complements

he had to risk Pop getting mad at him
he risks committing grave mistakes
I couldn't risk leaving my vantage point
I wouldn't risk letting you meet her
she risked going into the pool alone

Those with nominal complements

he does not want to risk a rebuff
he had risked his reputation
he risked his life
I risked a pause to let that sink in
most of us decided to risk the venture
now he was prepared to risk his good name
they're both risking their personal political destruction
they've never been willing to risk free elections
you would risk death doing what she did

We noted further that the sentences could be sorted semantically according to the interpretation of the complement. There are just three semantic roles that get communicated by such complements: (1) the unfortunate thing that can happen if things go wrong (we can call that "Bad" or BA), (2) some possession that might get lost or damaged if things go wrong (we can call it the "Possession" or PO), or (3) an act which can bring about the danger of things going wrong (we call this the "Deed" or DE). (The three sentences we began this discussion with are illustrations of these three semantic roles.)

The result of this new semantic sorting of our sample sentences, superimposed over the grammatical sorting given above, yields the following groupings.

Gerundial complements expressing . . .

BA

he had to risk Pop getting mad at him
he risks committing grave mistakes

DE[7]

I couldn't risk leaving my vantage point
I wouldn't risk letting you meet her
she risked going into the pool alone

Nominal complements expressing . . .

BA

he does not want to risk a rebuff
they're both risking their personal political destruction
you would risk death doing what she did

PO

he had risked his reputation
he risked his life
now he was prepared to risk his good name

DE[8]

I risked a pause to let that sink in
most of us decided to risk the venture
they've never been willing to risk free elections

Of the notions that make up a complete description of the family of semantic frames[9] for "risky" situations, those that figure in the syntax of RISK sentences include: the protagonist (PR), that is, the person who is threatened by the potential danger; the harm or bad thing that could befall the protagonist (BA); the valued possession (PO) of the protagonist which could get lost or harmed if things go wrong[10]; the deed (DE), the deed that someone can perform, or a state that one voluntarily undertakes to participate in,[11] that creates a situation in which something bad can happen; the goal (GO) that a protagonist might have in performing the deed.

The PO, a thing, is represented only by nominal complements; the DE, an act performed by the protagonist, can be expressed by a NP representing an act (directly or metonymically) or by a verbal gerund[12] which is controlled by the NP designating the protagonist and which directly represents the protagonist's risk-creating act; and the BA, which is something that happens to the protagonist, can be represented by a NP describing the unfortunate event, or by a verbal gerund with a controlled subject, representing something that the protagonist experiences or participates in (*committing grave mistakes*), or by a clausal gerund (*Pop getting mad at him*).

The grammatical subject (always PR) and object (DE, BA or PO) of the (active) verb will identify two of these frame elements, but other aspects of the RISK frame can be expressed elsewhere in the sentences, as prepositional or subordinate-clause adjuncts. In the sentence

By crossing during this storm you will be risking your life.

the PR and the PO are found as subject and object of the verb; but the DE is expressed in the BY-phrase. In the sentence

You have risked death for a few cheap thrills.

the PR and the BA are represented as subject and object, but the GO (the speaker's evaluation of what the PR tried to gain in engaging in risky behavior) is expressed in the FOR-phrase.

Because the three kinds of complements permit, quite roughly, three sorts of paraphrases, the verb can be thought of has having three senses[13]: those seen in (i) *risk death* ≅ 'incur the danger of death'; (ii) *risk your fortune* ≅ 'jeopardize your fortune'; and (iii) *risk crossing the channel* ≅ 'dare to cross the channel'.

But there is also a possible additional level of polysemy in this word, having to do with other conditions on the RISK frame, yielding various sub-frames within the RISK frame. In the first of these, there is no DE and no GO. The PR is merely a passive victim: we can refer to this as 'risk-passive'. Since (as I believe) the relationship between this 'passive' notion and the others is one of markedness, it is very difficult to construct a sentence which clearly conveys this notion. Since no convincing examples were found in the text, I resort to the following invented example:

Because of air pollution that we knew nothing about, we've been risking serious damage to our health these last few years just by living in this town.

In another set of cases, there is a DE but no GO. Here the protagonist actively does something, for no particular reason and without knowing that it could create a dangerous situation: we can refer to this as 'risk:active'. The example I invent for this is intended to be one for which we cannot easily imagine the actor making a choice for which he weighed the competing values of being in the street and losing his life.

By stepping into the street just then, you risked your life.

And in the third case, the protagonist makes a choice, having a purpose (the Goal), while knowing the possibility of things going wrong: I will call this 'risk:intentional'.[14]

It was stupid of me to risk my inheritance on lottery tickets.

Our processing of the sentences in our verb corpus yielded a combined informal syntactic and semantic parsing of the portions of the sentences surround RISK, of the sort suggested by the following diagrams. (Many details have been left out.)

I am going to risk crossing the channel in spite of the storm.

RISK	governed by AM GOING TO	risk:intentional (because of IN SPITE OF THE STORM)
CROSSING THE CHANNEL	gerund: complement of RISK	DE
I	subject of AM GOING TO; controlling subject of RISK	PR
IN SPITE OF THE STORM	adjunct: concessive	

By saying things like that you risk having your intentions misunderstood.

RISK	main verb	risk:active (because of BY SAYING THINGS LIKE THAT)
HAVING YOUR INTENTIONS MISUNDERSTOOD	gerund: complement of RISK	BA
YOU	subject of RISK	PR
BY SAYING THINGS LIKE THAT	adjunct: BY-marked gerund	DE

You'd risk your reputation for such foolishness?

RISK	main verb: modal WOULD	risk:intentional (because of FOR SUCH FOOLISHNESS)
YOUR REPUTATION	NP object of RISK	PO
YOU	subject of RISK	PR
FOR SUCH FOOLISHNESS	adjunct: FOR-marked purpose phrase	GO (evaluated by speaker)

After going through all of the verb examples, Atkins and I convinced ourselves that we know more or less everything that needs to be said about the meanings and uses of the verb in those sentences, and we came to believe that we are now in a position to provide the world with an account of the verb RISK which is correct and complete and clear. For those relatively few examples from our corpus that didn't fit neatly into our scheme, plausible accounts in terms of metonymy and metaphor, applying either to the frame elements that occurred with the verb, or to the verb itself, can be given that will bring them in line.

3. Failure with nouns

The verb RISK offered complexities enough, but when began work on the noun we encountered worlds of new difficulties. The reasons are these.

The proper way to describe a word[15] is to identify the grammatical constructions in which it participates and to characterize all of the obligatory and optional types of companions (complements, modifiers, adjuncts, etc.) which the word can have in such constructions, insofar as the occurrence of such accompanying elements is dependent in some way on the meaning of the word being described.[16] What that means is that, in an important sense, a linguistic description of a verb is a linguistic description of the clauses that the verb can occur in, and that is relatively simple. When describing a noun, however, there is much more to do.

Take our noun RISK.

(1) Since, like the verb, it has valence possibilities deriving from the RISK frame, it can have frame elements that are realizable as its complements (and/or as its specifier). For example:

the risk of losing your job	BA
the risk to your health	PO
the risk in driving while under the influence	DE
our major risk	PR

(2) Because of the kind of special semantics a noun can have, it is likely to refer to an action, experience, cause or product of some activity, and as such it is capable of being modified, determined, and quantified, and it is capable of participating in such semantic systems as whatever it is that distinguishes count and non-count nouns, etc. For example:

these considerable risks
(determined, modified, pluralized-hence-'count')
much needless risk
(modified, quantified-by-MUCH-hence-'non-count')

(3) Furthermore, as a noun it occurs as the head of a NP, and that NP can be a part of an adjunct prepositional phrase, or it can be a predicate, or it can be the argument of some clause which requires it to fit into some other frame. For example:

You can do this at no risk to your principal.
Jones is a serious security risk.
We must first calculate the risk.

(4) In its participation in any of these larger structures, it is available for idiomatization.[17]

We are at risk.
We are running a risk.

In short, there are many potential layers of relevance for the description of nouns: at the level of the noun's complements, at the level of the internal structure of the NP which contains it, and at the level of the larger structures within which that NP functions, syntactically and semantically. The point is, of course, that there can be lexically specific requirements and interpretations associated with a noun with reference to each of these levels. There are a few nouns, like CAT, whose description (I would guess) can begin and end at the level of the noun, since everything else about it follows from general principles; but all of the interesting nouns require a lot more.

Here are some of the phenomena we encountered in trying to sketch out the full story of the noun RISK.

The preposition phrase AT RISK functions as a predicate phrase. The fixed phrase AT RISK occurs (with copular support) as a complete sentential predicate, and hence can appear as a post-nominal modifier. The subject of AT RISK has the Protagonist role in the RISK frame (*We are at risk*). A frequently found collocation, with AT RISK used post-nominally, was the phrase *children at risk*, referring to children whose educational or nutritional future was uncertain. The schema that applies in this case, it would seem, is what we referred to as risk:passive. In a situation in which it was clear that the risk was created by some act of the protagonist, as when I decide to bet my life savings at the races, one could not appropriately remark that the protagonist was "at risk."[18]

More detailed inquiry might lead to some understanding of why we say AT RISK, with one preposition, but IN DANGER, IN JEOPARDY, IN PERIL, etc., with a different preposition, but we can be satisfied for the moment merely to say that the phrase AT RISK functions as a kind of predicate phrase and that it predicates of its subject the claim that the subject NP designates someone or something that exists in a state of affairs in which things might go wrong. Semantic reference to the frame is obviously necessary, but since this is an idiom, assigning a separate meaning to the noun would have no point.

The word occurs in several kinds of preposition phrases with adverbial function. RISK occurs in fixed prepositional colligations making up adverbials, where the clause to which it is adjoined expresses the DE in the RISK frame.

When the NP is definite and a gerundial complement accompanies it marked by the preposition OF, that complement identifies the BA, as in

You do so at the risk of losing your job.
. . . at the risk of losing me as your friend.

In phrases marked with the preposition TO, the element so introduced is the endangered PO, as in

I continue working here at considerable risk to my sanity.
You can invest in this fund at only slight risk to your principal.

And in adverbial phrases like *at your own risk*, what is identified in the possessive specifier is the PR.

You enter this cave at your own risk.

In these adverbial expressions RISK is only used in the singular, either undetermined or with a definite determiner. The context makes it impossible to know whether it is a count noun or a non-count noun.

RISK can be the head of a NP serving as a nominal predicate. When a NP headed by RISK is the predicate of a sentence, the subject is understood as a DE description that is judged likely to lead to unwelcome consequences, or as designating something that shows a tendency to cause things to go wrong.

Inviting him to your wedding would be a big risk.
You are a risk to everyone near you.

In the same function, it frequently occurs as the head of a Noun-Noun compound, the determining member identifying either the PO or the BA.

He is a security risk. (security = PO)
Your desk is a fire risk. (fire = BA)

In these contexts the word RISK is a count noun.

RISK can be the head of a NP introduced in an existential sentence. In existential sentences introducing RISK-headed NPs, we find the noun used in singular and plural, with grammatical supports compatible with either count or non-count noun usages, and I have no idea what to make of that.

There is some risk in this.
There are very great risks in this.
There is no risk.
There are no risks involved.

The count vs. non-count distinction is puzzling. It is difficult to imagine what separate messages could be communicated by these sentences:

There is some risk in doing this.	(non-count-noun use)
There are some risks in doing this.	(count-noun use)
There isn't much risk involved.	(non-count-noun use)
There aren't many risks involved.	(count-noun use)

RISK can head a NP serving as subject of copular predication. Sometimes the word RISK is the head of a NP which is the subject of a sentence of copular predication. Such sentences, based on our sample, are almost always sentences about magnitude.

The risk is only slight
The risks are considerable.
The risk is gone.

RISK can occur in tight collocation with RUN or TAKE . The noun RISK occurs with very high frequency as the object of RUN or TAKE, forming semi-idiomatic collocations with these verbs. The semantic difference between the two seems to be that in the case of TAKE-RISK, the meaning is that of 'risk:active' or 'risk:intentional', whereas in the case of RUN-RISK, it corresponds to 'risk:passive'. This distinction is supported by the intuition that in cases in which the Protagonist clearly does not do anything to create the risk, only RUN-RISK is possible.

The babies in this hospital run/*take the risk of hypothermia.[19]

Finally, RISK NPs can occur as arguments of 'ordinary' verbs or adjectives. In most of the remaining cases, RISK-headed NPs occur as the direct objects, or as subcategorized prepositional objects, of verbs or adjectives. The examples can, almost without residue, be sorted into four types, according to the meaning of the predicator. In one group of cases the verbs had meanings related to minimizing, eliminating, reducing, nullifying a risk; in another group the verbs had to do with accepting, bearing, enduring, facing a risk; in a third group the verbs had to do with a relationship between a situation or event and the risky situation that could emerge from it, the list including incur, involve, create, etc.; and in the fourth group the verbs had to do with the protagonist's consciously

taking into account the comparative value of acting toward a goal and facing the consequences of the goal not being achieved, as in expressions like calculate the risk, estimate the risk, know the risk, be aware of the risk, etc.

When we see the verbs that can take RISK-headed NPs as an argument, we realize that we are not dealing, in the case of RISK, merely with a participant in the frames associated with those verbs. What we know about the RISK frame is needed for understanding the significance of the verbal meanings themselves. Minimizing a risk is acting so that the BA is less likely to happen; calculating a risk is weighing the negative value of BA against the positive value of GO while estimating the relative probability of each. In such cases, the semantic structure associated with the noun in the direct object is absolutely essential to understanding the meaning of the verb phrase.

4. New project: visual perception

Since RISK the verb is itself quite complex, it was possible to believe, for a while, that the troubles with RISK the noun were quite special. The RISK work was followed by a period of participation in a European Community contrastive-lexicography project known as DELIS.[20] The project is dedicated to comparing five languages (English, Danish, Dutch, French, and Italian) in several vocabulary areas, in the hope of designing descriptive frameworks which will allow the cross-linguistic differences to be most perspicuously displayed and operated on. The first semantic domain chosen for this group was the language of sensation and perception. The verbs in this area include *see, look, hear, listen, sound, smell, taste, feel, perceive, notice, seem*, etc., and a large number of less central words in these domains, such as *glimpse, glance, stare, gawk, grope, sniff, sip*, etc.

For these verbs it seemed necessary to identify such macro-roles as Perceiver (PE) and Object of Perception (OP), and then to subdivide these in various ways. We need to be able to say something about how sentences with these verbs give expression to such notions as the PE-as-agent, the PE-as-experiencer; the OP-as-stimulus-source, the OP-as-stimulus-quality, the OP-as-discriminatum, and various other things. Examples of the realization of these notions in perception-verb sentences can be seen in the following annotated examples:

I looked at the photograph.
(PE as agent, OP as stimulus source)
I heard a loud bang.
(PE as experiencer, OP as stimulus quality)
I tasted coconut in the ice cream.
(PE as experiencer, OP as discriminatum)

But when we come to the nouns, we are lost again. The verb SEE, in its basic use as a simple verb of visual perception, has a fairly simple frame structure. Something representing the PE is typically the subject (of active uses), something representing the OP is the direct object, but of course it is also possible to add adjuncts referring to conditions of illumination (*in this light*), the organ (*out of his left eye*), an instrument (*with an electron microscope*), etc. But the noun SIGHT[21] created problems that can stand proudly alongside of those we found with the noun RISK.

Our sorting of the SIGHT examples[22] has not been completed, but we have at least scratched the surface of the tip of the iceberg. Each section in the discussion below is labeled by some word or phrase which is a partial paraphrase of the use illustrated in the section.

Visual acuity. The contexts supporting the meaning of visual acuity contained expressions of losing, damaging, restoring, etc., (one's) sight. Some examples from the corpus (again, shortened and sometimes simplified):

Possessive pronoun + SIGHT
My sight went fuzzy
A month later her sight had returned to normal
surgeons were able to restore her sight

Bare noun NP, abstract
pressure within the eye which may lead to loss of sight
often restoring sight by simple cataract operations.
in macular degeneration, sight is threatened by a blot in the eye

From the point of view of the visual perception semantic frame, we would have to say that in this use of SIGHT the word indicates the functioning of the organ which enables visual perception. In this sense the word SIGHT competes with the word VISION.

The faculty of vision. Such sentences generally referred to the capacity for information processing by means of visual perception.

established connections between sight and touch
it arises from our senses of sight, touch, hearing, and the rest
Horses communicate by sound, sight, smell, body language,

Scene. In many of the corpus lines, the word SIGHT occurred at the head of an indefinite singular modified predicating NP, referring to a scene, i.e., some arrangement of objects in the world capable of presenting visual stimuli. In some cases the modifier reported on the frequency or familiarity of the scene:

it's a familiar sight on the streets of Oxford,
concrete tile replacement roof surfaces is a common sight in older houses

In a great many cases the scene was evaluated according to the emotional or esthetic reaction it induced in the observer. Modifiers include such adjectives as *miserable*, *eerie*, *magnificent*, *spectacular*, *surreal*, *astonishing*, *delectable*, *sad*, and *sorry*, together with those illustrated in the following examples:

God! It was a revolting sight!
Architecturally it's not a pleasing sight.
The Nicholson 58 under full sail is a fine sight

The function of these expressions is to evaluate a scene in some way, so the word SIGHT is generally modified, either by a modifying adjective or by a post-modifying expression of certain types (*a sight for sore eyes, a sight to see*). Given that this is its function, we find that when the word SIGHT occurs alone in such a predicating context it conveys such an evaluation, usually negative.

I was a sight!

Wrong impression. This adverbial phrase AT FIRST SIGHT[23] almost always had the effect of characterizing some description as a false first impression, and frequently occurred in the presence of some explicit indication of 'seeming'.

At first sight, it looks like straightforward suicide but
At first sight it might seem that the higher price of int...
this is not as extensive as it appears at first sight

In a number of sentences lacking an explicit verb of seeming there is nevertheless the expression of some judgment which we are to assume was changed after further experience.

The images are quite baffling at first sight
one is haunted by his at first sight paradoxical defence of Milton
the very principle that made it at first sight so attractive

Visual experience as a source of emotional reaction. To speak of the noun SIGHT as designating a 'visual experience as a source of emotional reaction' is hardly a usable sense description. Yet we need somehow to recognize the striking fact that the vast majority of sentences with a SIGHT NP subject were sentences about what the experience of seeing something did emotionally to the observer, and by the fact that the vast

majority of sentences with phrases made up of AT THE SIGHT OF X were reports of emotional reactions. This was in striking contrast to sentences with SOUND NP subjects. The sentences from the corpus with SOUND had few expressions of observer reactions but show instead a prominence of expressions attributing something to the actual stimulus quality: THE SOUND OF X as a subject was frequently followed by mention of spreading, growing, fading, continuing, being interrupted, echoing, etc.

SIGHT NP subject examples:

OP explicit, marked with OF:

The sight of a word processor so terrifies me that I
The sight of his own face scared him.
the sight of flowers drove her into a frenzy.

OP implicit, understood in the context:

The sight and smell revolted him;
The sight enflamed Edge even more.
The sight must have frightened the watchers at Klein.

I include in this category passive sentences in which the SIGHT NP is introduced by the preposition BY.

OP Explicit

pleased by the sight of his own children's mental collapse.
I was scandalised by the sight of the poor, dead thing.
He was moved almost to tears by the sight of her.

OP Implicit

so shaken by the sight that he was rendered quite impotent

Most sentences with adverbials in AT THE SIGHT OF X were sentences about emotional reaction to a scene.

Her eyes brightened at the sight of his uniform.
flinching at the sight of what he thought was a maggot,
The winners swooned at the sight of the cheque

View. There are a great many static and dynamic locative phrases with SIGHT in which two objects are understood as situated in respect to whether or not one of them can see the other, one of them has the other *in view*. There are some generalizations to be made involving the order of PE and OP in such expressions, and the omissibility of PE or

OP. A contextually given OP could be omitted in the 'emotional reaction' uses above ("the sight horrified me"), but not with these expressions; in these expressions, with IN SIGHT, however, a contextually given PE can be omitted. There are constraints of various kinds which have not been clearly sorted out, involving, for example, the difference between IN and WITHIN, and the difference between bare-noun and definitely-determined SIGHT. We find roughly the following groupings:

PE (with)in sight of OP

OP in the sight of PE

OP in PE's sight

OP in sight (i.e., in PE's sight for some contextually given PE).

Most of the literal uses with IN SIGHT in our corpus had OP as the 'subject'[24] of IN SIGHT.

In simple copular sentences:
Fourteen months later, the old enemy was in sight again.
Even before they are in sight you can follow their progress by the roar ...

As a secondary predicate with HAVE:
he had the airfield in sight

As a secondary predicate with KEEP:
He had been keeping Fiona in sight out of the corner of his eye

As secondary predicate with WITH:
With the shore in sight and the light too dim for anyone to

Metaphor: imminent future. Metaphors based on the View sense just discussed freely allow both the PE>OP and the OP>PE order. Corresponding to the "OP" in the source domain is the potential future event, and corresponding to the "PE" is the person or agency likely to experience that future event.

"OP"-first examples:
The end of the War was at last in sight,
By February this year, a solution seemed in sight.
a political settlement was in sight.

"PE" first examples:
Middlesex are in sight of their seventh championship win
we are finally in sight of immunising all the world's children
The Germans came within sight of victory after Jutland,

Analogously to the IN SIGHT cases, static expressions indicating that something is not visible to somebody can use OUT OF SIGHT. The PE can be introduced with a possessive pronoun determiner on SIGHT or with an OF-phrase. (We can recognize metonymy in the window example below.)

With copular sentences:
so far behind him that it was almost out of sight,
Once he knew he was out of sight

Secondary predicate with KEEP, intransitive:
the safest thing is to keep out of sight, you know?
hovering in the lobby, keeping out of sight of the window...

Secondary predicate with KEEP, transitive:
designed to keep the loathsome object out of sight.
The Americans are keeping the Forrestal out of sight

Miscellaneous secondary predicate uses
but with his concealed troops well out of sight.
He liked them out of sight, not teasing his curiosity.

Expressions about coming INTO SIGHT describe situations in which a PE becomes able to see an OP. An OP can enter the visual field of a PE if the OP moves or if the PE moves. In our corpus the examples almost always involved OP-first arrangement, independently of whether it was the PE or the OP that was moving.

OP is moving:
the train came chugging round the bend and into sight.
a flock of incandescent flamingoes break into sight from around the island,

PE is moving:
but when the final stretch of the path came into sight
a sacred stained-glass window hoved into sight on the backdrop:
The trees of Rington Square came in sight

Analogously, when things move so that a PE can no longer see an OP, one can use the adverbials FROM SIGHT or OUT OF SIGHT. Almost all of the corpus examples are OP-first; for some we understand that OP is moving, for others that PE is moving.

OP is moving:

The SS corporal ducked out of sight
Lord John turned and hurried out of sight.
and slithers out of sight into a darkened pit.

PE is moving:

once a river turned a corner out of sight
winding road that unnervingly dips out of sight

A lone example of PE-first:

PE first, PE moving:

"Oh, my God," said Paula as they drove out of sight of the frontier post,

Glimpse. The collocation CATCH SIGHT OF has a meaning very similar to that of GLIMPSE: the visual perception is brief and achieved suddenly.

one gets wind of them long before one catches sight of them.
Turning from him she caught sight of herself in the long mirror.
The barman swung around fast to catch the sight.

Lose. By contrast, the collocation LOSE SIGHT OF X is occasionally used to refer to PE's no longer being able to see the OP, but by far the most common uses (next section) are metaphorical. The literal uses we found include these:

setting sail in a ship, when one finally loses sight of the land.
I got bowled over twice and lost sight of Greg completely,
then she lost sight of Jane as the Duke of Wellington's party

Neglect. In its metaphorical use, LOSE SIGHT OF means something like ignore, forget about, neglect the importance of, or the like. Almost all of the examples are negative and admonitive. A small sample:

don't lose sight of your own personal or professional interests
but you shouldn't lose sight of the importance of life's routines
without losing sight of the tragic nature of Jewish experience,

Scene or experience in SIGHT NP direct objects. With RISK we noticed special collocations with RUN and TAKE, and we noticed a range of uses as objects of various classes of verbs. With SIGHT as well we have noticed collocational pairings with CATCH and LOSE, and now we look at the other verbs that can take SIGHT NPs as direct objects. As with the verbs which take RISK-NP direct objects, those which take SIGHT as direct object also seem to fall into a limited number of classes.

In one group we find that a situation is described as presenting a scene to observers:

A glance to seaward revealed a sight that never ceases to amaze
Vesuvius presented an awesome sight

A number of verbs taking SIGHT NPs as direct object are verbs that mean 'experience', including, strangely enough, the verb SEE itself.[25] Examples:

no one else seems ever to have encountered such a sight
I beheld on alarming sight.
we were to witness the astonishing sight of the man who ...

all he could see was the blinding sight of a man's body hanging
As he reached the front door he saw a strange sight.
privileged to see the unique, unrepeatable sight of a stream of

Another group of general verbs taking SIGHT NP objects are those which express the observer's emotional reaction:

The public seem to hate the sight of it.
at least the people were spared the sight of donkeys in knickers
an acquaintance who can't stand the sight of a nursing toddler.

Lastly, we find verbs of memory:

you recall every sight and sound, every colour and hue
he never forgot the sight of a dead German soldier;

Miscellaneous. There are many special uses of SIGHT, from BY SIGHT and ON SIGHT collocating with KNOW and SHOOT, respectively, to compounds like SIGHT

GAG, SIGHT READING, SIGHT TRANSLATION, GUN SIGHT, LINE OF SIGHT, to idioms like SIGHT UNSEEN. Since we have only looked at a small portion of the full collection, we have to be ready for surprises.[26]

5. The lesson

The lesson to be drawn from these exercises is that it is generally not possible to define or understand a semantically complex noun in a context-free way, since a great deal depends on its interaction with its context, and a great deal of this interaction is conventional rather than compositional. One might think that the lexicologist's or the lexicographer's first responsibility is to provide a definition and a usage description for just those cases in which the noun participates in a straightforward way in general compositional principles connecting the noun with its contexts, relegating all of the rest to some theory of idioms, or to an idiom dictionary. For most of the examples with RISK and SIGHT, what we have seen are ordinary, everyday uses of the word, calling on the same semantic frame needed in the description of the associated verb, and participating in myriad other syntactic and semantic generalizations of the language as well.

The familiar commercial dictionaries have the luxury of being able to give seemingly context-free definitions, relegating context-sensitivities to the examples, as in the following selections from the SIGHT entry in *Webster's Third International Unabridged Dictionary*:

> 1a. something that is seen or beheld
> <a sight more familiar to our forefathers than to us>
>
> 2a. a thing regarded as worth seeing - used usually in plural
> <a tour of the sights of the city>
>
> 2b. something ludicrous, surprising, shocking, or disorderly in appearance
> <you must get some sleep, you look a sight>
>
> 5a. the process, power, or function of seeing: the animal sense whose end organ is the eye by which the position, shape and color of objects are perceived or received as stimuli through the medium of light proceeding from them
> NO EXAMPLES
>
> 5d. power of seeing exercised by a particular individual
> <I made my pledge in the cathedral in the sight of God>

6a. the act of looking at or beholding
<fainted at the sight of blood> <I know him only by sight>

7a. the perception of an object by the eye: presence in the field of vision
<caught sight of the fox> <lost sight of the plane in the clouds>

at first sight: without investigation or analysis

in sight: within a reasonable distance in space or time
<able to keep the quarry in sight> <victory is in sight>

on sight: at sight

(Omitted from my extraction from the W3 entry are dialectal or obsolete uses, or senses that were not found in the part of the corpus examined so far. 5d was included because I found it mysterious.)

It is not possible for the reader of this or any other ordinary dictionary, to discover facts about possible and impossible lexico-grammatical contexts, or about how the various senses relate to each other in terms of a general understanding of the conceptual structure of visual perception. In a formally precise lexicon, designed within a general theory of lexical semantics or created for the purpose of natural language processing or machine translation, much more is to be expected. The magnitude of what is needed for such purposes is quite staggering, to be sure, but researchers need to have the full utopian view in mind before deciding on a more realistic set of objectives.

Notes

1. I have in mind studies of verb valence, thematic roles, subcategorization frames, complementation structures, etc. My own occupation with the grammar and semantics of verbs began with my participation, in the early sixties, in William S-Y. Wang's Project On Linguistic Analysis at the Ohio State University, and my earliest pieces on verb grammar were printed in the Working Papers of the POLA project.

2. Since I am simplifying the world anyway, I allow myself in this discussion to ignore predicating adjectives, nouns, and prepositions.

3. Charles J. Fillmore & Beryl T. Atkins 1992, "Toward a frame-based lexicon: the semantics of RISK and its neighbors", in Adrienne Lehrer and Eva Feder Kittay, eds., *Frames, Fields and Contrasts: New Essays in Lexical Organization*, Lawrence Erlbaum and Associates, pp. 75–102. Charles J. Fillmore & Beryl T. Atkins 1993, "Starting where the dictionaries stop: a challenge for computational lexicography," in B. T. Atkins and A. Zampolli, eds., *Computational Approach to the Lexicon*, Oxford University Press.

4. On the question of whether a complete account of word usage can be based on corpus evidence alone, see Charles J. Fillmore 1992, "'Corpus linguistics' vs. 'Computer-aided armchair linguistics'",

Directions in Corpus Linguistics (Proceedings from a 1991 Nobel Symposium on Corpus Linguistics, Stockholm), Mouton de Gruyter, pp. 35–60.

5. The treatment of FEED borrows from a recent discussion, in lecture, of the dependency structure of this verb on the part of Peter Hellwig of Heidelberg University. Since what I need for this initial illustration is an example with no problems, I am basing it on hasty introspective evidence. The experience of looking at real corpus data always brings surprises, so I have deliberately not looked at corpus-lines for examples of FEED. I trust the reader will forgive this reversion to type, in view of the point I want to make with this example.

6. The corpus was that of the American Publishing House for the Blind; the concordance of RISK sentences was provided by colleagues at IBM Hawthorne, New York.

7. Classification as "Deed" or "Bad" requires some interpretation. In a sentence like *If we go there we risk meeting Harry* it is natural to interpret *meeting Harry* as something (undesired) that might happen to us. But in *I wouldn't risk letting you meet her* it is my act of letting your meet her which I intend to avoid. In *He risks committing grave mistakes,* the phrase *committing grave mistakes* is to be taken as an interpretation or evaluation of what he is doing rather than a description of his actions.

8. The "Deed" NP objects do not necessarily, in isolation, designate acts. To risk a pause is to pause in a conversation under the danger that one's interlocutors will take the floor. To risk a venture is to risk embarking on a venture. To risk free elections is to set up free elections in the face of the danger that one's opponents will win.

9. The need to recognize various subframes — hence the expression here, "family of semantic frames" — is discussed below. The frame elements of Deed and Goal are added to a basic frame, in the way that we saw the element of Means added to the frame needed for FEED above.

10. The careful reader will wonder why it is necessary to distinguish PO from BA, since instances of risk-PO can readily be paraphrased as risk-losing-PO, and "losing-PO" can easily be classified as BA. This could suggest that the semantic role here labeled PO is a metonym for BA. (*He risked his life/reputation/inheritance = He risked losing his life/reputation/inheritance*) There are two reasons why we did not make such a decision. The first is that there are two distinct ways of indicating PO and BA as noun complements, with the prepositions OF and TO, respectively: *the risk of failure, the risk to one's reputation*. The second is that PO is judged by most speakers as the intuitively primary relatum to RISK, supported by the impression we have that it is the only nominal object type which freely participates in passivization. (The answer to *What has been risked?* is likely to be PO rather than BA or DE.) We were unwilling to treat what we thought to be a basic use be as metonymically derived.

11. This second qualification was suggested by Paul Kay, to take into account such agentively-understood non-deeds as is suggested by *Are you willing to risk being the only person who knows the combination?* The context for the gerund to be taken as a "DE" in our schema is one in which the addressee is seen as choosing to undertake this responsibility, or choosing not to escape it.

12. The difference intended here between a verbal gerund and a clausal gerund is that the verbal gerund has its unexpressed subject controlled by the subject of RISK and a clausal gerund contains an explicit subject.

13. The separation into three senses follows the practice of traditional lexicography, where clear paraphrasability differences require the separation into sense differences. But a frame semantic account could treat such differences, not as differences in the meaning of the verb, but as differences in frame-element realization. That story will be told elsewhere.

14. Of course, for a number of the sentences in our corpus there was not enough context to know which of these "senses" was intended. It should be pointed out that the distinctions recognized in the annotations designed for constructing the database are not necessarily going to show up in the lexical descriptions of the words. The difference between 'risk:active' and 'risk:intentional', for example, appear to figure more clearly with the noun than with the verb.

15. The grammatical theory against which I allow myself to speak of the "proper way to describe a word" is Construction Grammar, for which readers may soon be able to consult Charles J. Fillmore and Paul Kay, forthcoming, *On Grammatical Constructions.*

16. From this description it may look as if what is needed is merely a huge unorganized list, but that is not true. The grammatical and semantic components of a word will independently — perhaps through mechanisms of 'inheritance' — call for various types of complements. For example, a verb that is capable of describing intentional acts will automatically welcome expressions of purpose, means, and the like. Thus, to say that RISK (in some of its senses) welcomes such adjuncts is not to ascribe such possibilities to the verb directly but by way of recognizing that the verb is capable of designating intentional acts.

17. Idiomatization of the verb is also possible of course ("to risk one's neck"), but only within the immediate complementation structure of the verb.

18. I owe this point to Paul Kay.

19. Here, too, I resort to an invented example. Since, as I believe, the relationship between 'risk:passive' and 'risk:active' is one of markedness, as is the difference between 'risk:active' and 'risk:intentional', there as many uses in which the difference cannot be known. Every instance of taking a risk is also an instance of running a risk; but there are some instances of running risks that are not simultaneously instances of taking risks.

20. DELIS is coordinated by Ulrich Heid of the University of Stuttgart. Collaborators on the English-language team are Beryl T. Atkins and Nicholas Ostler.

21. SIGHT, of course, is not the only noun that calls on the visual perception frame for its interpretation. VISION is another.

22. This time the examples are Key-Word-In-Context lines, taken from a British English corpus developed by Oxford University Press of 17-million-plus running words. The concordance lines were extracted and sorted, by Atkins and me, using facilities provided by the Digital Equipment Corporation Systems Research Center in Palo Alto, California. As above with the RISK examples, these too have been shortened and otherwise modified for reasons of space. With respect to the punctuation, initial capitalization will indicate that the extracted element is the beginning of a sentence, and a final period will indicate that it is at the end of a sentence.

23. In contrast to the modifying use in the fixed phrase *love at first sight.* From folk beliefs about love-at-first-sight, the experience is generally held to be valid, and hence it does not fit the false-first-impression usage common with the adverbial use.

24. The notion 'subject of IN SIGHT' is to cover the "X" of "X was in sight", "we kept X in sight", "having X in sight", etc.

25. With the plural noun SIGHTS, referring to places of touristic interest, SEE, of course, is quite common.

26. In this preliminary presentation of the SIGHT results I have not tried to offer precise figures on relative frequencies of uses. In preparing this paper I have been working with only a small sample of the whole, and within each grouping I have large numbers of KWIC lines which are not long enough to permit accurate classifications. A more detailed report, with B. T. Atkins, is planned for the future that will not be limited to "at first sight" impressions.