"Lexicography and Ethnographic Semantics"

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Preamble

I'm going to say something about the kind of lexical resource that we could ideally have in an electronic age, so I'll begin with a common computational analogy. For any given major dictionary project, we can think of the information that has accumulated in the publishing house during the period of work on the project – including the citation files – plus all of the wisdom and experience of the compilers and the experts they consulted, as a vast data–base; and we can then think of the dictionaries that resulted from this project as various kinds of user interfaces, these taking the form of historical dictionaries, children's dictionaries, college dictionaries, language learners' dictionaries various sorts of specialist dictionaries, and the like, all differing from each other according to the perceived needs, interests and abilities of the intended users.

The first point I want to make, then, is that we can now imagine regimenting, organizing and electronically storing such a huge database, we can imagine building dictionaries whose entries are somehow indexed to it, and we can imagine all of this in some sort of hypertext or Mosaic system allowing users to move easily from place to place within this complex body of information.

The second point I want to make is based on the truism that it's difficult to draw a clear line between a terminological dictionary and an ordinary dictionary. Since I don't like such uncertainties, I ask you to imagine an idealized lexical resource in which the distinction does not exist. What I mean by that is that all lexical descriptions, including those for the language's most common words, will be shaped according to the kind of knowledge we assume users will bring to the dictionary, and that an essential part of the lexicographer's job is to articulate that knowledge.

The third point, related to the second, is that in order to see clearly the nature of the knowledge structures behind the general vocabulary we, the analysts, may need to be able to "exoticize" the meanings of our ordinary words, even for preparing monolingual dictionaries. For a bilingual dictionary linking the languages of two vastly different cultures, it would be valuable for the description of words meanings to be attached to, or indexed to, ethnographic descriptions of the beliefs and lifeways of the speakers of the languages being linked.

For the kind of exoticization that I have in mind, it would even be useful to include all of those beliefs and experiences that are universal in human experience, if only to be able to make explicit the basis for inferential

1

reasoning and for understanding clearly the conceptual networks within which the words of the language are connected with each other – this connection seen as the manner of their fit with the underlying conceptual network which motivates their existence. In other words, we don't have to imagine that we are preparing to produce an English–Flatlandic dictionary to give us a reason to be clear about the lexical–semantic consequences of living in a three–dimensional world affected by gravity. The fourth point, then, amounts to the suggestion that we somehow unite the interests and purposes of linguistic semantics, lexicography, and natural language processing researchers, in the direction of maximizing reference to the conceptual or experiential base of lexical meanings. I insist that itt would be wrong to see this as an instance of confusing language with the world, or of failing to understand the difference between a dictionary and an encyclopedia.

Frames

For speakers of English, knowing how to use, and how to understand the uses of, the preposition **in**, in its most basic location–specifying meaning, requires having access to a conceptual structure that we can refer to as *containment* in terms of which it is possible to locate one entity, linguistically, with reference to the interior of another entity. Knowing the preposition **on** and how to use it (the books on the shelf, the mirror on the wall, the fresco on the ceiling) requires a schema involving *surface contact* and *support*. These same schemata must be seen as underlying the semantic properties of other prepositions and preposition–complexes in English, such as **into** and **out of** alongside of **in**, and **onto** and **off of** alongside of **on**.

Here is where the process of exoticization is valuable. It is easy for speakers of English to believe that these notions are simply natural concomitants of being human. Such primitive conceptual structures are undoubtedly available, cognitively, to speakers of any language, but it is a fact about the English language that they are among the fairly small number of schemata which shape the ways in which English speakers most naturally communicate about spatial relations. The spatial schemata employed in the semantic structure of the system of grammatical morphemes or of function words can vary strikingly from language to language, as is brilliantly demonstrated in a number of papers by Melissa Bowerman of the Max Planck Institute for Psycholinguistics in Nijmegen on spatial location expressions in English, German, Dutch, and Korean.[1]

Knowing these words requires us to know the spatial–organizational schemata that underlie them. Implicitly, all speakers of English possess these schemata, but it may take the analyst a great deal of effort to tease out their nature.

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[1]Bowerman (1989, to appear)

Speakers of English who understand the meaning of the word **purgatory** have to be aware of a conceptual structure of considerable complexity, connecting many parts of one variety of Christian doctrine. Such a structure includes notions of sin and retribution, heaven and hell, grace and salvation, and a whole host of others, all of these intimately connected with each other and with the notion of purgatory.

We can have no real understanding of the point of having a concept like **purgatory** if we are unaware of these related concepts. More specifically, the soul of a dead person has four possible abodes: heaven, hell, purgatory, or limbo. You more or less have to understand the whole plan in order to understand any one part of it. (I don't actually know whether all of this is a part of Roman Catholic doctrine, but it is at least a well–defined part of folk versions of Roman Catholic doctrine.)

Knowledge of the psychoanalytic concepts of **id, ego,** and **superego** presupposes an awareness of Sigmund Freud's theory of primitive psychic energies and the manner of their control and modification in the maturing individual. None of these terms can be understood without understanding the concepts linking them together. It would obviously make no sense to define each of these terms separately, without making at least indirect reference to the elaborate complex of ideas developed by Freud, or at least those parts that have entered the discourse and consciousness of ordinary educated users of the English language.

The background conceptual structure that provides the matrix or scaffolding for the meaning of a word (in a given sense) or a group of semantically related words or word senses is something we can refer to as a *frame*. It should be clear that the full description of the meanings of most – perhaps all– lexical items will have two aspects, a "frame –external" aspect, identifying and characterizing the frame, and a "frame–internal" aspect, which specifies the portion or aspect of that frame which makes up the meaning of the word. The frame–external aspects of **hypotenuse** are whatever it takes to be a right–angle triangle; the frame–internal characteristic of hypotenuse is its being the side opposite the 90 degree angle.)

The effort to discover and characterize the frame–external features of a word's meaning can be seen as a kind of ethnography. What needs to be discovered is the system of beliefs, experiences, practices, institutions, or ready–made conceptualizations available to the speakers of the language as the necessary underpinnings of the ways they speak and the ways they "think for speaking" (Slobin 1991).

A theory of word meaning that sees the need to include analyses of frame structures in an account of the organization of a lexicon can be spoken of as a variety of *frame semantics*.[2]

Lexicographic Practice

Dictionaries sometimes help users by anchoring their definitions in such matrix structures, but sometimes they fail to do this altogether. A definition one finds in the Collins English Dictionary – with no subject field tag – reads as follows: "a regular stream of vortices shed from a body placed in a fluid stream". (The term being defined is **Karmen vortex street**.) An innocent reader confronting this definition will wonder how fluid streams differ from ordinary streams, what it takes for a stream to be a regular streamt, what it means for a body to shed a vortex, etc., and this reader will not get quick help by looking up the words **fluid, stream, body, vortex,** or **shed**.

Sometimes lexicographers direct attention to the frame by means of domain labels such as *Theology, Navigation,* or *Psychoanalysis,* as in the Collins English Dictionary definition of **ego** in its Freudian sense:

ego 2. *Psychoanal.* the conscious mind, based on perception of the environment from birth onwards: responsible for modifying the antisocial instincts of the id and itself modified by the conscience (superego).

The label *Psychoanal.* is a reference to the larger conceptual framework, and the definition itself shows something about the connection between **ego** and two other basic concepts – **id** and **superego** – within that framework. A dictionary reader who does not find the definition sufficiently informative as it stands at least knows where to go to acquire the missing background.

And sometimes lexicographers combine frame–internal and frame–external information in single defining statements. Again, from Collins.

reincarnation n. **1.** the belief that on the death of the body the soul transmigrates to or is born again in another body

Here the definer wishes to communicate the idea that this account of what happens to the soul upon the death of the body is a part of a belief system. In a dictionary prepared for people whose religious beliefs accept reincarnation, the word would not be defined as a belief. Collins offers a separate definition just for believers:

reincarnation n. ...**2.** the incarnation or embodiment of a soul in a new body after it has left the old one at physical death

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[2] On frame semantics see Fillmore 1982, 1985, 1989, Fillmore & Atkins 1992, 1994.

(I don't know why the imputed belief sense was listed first.)

Now I have just been heard second–guessing the work of a team of lexicographers I greatly respect, but I have not asked any of them for the reasons behind definition 1. It may be that the citation files contained expressions that motivated the description of **reincarnation** as the name of a belief. A citation like "Reincarnation is a part of Hindu dogma" could be taken as evidence that the word can refer to a belief. I hope, however, that their evidence is stronger than that. Imagine with me the long list of expressions that could follow the words "My religious beliefs include . . . ")My religious beliefs happen to include malevolent forest spirits, conscious life after death for household pets, the ultimate conquest of good over evil, etc.) and then join me in insisting that it would be wrong to explain each of those phrases as capable of meaning both "X" and "a belief in X".) A more convincing context would be something like "Reincarnation is shared by Hindus and Buddhists" – but that sentence, supposedly expressing the idea that a belief in reincarnation is shared by the two religions, sounds thoroughly unnatural to me.

My Position

In this paper I wish to support a practice of lexicographic research and presentation which clearly separates frame–external and frame–internal information, while including both within the lexicographer's assignment. My view on the need to link language and the world is close to that of Keith Allan, who writes:

If we are to say anything worthwhile about their meanings, the contents of the senses of certain words must draw on background information about the entities spoken or written of: this information may be based on any or all of experience, convention, custom, myth, and language use. ... Influence is exerted from a host of imagistic, associative and formal as well as pragmatic factors that coalesce and mutually reinforce one another. ... If semantics is to go beyond translating symbols into yet more esoteric symbols, it must begin to reflect the richness of human experience that is intrinsic to language understanding: ...
Allan (1992, pp. 371.372)

Linguists, lexicographers, and AI researchers in Natural Language Processing have different perspectives on the need to associate world knowledge with the description of lexical items. NLP researchers tend to link words with our understanding of things and beliefs about them in a maximal way, since the extent to which this information can be triggered by the words of a text reduces the need to count on a complex inference engine. Linguists tend to minimize this connection, since they recognize multiple sources of explanation for the relation between utterances and their meanings. Lexicographers have practical rather than ideological reasons for

making such decisions, and different lexicographers can make different choices with respect to the same material.

A Simple Example

A simple example will help us to focus on the kinds of problems that I see in connection with the separation of linguistic from non–linguistic knowledge and the obligations of the student of the lexicon. Suppose we want to say something about the sentence

She came to a red light

Somebody who does not know what is going on at this point in a narrative clearly needs to know that in the signalling systems that cities set up for controlling automotive and pedestrian traffic–flow at important intersections or crossings, green lights are used to indicate that those facing it are free to proceed, and red lights are used to get the traffic approaching it to stop, and then to wait until the green light goes on. The interpretation includes a social reality that the protagonist of this sentence at this point in the narrative is facing an obligation to stop her vehicle.

Our first question, then, is whether a dictionary (or "lexicon") created according to the needs of each of our three professions can be expected to contain information that could lead a user, human or machine, to the full interpretation of the clause, and whether such information should be introduced in association with the word **red**, or the phrase **red light**.

Since a computer does not have the kinds of experiences that the rest of us have had, the NLP researchers would definitely want to build into their systems an ability to derive such information, and it would of course be necessary to start from the linguistic form, in particular the phrase **red light**, perhaps reinforced by information about the larger phrase **come to a red light**. Suppose our sentence continues as follows:

She came to a red light, but she kept on driving

The system ought to generate a number of tentative partially specified expectations and inferences for this portion of the narrative, perhaps assumptions about the driver's temporary inattentiveness, or the urgency of her errand.

Most linguistic purists, on the other hand, are likely to feel that the semiotic function of the colors red and green in systems of traffic lights worldwide are facts about the world, not facts about the *meanings* of the *English words* **red**, **green** or **light**. It just happens that communities throughout the world use red and green lights at intersections to serve certain traffic control purposes, and knowing and using facts like these is clearly distinct from knowing the

lexicon of English. The linguist's reponsibilities stop short of the full interpretation.

Lexicographers, given their more practical goals, might have reasons for deciding either way.

Before consulting any dictionaries about this question, the guess I made was that they would indeed have entries for **red light** and **green light**, but only in order to provide the needed link to the metaphorical meanings of these phrases. I formed this opinion by reasoning about the occurrence, in many dictionaries, of the definition "one that reads" or "a person who reads or is reading" as the primary sense of the noun **reader.** The reason seemed to be that since the word needed to be included in the dictionary because of its other senses, it would be wrong to omit its basic sense. Another possibility might be that if a dictionary was concerned with making explicit the nature of the connections among meanings of multiple–meaning words, its reason for including the fully transparent meaning of **reader** was so that the extended senses of the word could be seen as specializations of the primary sense.

What I found in the dictionaries I examined was (1) that those that gave traffic–light definitions of the phrasal entries **green light** and **red light** did not show any explicit connection between these literal senses and the metaphorical senses based on them, and (2) that the dictionaries that did motivate the metaphorical sense explicitly referred to information about traffic lights, not information about the primary "meanings" of the phrases.

Before looking at specific entries, let us turn to one of these metaphorical uses. Suppose we wish to interpret the sentence

Our project was given the green light.

The interpretation, of course, is that our project was approved, it was given permission to proceed.

The lexical specialist needs to decide whether the phrase with **green light** is a conventional way of expressing what it expresses – and therefore deserves a place in a description of the language – or whether with this sentence the writer is merely counting on the reader's ability to use a common experience to get at the intended figurative meaning. The linguistic purist might say (at first) that this is merely a normal instance of figurative language, a kind of transparent metaphor. People who know the relevant facts – the argument would go – can easily come up with the right interpretation, They don't need the semanticist to do that work for them. Again, the work of the linguist as linguist ends early in the path from utterance form to utterance interpretation.

7

NLP researchers who need a short–term solution to this problem might simply identify the phrase as meaning 'to give approval'; those who want their systems to recognize, or to be able to work out, the metaphoric interpretation might want to do otherwise.

This is what I found. All of the dictionaries I consulted did in fact list a special sense for **green light**, in its figurative use, and for various reasons I think that is the correct decision. But now we have some new problems. First, should the phrase merely be defined as involving approval *tout court*, or should information about the *motivating context* be provided? Second, if we make the latter move, should that information be seen as indicating a relation between *senses* of the phrase? (That is, is it a part of the *polysemy structure* of the phrase **green light**, and if so, is the recording of such facts a part of the responsibility of lexicographers?) In other words, would the inclusion of such information be a proper part of a linguistic description, or should it be thought of along the lines of interesting stories about words and their meanings?[3]

Traffic Lights and Dictionaries

All five of the dictionaries I examined had separate entries (or sub–entries) for the phrases **green light** and **red light**, if only for the metaphoric uses. But they differed in their treatment of the literal interpretations of these phrases as names of parts of traffic signalling systems. In describing the various practices with these phrases, let me refer to (i) the colored lights in such a signalling system and (ii) their signalling functions ('proceed' vs. 'stop') as *form* and *function*, respectively. We can then say that only the American Heritage Dictionary clearly identified each of these phrases with both the form *and* the function of the colored traffic lights. Notice the first senses in the following entries.

AHD3
green light *n* **1.** The green–colored light that signals traffic to proceed. **2.***Informal.* Permission to proceed.

red light *n* **1.** The red–colored light that signals traffic to stop. **2.** *Informal.* A command to stop.

The categories are specified both in terms of the physical characteristics of their members (green light, red light) and the signalling functions they serve.

The Collins English Dictionary seems to take the function as primary, but adds information about the color of the lights after "esp." Webster's Ninth

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the long catalogue of amours recited by Don Giovanni's servant Leporello in Mozart's opera)" (Svensén 1993, p. 165)

Collegiate Dictionary gives the same treatment to **red light**. Notice the first senses in each of the following:

Collins
green light *n* **1.** a signal to go, esp. a green traffic light. **2.** permission to proceed with a project.

red light *n* **1.** a signal to stop, esp. a red traffic signal in a system of traffic lights. **2.** a danger signal. **3.** an instruction to stop or discontinue.

W9
red light *n* (1849) **1**: a warning signal *esp*: a red traffic signal **2.** a cautionary sign: DETERRENT

(I have never learned whether the "esp." in a dictionary entry is intended to express a statistical generalization or to point to a semantic prototype.)

For each of these phrases, the Concise Oxford Dictionary mentioned only the function. To judge from the first senses in the entries excerpted below, an arm–waving traffic officer could presumably be spoken of as giving green and red lights merely by pointing.

COD8
green light 1 a signal to proceed on a road, railway, etc. **2** *colloq.* permission to go ahead with a project.

red light 1 a signal to stop on a road, railway, etc. **2** a warning or refusal.

One can imagine that the compilers assumed that readers would begin with a compositional meaning of the phrase and regard the signalling function as simply adding more information. In a world in which most blackboards are green, lexicographers should let us know when a color name really does refer to the named color.

For **green light** Webster's 9th Collegiate Dictionary and Webster's New World Dictionary give only the metaphorical use, but each of them *motivates* the expression with "from..." or "after..." followed by reference to both the form and the function of the green traffic light. WNW notices the collocation with **give** and **get**.

W9
green light *n* [fr. the green traffic light which signals permission to proceed] (1937): authority or permission to proceed esp. with a project

WNW 2nd coll ed
green light [after the green ("go") signal of a traffic light][Colloq.] permission or authorization to proceed with some undertaking; usually in **give** (or **get**) **the green light**.

One doesn't expect dictionary compilers to take a stand on the nature of metaphoric sense extensions, but one can't help noticing that none of the dictionaries explain metaphoric senses as extensions from non–metaphoric *senses* of the same term. In these last two cases, the motivation is from the practice, not the words, and in all other cases, the separate senses are simply given in a list.

In giving an account of the metaphorical meaning of **green light**, the necessary frame information becomes quite specific. Since in the traffic light situation, red and green lights alternate, it is clear that somebody who is waiting for the green light is stopped. In the figurative use, then, the people interested in going ahead with a project have been standing still, prevented from going ahead, waiting for the event of "getting the green light" to occur – waiting for the light to turn green. The structure of the metaphor matches in a number of ways the structure of the practice.

There is no avoiding specific mention of the traffic signalling system when we consider the phrase **run a red light** or **run through a red light**. Since these expressions have no straightforward "compositional" interpretation, that easily fit other uses of the word **run**, they must be idioms, and hence they deserve a place in our dictionary.[4] In this case, an interpretation that did not include reference to the actual traffic light situation would clearly be mistaken, since these expressions are intended "literally" in the sense that the image the user needs is of a vehicle violating a very specific rule of traffic. An explanation of the meaning here has to communicate an understanding of the nature and workings of electric traffic lights.

One other word that seems to belong to our story is **amber**. I suspect that there are speakers of English for whom the word **amber** is associated mainly with its use in talking about traffic lights, and I also suspect that if it weren't for this ready–made linguistic association, there would be no particular reason to use the word **amber** in this context rather than, say, **orange** or **yellow**. Collins and COD8 both give form–and–function definitions, not for a phrase **amber light** (in parallel with **red light** and **green light**) but for **amber** as a noun.

Collins
amber *n*. 4. an amber traffic light used as a warning between red and green.

COD8
amber 2 a yellow traffic–light meaning caution, showing between red for 'stop' and green for 'go'.

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[4] Although I have just claimed that this idiom deserves a place in "<u>our</u> dictionary", I must admit that I haven't found it in anybody else's.

Now since it is *necessary* to say something about "the world" in the entry for **run a red light** (and, according to Collins and COD8, in that for **amber**), and it is *useful* to give that same information in the explanation of (**have/get/give someone) the green light** – that is, since there are reasons in some parts of the lexicon to refer to the institutional and artefactual background that motivates the existence of these terms – a reasonable argument could be made for linking all relevant dictionary entries with information about this system. That list of items requiring this connection would include a number of semantically quite complex terms, such as **protected left turn**, for English, and **grüne Welle** for German.

Ethnographic Semantics

There is an important reason why we have had the luxury of worrying about whether information about traffic signal systems does or not have a place in the design of a dictionary of English, and that is that we all already know every relevant fact about this essentially universal semiotic system. But a lexicographer from Mars building a dictionary of English would be considered irresponsible not to include the necessary cultural background. An English–Martian dictionary would have to incorporate, or be attached to, an ethnography that described the lifeways of English–speaking people and identified the ways in which members of the culture linguistically dealt with aspects of those lifeways.

We often call on fictitious Martians to help us exoticize things that are close and familiar to us, but we find such efforts less compelling now that we know there is no likelihood of articulate beings living on that planet. So a genuine exotic context might be more useful in making my point. In a study of Trobriand Islanders' terms for body and mind, Gunter Senft quotes Malinowski's discussion of Trobriand notions of "mind" and "memory".

The mind, *nanola*, by which term intelligence, power of discrimination, capacity for learning magical formulae and all forms of non–manual skill are decribed, as well as moral qualities, resides somewhere in the larynx. The natives will always point to the organs of speech, where the *nanola* resides. ... The memory, however, the store of formulae and traditions learned by heart, resides deeper, in the belly. A man will be said to have a good *nanola* when he can acquire many formulae, but though they enter through the larynx, naturally, as he learns them, repeating word for word, he has to stow them away in a biger and more commodious receptacle; they sink down right to the bottom of his abdomen.
(Malinowski 1922 408f, Senft 1993 pp. 1–2.)

It seems obvious that no ethnographic semanticist preparing a dictionary of the language of Trobriand Islanders would find it satisfying to give a minimal "definition" of **nanola** as, say, 'mind' arguing that the facts about its specializations (including the memorization of magical formulae) and its location (in the larynx) belong in an encyclopedia of Trobriand culture, an

encyclopedia that is in no way connected with the dictionary. We can't really understand the word, I would claim, if we didn't understand the accompanying beliefs.

The piece of "ethnography" connected with a dictionary that gives clear understandings of the use of the language connected with traffic signals would have to describe the physical, institutional, and legal concepts that make up the form and function of this institution. One can imagine a combined ethnography and dictionary which provided this information for the Martian; one can imagine an electronic resource which linked dictionary entries with encyclopedia entries; and one can imagine an efficient print dictionary that included key words expecting readers to consult their own knowledge of the domain. It would be wasteful, of course, for all of the details of the frame to be included in each relevant entry, but at some level or other, the world knowledge about the system has to be understood as conceptually a part of the information that ought to be available through a dictionary.

Frame Discrepancies

In ordinary dictionaries, reference to facts about traffic signals can be kept to a minimum for defining the terms we have just looked at. In the same way, the workings of gravitational force, through which we understand verticality, does not need to be described in definitions of **up** and **down, ascend** and **descend, raise** and **lower, top** and **bottom, high** and **low,** etc. – because all of the dictionary users that we can imagine have mastered all of the details of such frames.

But certain traditions of dictionary–writing give lexicographers problems precisely because not all speakers of the language share the same interpretive frames. For example, some of us do not have a religion, and those who do, do not all have the same religion. The possibility of frame conflict between compiler and user can be illustrated clearly, I think, with religious terminology.

If believing monotheists read a definition of **God** as "the principal object of worship in many monotheistic religions", they would be right in complaining that <u>that's not what the word means</u>. On the other hand, if atheists read a definition of **God** as "the Supreme Being who created and maintains the universe", they could complain that the producers of the dictionary are using language that presupposes something that they find objectionable. A frame–external description cannot satisfy someone who takes the frame for granted; a frame–internal definition cannot satisfy someone who rejects the frame.

With religious terms, dictionaries sometimes provide indirect access to the needed background information with domain labels such as *Hinduism, Theology,* or *Christianity.* But such practices are not consistently maintained.

Through the domain label *Christianity*, Collins presents **venial sin** and **mortal sin** as concepts within Christian belief systems. Of course one might object that the frame–external information is not sufficiently detailed: not all Christian doctrines include these notions.

Collins
venial sin n *Christianity*: a sin involving only a partial loss of grace. Compare mortal sin.

mortal sin n *Christianity*: a sin regarded as involving total loss of grace. Compare venial sin.

The American Heritage Dictionary assigns **venial sin** to the Roman Catholic Church, and in its definition **mortal sin** gives useful examples of the category and helps its readers understand the consequences.

   AHD3
mortal sin n. *Theology*. A sin, such as first–degree murder or perjury, that is so heinous it deprives the soul of sanctifying grace and causes damnation.

venial sin n. *Roman Catholic Church*. An offense that is judged to be minor or committed without deliberate intent and thus does not estrange the soul from the grace of God.

All of these definitions refer to grace, which is also defined as a Christianity–internal notion.

Collins
grace n 8. *Christianity*: a. the free and unmerited favour of God shown towards man b. the divine assistance and power given to man in spiritual rebirth and sanctification

Original sin, where all of these problems got started, on the other hand, is introduced in Collins without definition–external reference to a particular belief system, but is ascribed to Christianity in AHD..

Collins
original sin n a state of sin held to be innate in mankind as descendants of Adam

To judge from the language of the Collins definition, this is just the way things are. The hedge "held to be..." in this definition invites the inference that the definers have no doubts about the existence of this universal state of sin, but they do allow as matters of controversy its innateness and its origin in a decision made by our ultimate ancestors.

AHD3

original sin n. According to Christian theology, the condition of sin that marks all human beings as a result of Adam's first act of disobedience.

The American Heritage Dictionary here chose to give the frame–localizing information in the defining phrase rather than as a subject tag.

The connections between **sin** and **grace** on the one hand and **hell** and **heaven** on the other hand are not made explicit by the Collins lexicographers.

Collins
hell n 1. *Christianity*: (sometimes *cap*.) a. the place or state of eternal punishment of the wicked after death, with Satan as its ruler. b. forces of evil regarded as residing there.

heaven n 1. (sometimes cap.) *Christianity*: a. the abode of God and the angels. b. the place or state of communion with God after death

The American Heritage Dictionary sees **hell** as belong to "many religions" but has no frame–external marking on **heaven**.

AHD3
heaven n. Often **Heaven**. a. The abode of God, the angels, and the souls of those who are granted salvation.b. An eternal state of communion with God; everlasting bliss.

hell n. 1.a Often **Hell**. The abode of condemned souls and devils in some religions; the place of eternal punishment for the wicked after death, presided over by Satan.

With the words **heaven** and **hell** we become aware of some of the lexicographer's difficulties with this family of terms. At some level we would like a dictionary informed by a theory of frame semantics to show how the concepts and categories it introduces are related to each other, so that, for example, notions like grace and salvation and heaven, sin and damnation and hell, would all be connected. But since **heaven** and **hell** are concepts found in many religions, this would require separate treatment of these words for each of those religions.

Alternatives to heaven and hell are purgatory and limbo. Both Collins and AHD attribute **purgatory**, to Roman Catholic beliefs, while **limbo** is taken to be a more general notion. I don't know whether those judgments are correct.

Collins
purgatory n. 1. *Chiefly R. C. Church*. a state or place in which the souls of those who have died in a state of grace are believed to undergo a limited amount of suffering to expiate their venial sins and become purified of the remaining effects of mortal sins.

limbo n. 1. (*often cap.*) *Christianity.* the supposed abode of infants dying without baptism and the just who died before Christ.

AHD3
purgatory n. 1. *Roman Catholic Church.* A state in which the souls of those who have died in grace must expiate their sins.

limbo n. 1. Often Limbo. *Theology.* The abode of just or innocent souls excluded from the beatific vision but not condemned to further punishment.

The Collins writers felt it necessary to include the hedges "are believed to" and "supposed" even though the belief–context was provided with the subject labels. (I forgot to look up **beatific vision**.)

The word **God** is assigned to *Theology,* in Collins; it has no frame tag in the American Heritage Dictionary, but the belief context is shown with the phrase "conceived as."

Collins
God n 1. *Theol.* the sole Supreme Being, eternal, spiritual and transcendant, who is the Creator and ruler of all and is infinite in all attributes; the object of worship in monotheistic religions.

(There must have been some interesting in–house discussions at Collins leading to the use of upper–case initials – Supreme, Being, Creator – in their definition.)

AHD3
god n. 1. **God.** a. A being conceived as the perfect, omnipotent, omniscient originator and ruler of the universe, the principal object of faith and worship in monotheistic religions. b. The force, effect, or a manifestation of this being.

The Collins lexicographers present **Satan** without any qualifications: no hedging inside the defining statement and no domain–label covering the whole thing. The definition just tells you who he is. The American Heritage Dictionary assigns the concept to theology.

Collins
Satan n 1. the devil, adversary of God, and tempter of mankind; sometimes identified with Lucifer (Luke 4:5–8).

AHD3
Satan n. *Theology.* The profoundly evil adversary of God and humanity, often identified with the leader of the fallen angels, the Devil.

We have seen cases where the external–frame information is indicated with a domain label (e.g., *Christianity*), and we have seen cases where it is alluded to by a hedge inside the defining phrase (e.g., "held to be"...). There are also

cases of definitions which need such external reference but which lack them, making them essentially uninterpretable, similar to what we saw with **Karmen vortext street** earlier. The Chambers Dictionary definition of the transitive verb **reincarnate** is an example:

Chambers
reincarnate *v.t.* to cause to be born again in another body or form: to embody again in flesh.

I am sure that if I did not have some independent notion of reincarnation, for which I could make reference to beliefs about a "soul" (a term requiring its own external framework) that originally inhabited one body leaving that body at death, I could not have imagined the conditions under which something can get "embodied again in flesh", and I don't think that looking up the words **embody** or **flesh** in that same dictionary would have been able to help me.

My fascination with this terminology is because this is an area in which it is important to keep track of the difference between what a word means and the fact that the word is a part of a large and complex package of beliefs. This task of maintaining this separation is difficult because there is no convenient mechanism for doing this. If labels like *Theology* and *Hinduism* were consistently used, and definition–internal hedges about beliefs were avoided, the problem could be partly solved; but such labels generally represent categories that are too broad for the meaning to be properly anchored in its own proper belief system.

A Frame–Informed Dictionary

I believe that a dictionary should make it easy for the reader to know what background frames motivate the category a given word represents. In the case of scientific and technical vocabulary, this may not seem like a problem, since the people who use terminological dictionaries presumably are already trained in the basics of the relevant discipline. In the case of the most general vocabulary, this is not seen as a problem, since everybody who uses the dictionary already has access to the relevant frames.

However, we are not only interested in practical dictionaries and everyday users. If we return to the interests of the NLP researcher, we can remind ourselves once again that a computer needs to be provided with the frames that the rest of us already possess, and so lexical information that anchored a text in a conceptual structure that allowed precise inferences would have to be regarded as useful in systems seeking to achieve some level of automatic language understanding. The concept of "frame" has long played an important role in NLP research.

But more than that, the frames that underlie word meanings should become the basis for the recognition of semantic relations among words, and among

word senses. The concept of antonym, for example, covers a very broad range of relations, and their nature can be clarified if the semantic frames the words are situated in are made clear. The gravity–sensitive frame within which **short** is distinguished from **tall** differs from the gravity–insensitive frame within which **short** is distinguished from **long**. The multidimensionality of the frame structure of some words becomes clear when we find that sometimes the opposite of **man** is **boy**, sometimes it's **woman**, and in the other sense of the word **man**, sometimes its opposite is **beast**, and sometimes it's **God**. We are all amused by the fact that speakers of English tell us that the opposite of **start** is **stop**, but the opposite of **stop** is **continue**, that the opposite of **require** is **forbid**, but the opposite of **forbid** is **permit**; but we need to be able to understand these mysteries by reminding ourselves that there are also many frames for the concept of opposition.

Linguists who work with semantic distinctive features have fun with such clusters as **receive from** & **give to**, **borrow from** & **lend to**, **buy from** & **sell to**, **rent from** & **rent to**. All of them have in common the understanding of a transfer of control of something from one person to another, and the members of each pair differ from each other in the selection of viewpoint in some sort of action schema. (Those with **from** focus on the the person who acquires control; those with **to** focus on the person who yields control.) Two of these pairs add an understanding of the temporariness of the transferred control: **rent from, rent to** and **borrow from, lend to**. Two of the pairs are associated with exchange of money: **rent from, rent to** and **buy from, sell to.** And associated with the pairs that involve an exchange for money, we have another pair, **pay** and **charge**, having to do with the transfer of money in the opposite direction. A clean balanced paradigmatic display of these words is possible with invented semantic features reflecting the notions I have just discussed, but what would be missing from such a display would be any representation of the underlying understandings which motivate the existence of such words, having to do with the institution of property ownership, the workings of a money economy, the nature of social contracts, etc. The system of concepts we need for the whole thing will also ake intelligible the reality that in a number of respects, in the case of one's home, the fact that – at least in America – many home–buyers do not expect to outlive the conditions of their home loan, and hence they do not quite own the houses that they live in, on the one hand, and legislation about renters' rights – this time, less so in America – make renting a home seem veyr much like owning a home.

A Martian may need the ethnographic underpinnings of these words in order to understand what they area about; but why should we be concerned with such matters? The lexicographer needs to be able to articulate such information to be able to display how these words are related to each other. By taking a frame–semantic perspective, we do not say that words are related to each other directly: they are related by the ways in which they separately index the same frame.

Words relating to the functioning of traffic signals require us to understand something about certain physical and institutional settings. Religious terms require us to understand something about belief systems. The language of buying and selling, paying and charging, require us to understand certain facts about property ownership, contracts, and a money economy. The language of location requires us to have control of fairly complex structures of three–dimensional space, various sorts of topological relations, and so on. But it's common to think that words that exist to name things in the world, things that simply exist on their own, like the so–called natural kinds, are of only trivial interest to the semanticist and hence to the lexicographer.

A few evenings ago, at the lecture which opened this conference, harsh words were directed at certain cognitivist approaches to linguistic semantics, and it's clear to me that the kind of ethnographic semantics I've spoken about this morning would also qualify as a target of such remarks. Perhaps a few words can be said about how a frame–semantic attitude would inform claims about words being the names of sets of things and the idea that the formulation of word meanings is mainly in the business of domain splitting, separating horses from non–horses. A listener to our keynote speaker, perhaps an uncooperative listener, might have ended up believing that knowing the word horse in English consists mainly in the ability, when thrown into the presence of a large mammal, to judge whether in that context the sentence "This is a horse" is true. An ethnographic semantic approach to the word **horse** would proceed along totally different lines. Somebody who understands the English word **horse** and its derivatives and collocates needs to know this word as situated within the vocabulary of the partly overlapping, partly separate domains of livestock, farming, ranching, sports, art, entertainment, warfare, the history of transportation, and, yes, the meat industry, where one finds elaborate terminological differences sensitive to the age, size, sex, sexual functioning, strength, docility, breeding, markings, etc., of horses. In many contexts provided by such domains, the question of whether such–and–such an animal is or is not classifiable as a horse is less important than knowing whether in that context the actual word **horse** would be more appropriate than one of its domain–specific variants or hyponyms – **nag, pony, mare, yearling, foal, colt, gelding, stallion, steed, stud, mount, charger, hack, mustang, sorrel, pinto, palomino,** and this is ignoring the compounds. An important part of understanding the meaning of a word is knowing its position in a terminological network and understanding the nature of its participation in given contrast sets, and an important part of knowing the vocabulary of a language is that of mastering its encoding function: what word would you use in such–and–such a context.

We can imagine an electronic lexical resource which links word definitions with information about frames, and we can imagine lexicography projects that are devoted to establishing these links by discovering the nature of the frames. Such projects, to the extent that they try to uncover the semantic frames underlying the general vocabulary, are not frivolously engaged in

designing a data–base for some eventual English–Martian dictionary, but are laying the groundwork for understanding the ways in which the words in our language are connected with each other, the ways in which semantic near–equivalences can differ from each other within and across languages, and the ways in which the vocabulary of a language is an index of the culture and experiences of its speakers. It will be hard work to prepare such a lexical resource, but if we work on it there's a chance that the grandchildren of some of the younger members of this audience will live long enough to see it happen. In the meantime we can learn a lot, I think, by trying to become clear about what we would expect of such a system, and

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