Introduction
For many ESL learners, English prepositions pose a perennial problem, partly because the same lexical item -- e.g., the word over -- can have a variety of functions (as preposition, noun, adverb, adjective and particle (in verb+particle constructions)) and meanings, and partly because of its diversity in collocational properties. With no generalizations emerging, a common learning strategy then has been to resort to rote memorization. This is obviously a most unsatisfactory situation.

Recent research in prototype theory (Rosch, 1988; Geeraerts, 1989) and its cognitive extensions (Lakoff, 1987; Langacker, 1987) has attempted a principled explanation of polysemy structures, which might provide an alternative perspective for language learners. Studies on spatial prepositions (Brugman, 1983; Hawkins, 1984), employing concepts like prototypical sense and meaning chains, have succeeded in uncovering motivation and order behind previously random-looking groupings of meanings. In addition, the postulation of image-schema transformations and conceptual metaphor mapping strategies sheds light on the mechanisms of meaning change and meaning extension (Lakoff, 1987).

The present paper begins by reviewing briefly some of the theoretical underpinnings of prototype theory. It then focuses its attention on Brugman and Lakoff's studies of the lexical item over, and concludes with a discussion of implications for ESL pedagogy.

Prototypical Sense
According to Geeraerts (1989), prototype theory “originated in the mid-1970s with Eleanor Rosch's research into the internal structure of categories” (p. 587). Geeraerts claims that the theory has caught the attention of linguists because the insights can be used to develop a model for dealing with such semantic phenomena as “the fuzzy boundaries of lexical categories, the existence of typicality scales for the members of a category, the flexible and dynamic nature of word meanings, the importance of metaphor and metonymy as the basis of that flexibility...” (Geeraerts, 1989, p. 590). In other words, the polyseemous properties of lexical items could be handled through the application of such insights.

A polyseemous item is one which has a number of distinct, yet related, senses. The question is: how can we delineate the relations that exist among these senses? One approach is to try to abstract from them some universal semantic primitives that are common to all, and then explain the residue. Hawkins (1984) calls this the Core Sense Approach, and describes the way it works thus: “First is the search for the core sense, then the entry of the core sense in the theoretical lexicon, culminating with the statement of context-sensitive rules for deriving divergent surface senses from the core sense” (p.182). There can be three difficulties with this approach, however. First, the core sense can be so general and abstract that it does not have any explanatory value. Second, the formulation of context-sensitive
derivational rules can be an ad hoc affair and create more needs for rote learning. And finally, in some cases, the core sense just cannot be established. (See the critical dissection of Bennett's, 1975, application of the core sense approach to the study of the word over in Hawkins, 1984.)

An alternative approach is to try to identify a prototypical sense, and then use a meaning chain analysis to capture the relations among the different senses. Geeraerts (1989) neatly summarizes four characteristics that are frequently associated with the concept of prototypicality:

a. Prototypical categories cannot be defined by means of a single set of criterial (necessary and sufficient) attributes....
b. Prototypical categories exhibit a family-resemblance structure, or more generally, their semantic structure takes the form of a radial set of clustered and overlapping meanings....
c. Prototypical categories exhibit degrees of category membership; not every member is equally representative for a category....
d. Prototypical categories are blurred at the edges.... (p. 593)

Though these assumptions are not without problems, they allow Brugman, for example, to develop a meaning chain analysis. Taylor (1988) explains how this meaning chain analysis works in this way, in relation to his study of English and Italian prepositions:

For each preposition, we recognize a central, or prototypical sense. The prototypical sense, rather than being highly general, may well profile a very specific configuration. Polysemy comes about when the preposition is used in a sense which is closely related to, but distinct from, the prototypical instance. For example: a condition which is essential might not be met; a feature which is optional to the prototype now assumes central importance, or vice versa; or some additional feature might be required. By the same process, this derived meaning may in turn give rise to a further extension, and so on. The various senses of the word thus radiate out from the central prototype, like the spokes of a wheel. Senses at the periphery might well have little in common, either with each other, or with the central senses; they are merely related by virtue of the intervening members of the meaning chain. (p. 301)

Figure 1
Meaning Chain Analysis (made-up example): The prototypical sense is enclosed in the box. In this instance, one can expect Meaning 15 to have virtually nothing in common with Meaning 7.
In Figure 1, the prototypical sense is enclosed in the box as Meaning 1. In this instance, one can expect Meaning 15 to have virtually nothing in common with Meaning 7. Lakoff (1987) adds, “The links are sometimes defined by shared properties, but frequently they are defined not by shared properties, but by transforms or by metaphors” (p. 435).

With this approach, the establishment of the prototypical categories can be regarded as an empirical problem. The real test for the value of the approach lies in the delineation of non-trivial relations among the different senses of the polysemous linguistic item. Brugman’s (1983) study of over provides a fitting starting point for an investigation into this issue.

**The Polysemous Over**

The following accounts draws heavily on Lakoff’s (1987) summary and discussion of Brugman’s (1983) study of over. The data to be accounted for there are:

1. The painting are over the mantle.
2. The plane is flying over the hill.
3. Sam is walking over the hill.
4. Sam lives over the hill.
5. The wall fell over.
6. Sam turned the page over.
7. Sam turned over.
8. She spread the tablecloth over the table.
9. The guards were posted all over the hill.
10. The play is over.
11. Do it over, but don’t overdo it.
12. Look over my corrections, and don’t overlook any of them.

The interesting thing to note here is that “the word over in these examples is in several grammatical categories, e.g., preposition, particle, adverb, prefix, etc.” (p. 419).

The function of a spatial preposition is to locate spatially one object with reference to another object. Following Langacker (1987), the object which is located is termed the trajector (TR) and the object which serves as a reference point the landmark (LM). The trajector’s orientation relative to the landmark can be affected by a number of parameters, including such contrasts as static/dynamic, contact/no contact, etc.

In the sentence The plane flew over, over is interpreted as having the Above-Across sense. The TR-LM relation is diagrammatically represented as follows:

**Figure 2**

Schema 1 for ‘over’ (Figure reproduced from Lakoff (1987, p.419))
In this instance, the TR is dynamic, and there is no contact between the TR and the LM.

This figure is an abstract image schema that, according to Lakoff (1987) “cannot itself be imaged concretely, but which structures images” (p. 420). There can be variations of this when additional information is available. Hence, for the sentence The plane flew over the hill, the following is obtained:

**Figure 3**
Schema 1.VX.NC
(Figure reproduced from Lakoff (1987, p.421))

- VX = vertical & extended
- NC = no contact

Thus, by manipulating a few parameters, more specific image schemas can be created from the original one to help in the interpretation of sentences involving *over*.

There is a second, stative sense for *over*: the Above sense, as illustrated in Hang the painting over the fireplace. In this case, the Across sense is missing, and it does not allow contact between the TR and the LM. Schema 2 can be modified, as seen in the sentence The power line stretches over the yard.

A third sense is the Covering sense. Schema 3, which can be seen as a variation of Schema 2, requires that the TR must be at least two-dimensional, and can allow contact. Examples are:

**Figure 4**
Schema 3 (Figure reproduced from Lakoff (1987, p.427))

The board is over the hole.
One variation of this involves the use of a quantifier with the word *over* as in *The guards were posted all over the hill*:

Then there are the Reflexive schemas as exemplified in *Roll the log over*:

In this case, a part of the log can be seen as moving above and across the rest, i.e., part of the log acts as the LM, and the other part the TR.
When *over* functions as a prefix, it has the Excess sense, as seen in *The bathtub overflowed*. The side of the bathtub is interpreted as the LM, the P(ath) is the path of flow, and the TR is the level of the fluid.

The sixth sense of *over* can be described as Repetition. In *Do it over*, *over* is used as an adverb. This schema can be seen as a metaphorical variation of Schema 1: the P is understood as the course of the activity, and the LM as an earlier completed performance of the activity.

Lastly, *over* can also be used with a metaphorical sense in a variety of context. According to Lakoff (1987): “It is extremely common for metaphors to take image schemas as their input. A great many metaphorical models use a spatial domain as their source domain” (p. 435). To take an example, with the sentence, *She has a strange power over me*, reference is made to Schema 2 and to a very common metaphor: CONTROL IS UP; LACK OF CONTROL IS DOWN (discussed in Lakoff and Johnson, 1980, p. 15). A slightly more complicated example has to do with the sentence, *We need to find someone who can oversee this operation*. Lakoff (1987) explains this case as follows:

*The over in oversee is based on Schema 2, in which the TR is above the LM. There are a metaphor and a metonymy that are relevant to this example. The metaphor is CONTROL IS UP. Thus, the one who does the overseeing has control over the persons overseen. The metonymy is SEEING SOMETHING DONE STANDS FOR MAKING SURE THAT IT IS DONE. This metonymy is based on an idealized model in which making sure of something typically involves seeing it. Because of this metonymic relation, Seeing that he gets his money means making sure that he gets his money. Thus, to oversee means to be in control and make sure that something is done.* (p. 437)

The same kind of analysis can be applied to interpret some idiomatic expressions involving *over*, e.g. *Pete Rose is over the hill*. By referring to a variation of Schema 1 and the metaphor that views a person’s career as a journey over a vertical extended LM like a hill, one can infer that *over the hill* means the person has reached and passed the high point of his career.

To summarize, Lakoff observes six basic schemas associated with the different senses of *over*:

(a) Above-Across  
(b) Above  
(c) Covering  
(d) Reflexive  
(e) Excess  
(f) Repetition

Each can be elaborated on to form subschemas, and these subschemas are related through reference to the variation of a few parameters. Similarly, the schemas are linked in what is called the ‘family resemblances’ manner. Furthermore, some of these schemas and subschemas can be extended through the conjunction with certain metaphors and/or metonyms.

What do all these analyses add up to? Lakoff (1987) concludes: *We are not explaining why oversee, overlook, and look over mean what they mean. Their meanings cannot be predicted from the meanings of over, look, and see. But their meanings are not completely*
arbitrary. Given the range of spatial meanings of over and given the metaphors present in the conceptual system that English is based on, it makes senses for these words to have these meanings. We are explaining just why it makes sense and what kind of sense it makes. (p. 438)

Pedagogical Implications

Brugman and Lakoff's work has attempted to explicate the structure of the highly polysemous lexical item over. To language teachers, such linguistically significant generalizations are obviously useful, as Lakoff (1987) explains: "The psychological claim being made here is that it is easier to learn, remember, and use such assemblies which use existing patterns than it is to learn, remember, and use words whose meaning is not consistent with existing patterns" (p. 438). The next question, then, is how to translate this information into actual teaching and learning practices. The following points represent some tentative views on the issue.

(1) If one sees preposition learning as an instance of vocabulary learning, then students could benefit by being oriented to the meaning chain analysis. Recent research into vocabulary learning (Carter, 1987) has pointed to the benefits to be gained by situating lexical items in a kind of semantic network where the links may be explained in terms of such sense relations as synonymy or antonymy (and an even finer analysis for a group of synonyms). A new lexical item is never learned alone, but is immediately integrated in a network of learned items. In the language classroom, this means that the teacher and/or the learner should always be ready to activate such existing networks when a new lexical item or a new sense of a learned item appears. For those learners who keep a notebook of new vocabulary, they may need to develop new, personal, diagrammatic ways of capturing such meaning chains.

(2) It can be argued that people do the networking anyway, though on a subconscious level. It seems unlikely that the debate concerning the value of grammar instruction will be settled in the near future, but recent interest in the role of grammar teaching (Rutherford, 1987) and cognitive learning strategies (O'Malley and Chamot, 1990) in second language teaching and learning suggest that analytic discussion may have something positive to offer. In the classroom, the discussion can focus on the different senses of prepositions, as well as the links that exist among the various senses. Two suggestions follow from this insight:

(2.1) It is natural to present the uses of spatial prepositions using line figures or three-dimensional objects. The image schemas that Lakoff has developed represent one such attempt. By manipulating a few parameters, he has been able to create a variety of simple yet informative figures which could have a strong visual impact on learners. Of course, rather than remaining passively on the receiving end, the learners could be induced to draw their own figures in response to the stimulus sentences and to compare them. Furthermore, the classroom discussion can be focused on the parameters that have been varied. That such classroom use is of value underscores the fact that the parameters represent spatial orientations that are common in human experience, and not some strange artifices invented ad hoc by the theory.

(2.2) A most interesting thing concerning the system of links is the role of metaphors in the extension of their senses. The process of metaphorical conceptual mapping exists independently
of the senses of the preposition over, and is used in many other contexts. Low (1988) in fact argues that metaphor should occupy a more important place in language teaching because “it is central to the use of language” and because “from a structural point of view it pervades large parts of the language system” (p. 125). The idea of metaphor can be introduced not only in the literature or rhetoric classroom, or reading instruction, but also across the curriculum: e.g., many theoretical abstractions in the physical sciences can only be talked about through the use of certain metaphors. Also, many metaphorical usages are so common (the back of the chair) that most people would not even realize that they are metaphorical extensions -- in this case, of a human attribute to an inanimate object. Thus, the point here is that learners may in fact have easy access to a fund of knowledge concerning metaphors that needs only to be consciously exploited. There is, of course, one important caveat in this: for second language learners, the metaphors that are present in the conceptual system of their native languages may differ from those present in English.

(3) In the Core Sense approach, the responsibility is on the contextual cues to explain the derivational variations. The fact that the focus is primarily on the core sense, learners may sometimes develop a false confidence in their knowledge of the senses of a lexical item: getting the core sense is enough. With the prototype approach, they are dealing with more concrete configurations and are constantly reminded of the links. Moreover, the relation between the prototypical sense and a variation of it can be indirect, mediated by other in-between senses.

(4) Motivated explanation may be given of differences between prepositions - e.g., between over and above - by reference to the differences in the image schema and the metaphorical conceptual mapping. Taylor (1989) sees covering (the Covering Sense of over) as a special instance of influencing, and thus explains why the sentence Pull the lamp down over the table is possible, but not Pull the lamp down above the table’ (p. 113).

(5) The same kind of analysis can be, and has been, applied to other polysemous items, e.g., verb + particle constructions with up and out by Lindner (1983), modality by Sweetser (1984), and simple present tense by Leung (1990). It may be that the procedures have much wider application to a range of linguistic phenomena.

Conclusion
Research in cognitive linguistics has shown that it is possible to arrive at linguistically significant generalizations regarding the senses of polysemous items, e.g., with the word over. However, the most interesting thing about the prototype approach is not the capturing of the prototypical sense of a polysemous item, rather it is its concern to specify the nature of the semantic links by referring not to a linguistic metalanguage, but to common, everyday cognitive conceptualizations of the objects and phenomena in the world and their interrelationships. It seems metaphor has an important role to play in helping people to make sense of the world, and the study of metaphorical mode of thought may lead to the use of interpretative processes that belong to the greater domain of human cognition, which is cross-disciplinary and more general. Obviously, learners can benefit from a broadening of perspective -- the study of polysemy needs not be restricted to a purely semantic treatment. Given the exposure to the motivation that underlies semantic relations, learners may find that there is still order in the things of the world, be they only the polysemous English prepositions.
References


