Applying Cognitive Linguistics to Pedagogical Grammar: The Case of *Over*

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1. Introduction

Language learning is one of the most complicated feats that human beings accomplish. Any number of very real reasons exist as to why L2 learning presents tremendous challenges. However, instructed L2 learning has been further complicated by the fact that important elements of systematicity that exist in language have not been appropriately captured by the pedagogical grammars which underlie modern foreign language teaching textbooks and materials. For instance, lexical classes, such as English prepositions, are represented in the grammars (and the textbooks based on them) in piecemeal fashion. When students (and their teachers) encounter varying uses of these forms, the systematic relations between the multiple uses remain unexplained. For example, traditional analyses have not offered any explanations for why the four different meanings found in the sentences in (1a-d) are all associated with the form *over:*

(1) a *The picture is over the mantle*
b *The teller at the central bank switched the account over to a local branch*
c *The film is over*
d *Arlington is over the river from Georgetown*

In sentence (1a) *over* is interpreted as roughly 'located higher than'; in sentence (1b) *over* is interpreted as roughly 'transferred'; in sentence (1c) *over* is interpreted as roughly 'completed or finished'; and in sentence (1d) *over* is interpreted as roughly 'on the other side of'. Such varying meanings are typically presented, if they are addressed at all, as an unorganized list of unrelated meanings that are accidentally coded by the same phonological form. This results in a fragmented picture of the lexical class, leaving the learner with the impression that the various uses are arbitrary. Indeed, learners of English as a second language and many teachers of ESL have noted that acquiring the semantics of English prepositions is very difficult (e.g., Celce-Murcia & Larson-Freeman, 1998). In spite of the recognized difficulty,

a survey of ten currently used English Language Teaching (ELT) textbook series found that none even discuss this issue.

In the last 20 years, a new paradigm in linguistics, Cognitive Linguistics (CL), has revealed that much that has been deemed idiosyncratic and arbitrary under the traditional view of language is, in fact, systematic. CL provides a unified, accessible account of how many grammatical constructions and lexical items work, and how varying uses of these forms are systematically related to one another. Because CL adopts a usage-based approach to language, it is mindful of the contexts in which lexical items and grammatical constructions occur. Context-based analyses have revealed that speaker choice of a grammatical construction, such as passive rather than active, is meaning based. This insight is coherent with the basic CL tenet that syntax and morphology are meaningful and governed by many of the same cognitive principles as lexis. For the teacher, this approach has the potential to provide rich insights into the organization of and motivation for the core and "exceptional" uses associated with aspects of lexis and grammar. Ultimately, these insights offer language learners a more coherent and explanatory description of the language. In this paper, we illustrate the usefulness to language teaching of taking a CL approach through a brief examination of the semantics of the English preposition *over.*

Traditional accounts have represented the semantics of English prepositions as highly arbitrary (e.g., Bloomfield, 1933; Chomsky, 1995; Frank, 1972). However, a number of cognitive linguists, such as Brugman (1988), Dirven (1993), Kreitzer (1997), Lakoff (1987), and Lindner (1981) have argued that a good deal more systematicity exists in the semantics of English prepositions than has traditionally been assumed. Following up on that earlier CL work and incorporating recent refinements in cognitive metaphor theory (e.g., experiential correlation, Grady, 1999), Tyler & Evans (2001, 2003) have argued that many of the multiple uses associated with a preposition, such as *over,* are related in relatively straightforward, systematic ways. Tyler & Evans (2001, 2003) demonstrate that by following a few basic assumptions about the nature of language and applying a highly constrained set of cognitive principles, a more systematic picture of the semantics of English prepositions emerges.

The purpose of the present paper is to demonstrate the insights into the semantics of English prepositions that arise from this model, and to illustrate how these insights might be applied in the language classroom. Because of space limitations, this paper presents only the outlines of the model as illustrated through an analysis of a limited number of the meanings regularly associated with the preposition *over*.[1]

2. The Outline of the Model

The basics of the model include three fundamental assumptions about human language, a schematic representation of the central sense associated with the preposition, and a limited set of cognitive principles.

2.1. Basic Assumptions

We start by considering three fundamental assumptions upon which the model rests.

2.1.1. The Principled Polysemy Network

Our first basic assumption is that the multiple meanings associated with each preposition form a principled polysemy network organized around a central sense, rather than a list of unrelated meanings. Two lines of argumentation support this assumption.

First, work in experimental psychology (e.g., Rosch, 1975) has established that humans organize their mental representations of categories around a central exemplar that can be represented at various levels of abstraction or generality (Johnson-Laird, 1983). Cognitive linguists (e.g., Dewell, 1994; Langacker, 1987, 1991, 1992; Lakoff, 1987; Lakoff and Johnson, 1999; Taylor, 1995; and Vandeloise, 1991) have extended this understanding of the general organization of human cognition to the mental lexicon. Their work offers strong evidence that the mental lexicon is not organized like a dictionary in which each meaning associated with the same phonological form represents an unrelated word. Rather, lexical items are better understood as forming natural categories that participate in organized semantic networks, or polysemy networks, organized around a central sense. Work in psycholinguistics (e.g., Sandra and Rice, 1995) offers empirical support for this position.

The second line of argumentation in support of polysemy networks represents the view that the basic purpose for humans using language with each other is communicative in nature. As a result, in naturally occurring communicative events, lexical items occur in sentential context, not in isolated, citation form. Assuming that a lexical item is initially used to indicate one established meaning, we posit that a speaker attempting to communicate with a listener would use that lexical item to mean something new or different

from the established meaning only if they believed the listener had a reasonable chance of understanding the new meaning. This understanding presumably would come from inferences arising from the situated or contextualized use of the lexical item as it occurs in the ongoing discourse. This suggests that the additional meanings that have come to be associated with *over* originally arose from situated uses and the inferences that were derivable from context. With repetition across a number of similar contexts, the inferences come to be independently associated with the lexical form as additional senses; following Traugott (1989) we term this process of extending meaning *pragmatic strengthening*.

To summarize, our first assumption is that the multiple meanings associated with a preposition are not accidental, but rather that they are related to each other in systematic ways represented by an organized semantic network.

2.1.2. The Non-propositional Nature of Concepts

We next turn to our second assumption, which concerns the non-propositional nature of concepts. Cognitive linguists argue that 1) human conceptual structure is crucially shaped by our human perceptions of and interactions with the real world, i.e., the external physical-social world, and 2) language is a reflection of human cognitive structure. Concepts deriving from human interaction with the spatio-physical world, such as the spatial relations coded by prepositions, are better represented as being more gestaltlike and schematic in nature, often crucially involving sensory-motor imagery, rather than as linguistic propositions or semantic feature bundles (e.g., Johnson, 1987; Kosslyn, 1980; Langacker, 1987).[2] Mandler (1988, 1992, 1996) argues that beginning at a very young age, through a process of reanalysis of perceptual information, humans create mental representations of their recurring sensory-motor experiences with the spatio-physical world. These conceptualizations involve *spatial scenes,* or highly abstract, schematic generalizations established in memory in response to observing or experiencing physical entities in a number of similar events or similar spatial relationships.

Since it is highly unlikely that our perceptions of entities and events in the real world are interpreted in terms of bundles of linguistic propositions or semantic features, it is also unlikely that our sensory-based conceptualizations are represented in memory in terms of linguistic propositions or semantic feature bundles (Mandler, 1988; 1992; 1996). For instance, when one encounters the lexical item *bird*, the mental representation prompted for is probably not [+feathers, +wings, +sits on a nest, etc.], but something based

on sensory-motor imagery, which is more holistic in nature. As Langacker (1987) notes, it is virtually uncontestable that our understanding or conceptualization of objects involves imagery concerning their shape. Similarly, we believe that the conceptualized spatial relations coded by prepositions, and the situations or spatial scenes in which they are involved, are not likely to be represented by linguistic propositions and semantic features.

Because the spatial relations coded for by prepositions have their origins in our experiences with the spatio-physical world, particularly visual experiences, we represent them here through diagrams. However, we want to emphasize that by utilizing such diagrams we are not making any serious claim as to how these concepts are actually represented in the human conceptual system; they are simply attempts at characterizing the information associated with prepositions and the utterances in which they occur, in non-propositional terms.

2.1.3. Language Radically Underdetermines the Interpretation of Utterances

We now turn to our third assumption. Interpretation of an utterance is always richer than the content supplied by lexical items and the syntactic configurations in which they appear (Green, 1989; Grice, 1975; Langacker, 1987; Sperber & Wilson, 1986). Interpretation of utterances inevitably involves inferencing and background knowledge. Moreover, in line with our assumption of the non-propositional nature of meaning, we assume that linguistic utterances that refer to actions or events in the spatio-physical world prompt for gestaltlike conceptualizations of situations or scenes rather than a series of discrete dictionary-type definitions strung together (Langacker, 1987).

3. Illustrating the Model

Now let us turn to a consideration of how these assumptions influence our representation of the central sense of a preposition.

3.1. The Central Sense for *Over*

We propose that prepositions code for conceptual spatial relations between two entities, one in focus and one in background. Following Langacker (1987), we will call the focus element the *Trajector* (TR) and the back-

ground element the *Landmark* (LM). We take this basic spatial relation associated with each preposition as the central sense from which the various additional meanings have ultimately been derived.

Conceptual content can be abstracted away from recurring spatial scenes, giving rise to a highly abstract and schematized representation, which we term a *proto-scene*. A proto-scene can be equated with the primary meaning associated with a particular preposition, and thus includes information relating to the TR and LM, as well as the spatial relation mediating the two. As proto-scenes are idealized, they do not contain detailed information about the nature of either the TR or the LM, nor detailed metric information concerning notions such as the exact shape of the LM or the degree of contact between the TR and LM.[3]

3.2 The Proto-Scene for *Over*

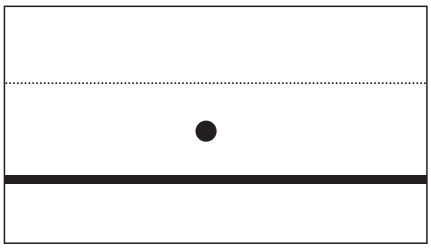

Figure 1. The proto-scene for over

Figure 1 represents the proto-scene denoted by the English preposition *over*. In figure 1 the dark sphere represents the Trajector (TR); the Landmark (LM) is represented by a bold line. The dotted line indicates that the TR is construed as being within potential reach of or being conceptually proximal to the LM.[4] The notion of the TR being within potential reach of the LM represents a functional element which appears to be an important aspect of the information denoted by each preposition. The functional element arises as a consequence of the spatio-configurational properties associated with a particular preposition (cf. Tyler & Evans, 2001; 2003: chapter 7; Vandeloise, 1994). Another way to articulate the functional relation denoted by *over* is to say that the TR and LM are within each other's sphere of influence, a consequence of the TR being in a region conceived as proximal to the LM (Dewell, 1994). In many scenes in which the configuration between the TR and the LM is denoted by *over*, the influence of the LM on the TR is in the

form of the LM acting as a (potential) obstacle to the forward movement of the TR.[5]

3.3. The Cognitive Principles

We noted earlier that in naturally occurring discourse, lexical items always occur in context. In addition, we noted that work in pragmatics (e.g., Green, 1989; Grice, 1975) has established that interpretation of any utterance inevitably involves inferencing. Therefore, in addition to representing prepositions as non-propositional conceptualizations of spatial scenes, our model also posits a limited set of cognitive principles that constrain and guide the inferences which arise during the normal interpretation of utterances. These include a number of inferencing strategies, and ways of viewing a scene (Langacker, 1987, 1992).

3.3.1. Inferencing Strategies: Real World Force Dynamics

In our full model presented in Tyler and Evans (2001; cf. Tyler and Evans 2003), we introduce several inferencing strategies. For present purposes we will discuss only one.

As a default, speakers assume that all elements in a conceptual spatial scene are subject to real-world force dynamics (Talmy, 1988, 2000). Vandeloise (1991) discusses this in terms of a naïve theory of physics that applies to how humans conceptualize spatial relations and how they use language to express those conceptualizations. In other words, as listeners are interpreting utterances, they assume the objects being discussed are subject to force dynamics such as gravity.

3.3.2. Ways of Viewing a Scene

In addition to the various inferencing strategies which guide situated interpretation, spatial scenes are conceptualized from a particular vantage point. The conceptualizer represents the default vantage point and is usually "offstage". However, any spatial scene can potentially be viewed from a variety of vantage points. Langacker (1987, 1991a, 1992) argues that: "Grammar (like the lexicon) … structures a scene in a particular way for purposes of linguistic expression, emphasizing certain facets of it…, viewing it from a

certain perspective…" (1987: 39). That is, the physical vantage point on a spatial scene will determine how we conceptualize that scene, and no two vantage points offer the same view. Hence, as the vantage point changes, the exact interpretation of the scene changes.

Consider the following example. In a scene in which a large cloth is positioned in relation to a table so that the cloth covers the top of the table, the scene can be construed by focusing on contact between the cloth and the table. In this case, the scene is likely to be coded in English by the sentence: *The tablecloth is on the table*. Alternatively, the relationship between the cloth and the table can be viewed as the cloth hiding or obscuring the table from the observer's view. In this case, the scene might be coded as: *The cloth is over the table*. A less typical, but perfectly acceptable view would be to place the table in focus, in which case the coding would be something like: *The table is under the tablecloth*. Hence, the same basic scene affords several distinct ways of being viewed and interpreted.

Although this example involves changes in lexical items in order to signal a change in vantage point, shifts in vantage point are not necessarily coded by changes in lexical items. We will see several examples of this in the following section.

4. Extending Meaning Beyond the Proto-scene

Now we turn to a consideration of how the proto-scene associated with *over,* in conjunction with our basic assumptions and our cognitive principles, can account for how several, distinct meanings came to be associated with the preposition *over*. To illustrate, consider the interpretation of the very straightforward sentence: *The cat jumped over the wall.*

4.1. Overview

If we limit ourselves to only the information provided by the lexical items, we know that in general there is an entity, a *cat*, involved in a particular kind of motion, *jumping*, and at some point in this motion the cat was located higher than a particular landmark, a *wall*. More specifically, we know: 1) The lexical item *jumped* specifies a motion of pushing off from a solid surface; we can interpret *jumped* as including information about the starting point of the cat's motion; 2) The lexical item j*umped* also adds the information that the cat used enough force to propel itself off the ground,

thus creating momentum; and 3) The preposition o*ver* prompts for a particular conceptualized spatial relation between the TR (*the cat)* and the LM (*the wall,* which is understood as a barrier which the cat must overcome if its forward motion is to continue),[6] as depicted in the proto-scene in figure 1. When interpreted within the context of the sentence, it tells us that at some point in its jump, the cat was located higher than the wall.

The diagram in figure 2 captures the conceptualization that might arise if the interpretation of the utterance were based solely on the information provided by the lexical items.

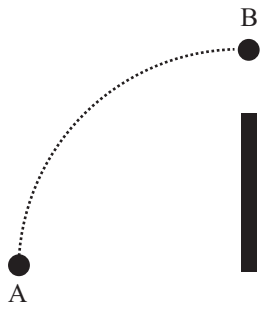

Figure 2. Schematization of a literal interpretation, i.e., one involving no inferences, of sentences of the type: The cat jumped over the wall

In this conceptualized spatial scene, the beginning of the motion coded by *jump* is represented as point A, the information coded by *over* is represented as point B. Notice the LM (*the wall*) is represented by a vertical line. Finally, the dashed arc represents the trajectory the cat followed to move from the starting point of its jump to the position denoted by *over the wall*.

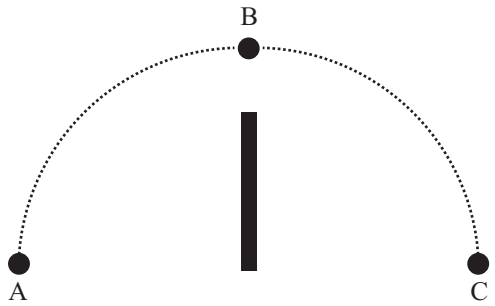

Figure 3. Schematization of normal interpretation, i.e., one involving inferences, of sentences of the type: The cat jumped over the wall

Clearly, this is not the normal understanding of the full motion the cat would be expected to engage in when we interpret the sentence. Rather, native speakers normally interpret the sentence to mean something like the cat followed a trajectory that approximates the diagram in figure 3, in which the cat comes back down to earth, ending its jump at approximately point C.

What we want to emphasize is that nothing in the linguistic information provided in the sentence *The cat jumped over the wall* specifically codes point C. In other words, point C is inferred. The question is how this inference arises.

We argue that the interpretation of this utterance, including the inference of point C, comes from integrating our knowledge of: 1) the real world (for instance, our knowledge of the action of jumping which involves an animate entity creating enough momentum to push itself off the ground and propel itself to a position higher than the wall, and our knowledge of cats – that they cannot stay suspended indefinitely in space the way, say, a hummingbird can; 2) the key spatial configuration between the TR and LM coded by *over* which tells us that at some point in its movement, the cat was positioned higher than the wall and that the wall represents a potential obstacle to the cat's forward motion; and 3) the force dynamics of gravity and momentum which tell us that the cat, having reached point B, must come back to earth, point C. Thus we argue that full interpretation of the sentence *The cat jumped over the wall* crucially involves the inference that the cat ends its jump at point C.

Furthermore, we propose that repeated observations of entities engaging in similar motion (i.e., motion that involves the entity pushing off from a starting point, reaching a point in its movement in which it is located higher than a LM, and then returning to ground at point C) and exposure to utterances which prompt for conceptualizations of entities involved in such motion (for instance, *The girl stepped over the branch in the path, The rabbit hopped over the stone, The horse jumped over the fence)* result in a highly abstract schematization being established in memory. The diagram in figure 3, which we call the A-B-C trajectory, constitutes an attempt to represent this schematization.

We hypothesize that repeated encounters with utterances involving a particular preposition, here *over*, and a particular inference, that the motion that the TR engages in involves point *C*, can result in the inference itself becoming a distinct meaning associated with the lexical item or can give rise to secondary inferences which become distinct meanings associated with the preposition (Traugott, 1989).

4.2. Inferences associated with the A-B-C trajectory and establishment of extended meanings

In essence, we are arguing that the inevitable inferences that occur as a part of normal, everyday interpretations of prepositions, as they occur in sentential contexts, provide a powerful mechanism for extending the meanings associated with a preposition. To illustrate this point, we will consider three distinct meanings associated with *over,* which appear to arise from natural inferences that result from interpreting sentences which involve an A-B-C trajectory. We saw these three distinct meanings – transfer, completion, and on-the-other-side – illustrated at the beginning of the paper. They are repeated again in the examples in 2–4. The diagrams in figures 4–6 are meant to represent the schematized spatial scene that is prompted for by each of these distinct senses associated with *over.* In each case, they ultimately arise from the inference of C in the A–B–C trajectory, but have been changed in particular ways in line with the two cognitive principles discussed previously. The diagrams in figures 4–6 do not look exactly like the diagram of the A-B-C trajectory in figure 3. Each diagram in figures 4–6 reflects some change or addition to the original spatial scene which is important in the ultimate establishment of the distinct meanings associated with *over*.

A key point we will attempt to convey is that at first glance, and if we only attend to propositional definitions, there appears to be little relation among the three meanings: transfer, completion, and on-the-other-side. However, if we focus on the spatial scene prompted for by the preposition as it occurs within sentential context and on the inferences that inevitably arise during everyday interpretation of utterances, systematic relations among these distinct interpretations reveal themselves. With all three of these distinct meanings, the original spatial configuration of the TR being higher than the LM is no longer active. The crucial point we are making is that the inference of C arose from interpreting a sentence that *does* involve the proto-scene.

4.2.1. The Transfer Sense

Recall sentence (1b) reproduced below as (2):

(2) *The teller at the central bank switched the account over to a local branch.*

In this sentence, *over* has a meaning approximately equivalent to 'transfer'. We suggest that this meaning has arisen because often when an object moves from point A to point C, and there is a potential recipient located at point C, then transfer of the object occurs. The notion of transfer is particularly salient in a sentence such as: *Andre Agassi hit the ball over the net to Pete Sampras.* We believe that after a speaker encounters several sentences such as this one, which involves the interpretation that the movement of an object through the A-B-C trajectory results in a transfer of the entity from point A to point C, that the distinct meaning of transfer is added to the semantic network.

The diagram in figure 4 characterizes the spatial scene prompted for by sentences of this kind:

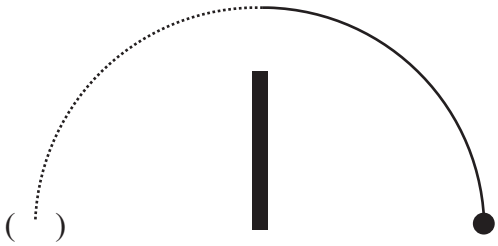

Figure 4. Transfer sense: The TR has been transferred from the left side of the impediment to the right side, as represented by the dark sphere which is in focus.

The TR has been transferred from point A to point C, as represented by the sphere, which is highlighted. Highlighting is one of the changes in vantage point that has been identified in the CL literature (Langacker, 1992). As we noted in our earlier discussion, whenever there is a shift in vantage point, a shift in meaning is involved. Thus we argue that there are two sources for the addition of the extended meaning of transfer to the semantic network of *over* – the situated inference of the object ending up at point C and the shift in vantage point such that point C is highlighted.

4.2.2. The Completion Sense

The second distinct sense is illustrated in (1c) reproduced here as (3):

(3) *The film is over*

In this sentence, *over* is interpreted as something along the lines of 'complete' or 'finished'. We suggest that this distinct meaning arises from the inference

that when the TR lands at point C, the process the TR is involved in is completed. In our interpretation of *the film*, we understand that a process is completed, i.e., the viewing or showing of the *film* is completed.[7]

The diagram in figure 5 represents the conceptualized spatial scene prompted for by this utterance:

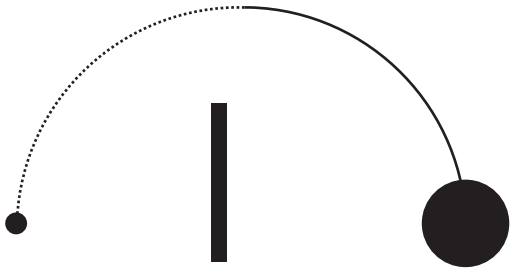

Figure 5. Completion sense: The dark sphere on the left represents the location of the TR at the beginning of the process. The large sphere on the right, which is in focus, represents the end-point or completion.

The sphere on the left represents the location of the TR at the beginning of the action or process. The large sphere on the right is highlighted and represents the location of the TR at the completion of the action or process. A key to this interpretation is that the end point of the trajectory is highlighted or given special focus. As we noted with the transfer sense, highlighting is one of the changes in vantage point that has been identified in the CL literature, hence establishment of the completion sense, with highlighting on point C, involves a change in vantage point from the original scene depicted by the A-B-C trajectory. As with all senses related to the A-B-C trajectory, point C is taken to arise from an inference involving our knowledge of force dynamics. Thus, we again see that the principle that a scene can be viewed from many vantages, in conjunction with background knowledge of force dynamics, combine to give rise to a new interpretation.

It is important to point out that in this use of *over* the focus is on point C, the point at which the action is completed. The spatial configuration associated with the central sense of *over* is no longer strictly associated with this sense. The location, point C, has been re-interpreted as providing information about the action or process, not the spatial relation between the TR and the ‡ing a process and as such is now acting as an adverb. Through repetition and entrenchment in memory – the process we are identifying as pragmatic strengthening – the repeated inference of “completion” has come to be independently associated with *over* as a distinct sense.

4.2.3. The On-the-other-side Sense

Now reconsider the sentence in (1d) reproduced below as (4):

(4) *Arlington is over the river from Georgetown.*

In this sentence, *over* provides the interpretation of 'on-the-other-side'. This distinct meaning appears to arise from the inference that when the TR moves through an A-B-C trajectory and ends at point C, it is located on the other side of the LM from where it originally started. The final, resultant location of a TR that has moved through an A-B-C trajectory has been reconceptualized as a stable locative state. Moreover, the interpretation seems to involve a shift in vantage point. Recall that in the proto-scene the vantage point of the conceptualizer is "off-stage" (Langacker, 1987). However, sentences such as *Arkansas is over the bridge* and (4), are only felicitous if the speaker/conceptualizer is understood to be at roughly point A in the A-B-C trajectory. Consider the following exchange:

(5) A: Where's Arlington from here?
B: It's just over the river.

This exchange would only be felicitous if the *Arlington* is on the opposite side of the river from where the interlocutors are located. Thus, the interpretation involves the interlocutors being located "on-stage", at point A.

The diagram in figure 6 represents the conceptualized spatial scene prompted by this sentence:

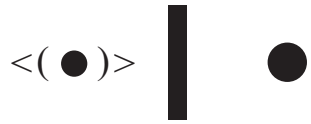

Figure 6. On-the-other-side-of sense: The eye icon on the left represents the vantage point, the vertical line the impediment and the dark sphere the TR.

The vertical line represents the LM. The shaded (and hence highlighted) sphere represents the TR, which is construed as being at the completion point of the action. The eye icon on the left represents the vantage point, which locates the conceptualizer as being onstage and represents a shift from the basic A-B-C schematization.

It is important to note that in our understanding of this sense, neither the central spatial configuration of one entity being located higher than another entity represented in the proto-scene associated with *over*, nor the action of moving from point A to point C is strictly associated or involved. The aspect of the scene that is receiving focus is the final spatial positioning of the TR. The meaning has come to be completely associated with the inferred point C. Again, we see that a shift in the way the scene is viewed gives rise to a distinct interpretation.

In sum, by assuming a non-propositional representation of the preposition, our proto-scene, in conjunction with clearly established principles such as inferencing and knowledge of gravity, we have a rather straightforward explanation of how these three seemingly unrelated meanings can be systematically related to *over*.

5. The Network of Senses Associated With *Over*

The diagram in figure 7 represents the polysemy network we have established for *over*. The network involves 14 senses, including the proto-scene. For each sense, by using a highly limited set of cognitive principles, we have been able to trace how the distinct meaning could arise from interpretation of the proto-scene associated with *over*. Moreover, we have been able to construct similar networks for 17 of the most commonly occurring English prepositions (cf. Tyler and Evans 2003).

Filled circles indicate a distinct sense in the network. Open circles indicate a spatial scene which gives rise to a cluster of senses.

The following are illustrative sentences for each of the 14 senses:

1. The picture is over the mantel.

2A. Arlington is over the river from Georgetown.

2B. Your article is over the page limit.

3. Joan nailed the board over the hole in the wall.

4. Frank looked over the train's undercarriage.

4A. The committee agonized over the decision.

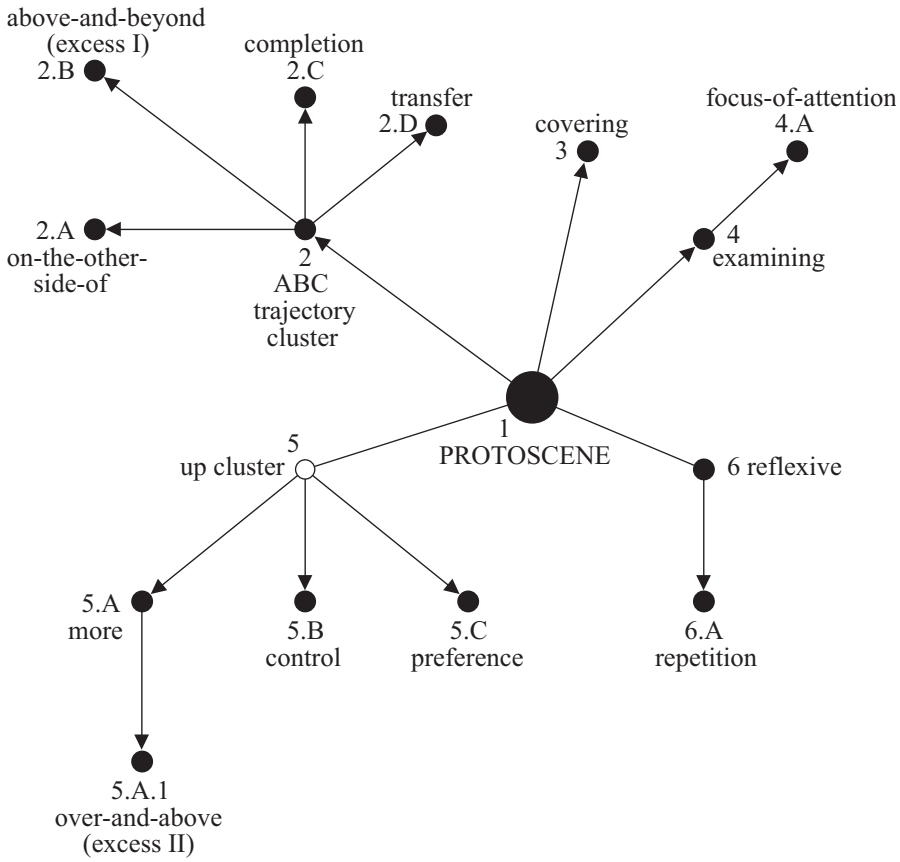

Figure 7. The semantic network for over.

5A. My mother never drives over the speed limit.

5A1. The child was overtired and so had difficulty falling asleep.

5B. My neighbor always has control over his pit bull.

5C. I prefer coffee over tea.

6. The fence fell over.

6A. Marty keeps making the same mistake over and over.

6. Applying the Model to the Classroom

We believe that the approach to prepositions we have outlined here has the potential to provide a number of benefits for the second language learner. First, the model represents the various, extended senses associated with *over* as being clearly motivated by a relatively small number of principles. Although we acknowledge that some uses of *over* (and other English prepositions) are bound to be idiosyncratic, especially, for instance, when they combine with verbs in verb-particle constructions, the amount of arbitrariness is significantly reduced under the current approach. Thus the model provides a more systematic, explanatory account of the semantics of English prepositions than traditional approaches, cutting down considerably on the amount of arbitrariness in the representation and hence reducing the need for rote learning on the part of the second language learner. Second, because the model draws heavily on the notion of the experiential basis of meaning and represents the extended senses as arising from observations of the external, spatio-physical world, it reflects the learners' own experiences with the world. Understanding the motivation behind the extended senses as experientially motivated and coherent with the learners' own observations of the world would seem to make these senses easier to acquire. Third, the various senses are represented as gestalt-like conceptualizations of situations or scenes which are systematically connected, rather than a series of discrete dictionary-type definitions strung together in a list. The systematic connections for *over* are modeled in the graphic representation of the network, as illustrated in figure 7. Such graphic representations of polysemy networks provide visual rubrics that may be useful presentational tools for the language teacher and useful aids for the second language learner. Finally, the constrained, principled nature of the model would seem to provide a solid foundation for the learners from which to infer the meanings of unfamiliar uses of *over* when they are encountered in context.

In the remainder of this section we offer a few suggestions concerning how the proto-scene and two of the extended senses might be taught. These ideas and materials have been piloted in a small, quasi-experimental classroom intervention (Winke & Kim, 2002). These lessons are aimed at intermediate-level English language learners who presumably have already been exposed to some version of the central sense of *over*. The teaching activities themselves and their sequencing are motivated by the model we have outlined. They draw on the notions that observations of the external, spatio-physical world provide cognitive framing for the internal, conceptual world and that cognitive representations of observations of events in the word involve a scene complete with participants engaged in the event.

1. Start by introducing a visual representation of the proto-scene and emphasizing the spatio-physical configuration between the TR and LM. (Much of this should be familiar, but the notion of the TR and LM being within each other's spheres of influence will be new.) Briefly show several pictures, accompanied by appropriate language, which illustrate the central use of *over*.
2. Move to scenes involving the A-B-C trajectory:
   a. The point to emphasize is that in this scene, *over* codes one crucial point in the overall movement, the point at which the TR is higher than but interacting in some way with the LM. Often the interaction involves the LM being an obstacle.
   b. Use a flip book which shows a cat jumping over a wall. Stop at the series of pictures in which the cat is at point A, then go to pictures where the cat is at point C. Ask how the cat got from point A to point C. Point out that the wall is an obstacle in the cat's forward motion. Next, stop at the series of points where the cat is best described as being *over* the wall. Note that there are many points in the entire event in which the cat is not *over* the wall, but that *over* picks out the key points which tell us that the cat jumped such that it was higher than the wall and within the wall's sphere of influence.
   c. Continue through the pictures. Emphasize the notion that the cat must land on the other side of the wall.
   d. Emphasize that because English speakers use *over* when they describe the scene involving movement from point A to B to C, a strong connection has developed between *over* and this entire A-B-C scene.

      – Alternatively, the points could be made with clips from movies or cartoons showing everyday actions which involve an object moving from one side of an obstacle to another. Using Power Point, freeze the frames which illustrate points A, B, and C (as in the discussion of the flip book).
3. Now move to the presentation of the Completion sense.
   a. Using flip book and/or video clips, stop at point C. Ask whether the 'jump' is completed. Has the cat finished jumping?
   b. Present a visual representation of the A-B-C trajectory with C highlighted. Emphasize the notion that everyday actions of moving from one side of an obstacle to the other side require the moving object to finish the action at point C and that since *over* is used in the description of this whole scene, it has developed the additional meaning of 'finished, completed'.

c. Give several examples, again using pictures, flip books, etc. E.g., 'The jump is over'.
d. Then explain that once *over* became associated with completion of physical movement, it could be extended to mean completion in general. Give several examples of non-physical uses such as 'Class is over'.

4. Move to the Transfer sense.
   a. Ask a student to come to the front of the room. Stand on one side of the desk (point A); ask the student to stand on the opposite side of the desk (point C). Throw some large, silly object (like a nerf ball) over the desk to the student. Repeat the throw, but before you throw the object ask, 'Who has the X?' Toss the object, when the student has caught the object ask, 'Now who has the X? How did the X get from me to student? I threw it OVER the desk. I tossed it OVER the desk.'
   b. Emphasize that: 1) because when an object moves from point A to point B to point C, the object is transferred from A to C; and, 2) because English speakers use *over* to describe the whole A-B-C scene, *over* has taken on the additional meaning of 'transfer'. Reinforce with several examples of physical transfer over an obstacle while introducing common phrases such as *hand over, pass over, toss over,* etc.
   c. Explain that once *over* was commonly used to describe transfer of physical objects, it was extended to indicate transfer in general: *sign over, turn over, win over, take over*, etc. E.g.,
      – *The Beatles immediately won the hearts of millions of teenagers.*
      – *The Beatles eventually won over the hearts of many of their parents as well. (Note how the use of over raises the implication of an obstacle that had to be overcome.)*
      – *After long debate, George Bush managed to win over many governments to his position on Iraq.*

7. Conclusion

We have analyzed the multiple senses associated with each English preposition as forming a polysemy network organized around a central sense, the proto-scene, which is made up of a TR and a LM in a specified spatial configuration and a functional element. Each proto-scene is understood to constitute the primary meaning representation associated with a particular preposition, from which additional meanings have been systematically derived. Thus, each preposition and the multiple uses associated with it are

represented as an organized, connected network of related meanings, rather than arbitrary lists of distinct meanings that happen to share the same phonological form.

We further argue that distinct, multiple senses can be accounted for by a highly limited set of pragmatic and cognitive principles. In this paper we have focused on the importance of non-spatial, extended meanings of the prepositions and the interpretations that arise from the preposition as it occurs in sentential context. In addition, we have considered the inferencing strategy of using real world force dynamics in interpreting prepositions in context; and we have examined the cognitive principle that a conceptual scene can be viewed from a number of vantage points and that each change in viewing can give rise to a change in interpretation of the scene. Inferences, which are an unavoidable aspect of sentential interpretation, in conjunction with shifts in vantage point, are argued to ultimately give rise to additional meanings in the semantic network associated with a preposition.

We believe that such an analysis has great potential in offering a more teachable account of the multiple interpretations assigned to each preposition. The suggested lesson illustrates how this understanding of prepositional meanings can be presented to L2 learners with a minimum of technical jargon or grammatical explanation. The language teacher, armed with the insights provided by this account, can provide more coherent, insightful explanations of the various meanings associated with English prepositions, and thus move beyond the instruction to simply commit the various meanings to memory.

Notes

1. In the full analysis of *over,* 14 senses are identified, (cf. Tyler and Evans, 2001). Moreover, we emphasize that the model is based on a thorough analysis of 17 of the most commonly occurring English prepositions (cf. Tyler & Evans, 2003).
2. Langacker (1987) argues "sensory imagery is a real phenomenon whose role in conceptual structure is substantial. We can plausibly suppose that a visual image (or a family of such images presupposing different orientations and levels of specificity) figures in our knowledge of the shape of an object; and certainly one aspect of our conception of a trumpet assumes the form of an auditory image representing the sound it makes" (pp. 111). He emphasizes that a commitment to the importance of sensory imagery in the shaping of conceptual structure does not imply a position that sensory imagery is an exclusive or essential facet of all meaning of linguistic expressions. Neither should sensory images be confused with the naïve view that a sensory or even a conceptual visual image is analogous to a photograph or a picture. As the experimental psychologist Kosslyn (1980) argues, "Image representations are like those that underlie the actual experience, but in the case of mental imagery these representations are retrieved or formed from memory, not from immediate sensory stimulation" (p. 18).
3. In our full model, the notion of a functional element plays a crucial role. We hypothesize that in addition to the spatial configuration between a TR and a LM, the concept prompted for by a preposition also involves a functional element (Tyler and Evans, 2003; Vandeloise, 1991). In the case of *in*, for example, the functional element involves the notion of containment. Johnson (1987), for instance, has argued that the functional element of containment includes location, confinement, protection, and potential obscuring of the element(s) being contained. For instance, if a young child is in a playroom, the caretaker knows where the child is located, the actions of the child are limited to those which can take place within the space of the playroom, the child is protected from certain outside threats (e.g., the hot stove in the kitchen), and, for the most part, the child is physically obscured from entities outside the playroom. The container and its interior region also form the physical environment, which surrounds the TR. In the case of the child in the playroom, the interior region of the room largely determines the temperature, lighting, ambient sounds, etc, in other words, the general physical environment which surrounds the child.

   Our analysis has revealed that the functional element is key to appropriately characterizing the distinction between the prepositions *over* and *above*. However, the points made in the present discussion do not crucially refer to the functional element.
4. The TR being potentially within reach of the LM allows *over* to depict spatio-physical configurations in which there is contact between the TR and the LM as well as those in which there is no contact. This is a crucial distinction between *over* and *above* (whose functional element is distal in nature). The difference in

the functional elements of *over* and *above* is illustrated in pairs of sentences such as:

a. Mary skated over the icy pond.
b. Mary skated above the icy pond.

The normal interpretation of sentence (a) is that there is contact between Mary (i.e., the skates she is wearing) and the icy pond. The interpretation of sentence (b), in contrast, does not allow for contact between the two. Mary might be skating on a stream that is located at some distance from the pond or she may have unearthly powers of levitation, but her skates are not understood to come into contact with the icy pond.

5. Representing prepositions as spatio-physical relations between two entities whose relationship involves a functional element is one of the important ways in which this model differs from Brugman (1980) and Lakoff. As mentioned in note 3, our representation of *over* differs crucially from that of *above.* Although our representation of the proto-scene for *over* strongly resembles that of *above*, it is misleading to "translate" the "meaning" of the protoscene for *over* with the 'above' sense, as Lakoff (1987) does. Such prepositional translating leads to the erroneous conclusion that using the verb *jump* plus the 'above' sense of *over* allows NSs of English to interpret the sentence *The cat jumped over the wall* as the cat landing on the top of the wall, or on a spot slightly higher than the wall. This is at odds with the interpretation normally assigned by native speakers.
6. Recall this notion of potential obstacle is a result of the functional element denoted by *over.*
7. Here *film* is actually a metonymy in which the name of the physical entity (the film or the movie) is understood as the process of showing the film.

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