

# **Rethinking English ‘Prepositions of Movement’**

## **The Case of *To* and *Through***

VYVYAN EVANS AND ANDREA TYLER  
*University of Sussex (UK) and Georgetown University (USA)*

In this paper, we argue against the view that prepositions designate motion. We make the case for prepositions such as *to* and *through* being associated with spatial properties in addition to a functional element. The functional element arises as a consequence of our daily interaction with the spatial configuration associated with the particular preposition. While *to* is associated with a spatial configuration in which a TR is oriented in the direction of a LM, its functional element is that of the LM constituting the TR’s goal. Due to the integration of spatial and functional elements with sentential context, particularly motion verbs, a movement reading is derived. Previous scholars have assumed this is due to the preposition itself. With regard to *through*, its semantics are associated with a spatial configuration involving contiguous locations from one side of a bounded LM to the other. The functional element is that of path, which, while correlating with motion, is distinct from it. The notion of motion which often arises in sentences involving *through* is due to the integration of the spatial and functional character of *through* with other sentential prompts for movement such as motion verbs. In essence, we argue for carefully articulating the nature of conventional content associated with prepositions, including both spatio-geometric and functional content, and for teasing apart distinct and distinguishable (albeit related) concepts such as orientation, path, trajectory, goal, and motion.

### **1. Introduction**

In their paper on distributed spatial semantics, Sinha and Kuteva (1995) argue that the situated interpretation of spatial particles, such as English prepositions, does not solely derive from the preposition itself. Rather, other form classes

which collocate with the preposition bear on its interpretation in context. For instance, consider the following noun phrases:

- (1) the fruit in the bowl
- (2) the crack in the bowl

What these examples illustrate is that a particular Trajector (TR) can, in conjunction with a particular Landmark (LM), affect the interpretation of a preposition.<sup>1</sup> On one hand, the interpretation ascribed to the phrase in (1) is that the LM, the bowl, contains or surrounds the TR, the fruit. On the other hand, in (2) the conventional interpretation is that the TR, the crack, constitutes a flaw which is part of the bowl. Additionally, the crack may either appear as part of the interior or exterior of the bowl. Language users do not normally derive an interpretation for (2) in which an entity identified as *the crack* is somehow located within the confines of the bowl, i.e., the interior space bounded by the bowl, in the same way that entities such as fruit can be. Clearly, our interpretation of the conceptual spatial relation denoted by a preposition such as *in* is in part constrained by sentential context, that is, by the characteristics of the actions or entities which are designated. A crack is a different kind of entity from fruit. In conceptual terms, a crack is inherently relational, requiring a LM of which it constitutes a subpart, while fruit is a conceptually distinct entity. The different status of these two items differentially affects the exact interpretation of the relationship designated by the preposition. In this way, the meaning assigned to the preposition is ‘distributed’ across the sentence.

Since Brugman and Lakoff’s work on the English preposition *over* (Lakoff 1987; Brugman 1988; Brugman and Lakoff 1988), it has been common in Cognitive Semantics to assume that the nature of spatial meaning is due to the contribution of distinct senses associated with a preposition, rather than allowing sentential context a significant role. For instance, consider the following sentences:

- (3) Sam climbed over the wall.
- (4) The bird flew over the wall.
- (5) Sam walked over the hill.

Lakoff (1987) analyzed these sentences as representing three distinct senses for *over*, i.e., as reflecting three distinct schematizations. These schematizations involve presence or absence of contact between the TR and LM, as in (3) and (4), or presence or absence of horizontal extension, as in (5) and (3)–(4). This

highly granular approach to lexical polysemy has been criticized for a number of reasons (see in particular Sandra 1998; Tyler and Evans 2001, 2003). Sinha and Kuteva observe that such 'full specification' approaches to spatial particles derive from the implicit assumption that "spatial relational meaning ... is carried by the locative particle, and only by the locative particle" (Sinha and Kuteva 1995: 167). That is, Lakoff and those following his analysis of *over* have failed to recognize that in examples such as these, the TR and/or LM are crucially contributing to the trajectory shape, while the verb contributes path information (a point that will be exemplified below). These arguments suggest that it may be erroneous to represent the preposition itself as conventionally contributing meaning at the level of specificity that has sometimes been claimed.

Of course, to suggest that the spatial meaning associated with prepositions is distributed over the utterance in which the form occurs does not entail that the preposition itself is devoid of meaning. On the contrary, prepositions do have conventional meanings associated with them, including a functional element (explicated below). However, the precise interpretation assigned to the prepositions is constrained and delimited by the sentential context, including the TR noun phrase, LM noun phrase, and verb which occur in the utterance.

Nowhere is this clearer than with the so-called 'prepositions of movement', which present an excellent 'laboratory' for studying what prepositions do conventionally provide in terms of information about a *spatial scene* (a conceptualized relation between a TR and a LM, e.g., *The cat is on the mat*), *complex conceptualizations* (spatial scenes involving dynamism, i.e., scenes which may evolve through conceived time, e.g., *The cat got up off the mat and walked towards its milk*—see Tyler and Evans 2001, 2003), and how the interpretation associated with a preposition is constrained and nuanced by other elements in the sentence.

In specific terms, we argue against the widespread assumption that many so-called 'dynamic' prepositions denote motion (e.g., contra Lakoff 1987; Brugman 1988; Brugman and Lakoff 1988; Kreitzer 1997). In particular, we suggest that such analyses have conflated the distinct concepts of motion, orientation, goal, trajectory, and path. A major goal of this paper is to tease apart these constructs. We argue that information relating to motion and trajectory is derived from the sentential context, typically from verbs, but in some cases from general pragmatics and our knowledge of the world (see section 2). In order to illustrate this, we provide an analysis of *to* and *through*, suggesting that while *to* codes for orientation and goal, but not path and

motion, *through* codes for path, but not goal, orientation, and motion (see sections 5 and 6).

The research presented in this paper is based on a model of word meaning termed *principled polysemy*, as outlined in Tyler and Evans (2001, 2003) and Evans and Tyler (2004), which presents a model of the polysemy exhibited by spatial particles. The analysis offers principled criteria for deducing the primary or central sense associated with a prepositional network of senses, as well as principled criteria for deducing what counts as a distinct sense. Accordingly, there are clear principles for deciding when a sense is instantiated in memory (conventionalized), and crucially when it is simply a contextualized usage, and hence results from distributed spatial semantics.<sup>2</sup>

## 2. Background: The case of *over*

As the English preposition *over* has been so extensively studied, it provides a useful point of departure for the perspective we will advance. It has often been suggested that certain prepositions encode ‘movement’. For instance, Lakoff (1987), following Brugman (1988) and Brugman and Lakoff (1988), argued that the central spatial sense associated with *over* constitutes a ‘dynamic’ ‘above-across’ meaning element. Lakoff explicitly claims that this sense encodes a ‘path’ along which the TR travels. Evidence for this analysis comes from examples such as (6).

- (6) a. The cat jumped over the wall.  
b. The UFO flew over the city.

A central issue raised by the claim that *over* has a ‘movement’ ‘above-across’ sense associated with it is whether any preposition encodes motion with accompanying trajectory information. We argue that they do not. Rather, a motion reading follows from the nature of the activity being engaged in, the nature of the TR, and/or the nature of the LM. That is, the complex conceptualization which arises is due to the integration of sentential elements as interpreted through our knowledge of the world. Hence, the information which results in a ‘dynamic’ reading is distributed across the sentence, rather than being solely due to the preposition.

Two additional issues arise from this analysis. First, in conducting semantic analyses of prepositions, we need to carefully identify which meaning components are conventionalized by a particular preposition. In section 4, we

introduce the notion of a conventional *functional element*, which we suggest arises due to the spatio-geometric character of the central spatial sense associated with a particular preposition. Path, we will suggest, is a functional element which is conventionally associated with a number of prepositions (although *over* is not one of them). By identifying the conventional spatio-geometric semantics and functional element(s) associated with a particular preposition, we demonstrate how it is possible to avoid attributing a particular meaning to a preposition which properly arises from its interaction with other sentential elements.

The second issue relates to the concept of ‘movement’. It appears that cognitive semanticists have often tacitly conflated the notions of trajectory, path, and motion in a hybrid category of ‘movement’ or ‘dynamism’.<sup>3</sup> An important aspect of our argument is that motion, trajectory, and path (as well as orientation and goal) are distinct (albeit related and often correlated) concepts. We will briefly define motion, trajectory, and path as follows (although see section 4): (i) *Motion* involves change of an entity’s location over time (i.e., a complex conceptualization—in the sense defined above—which integrates the spatial dimension traveled with time); (ii) The *trajectory* is the shape of the motion event; and (iii) *Path* is a consequence of an end point or goal being related (i.e., connected) to a starting point or locational source by virtue of a series of contiguous points.

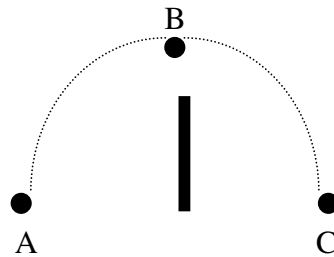
In order to begin to address the two issues described in the foregoing, let us consider the sentence in (6a). The case for attributing a dynamic ‘above-across’ sense to *over* in examples such as (6a) relies on implied reasoning which runs as follows: (i) a spatial scene is conceptualized in which a cat starts from a position on one side of the wall and comes to be in a position on the other side; (ii) there is nothing in the sentence, other than the preposition *over*, which indicates the trajectory followed by the cat; (iii) and as a trajectory is entailed by a moving entity, *over* must prompt for an ‘above-and-across’ trajectory. But this conclusion is a *non sequitur*. The very fact that a trajectory is not explicitly denoted by specific linguistic forms (formal expression) does not entail that such information is otherwise absent from the interpretation (and hence attributable to *over*). On this view, all elements that are salient in the interpretation of a scene would have to be coded linguistically.

Rather than representing the ‘spatial’ meaning of prepositions as carrying detailed information about each scene being described, including whether or not there is a trajectory and therefore the information that the TR is capable of undergoing motion, we argue that they prompt for schematic conceptualizations—in previous work we have termed this a *proto-scene*

(Tyler and Evans 2001, 2003; Evans and Tyler, 2004)—that are interpreted within the particular contexts in which they occur. Under our analysis, motion (and the trajectory which an entity in motion entails) is prompted for by the verb, and what we know about cats, their goals, walls (as impenetrable barriers to forward motion), and the key spatial configuration (including the resultant functional element) denoted by the preposition.

In (6a), the verb *jumped* does prompt for a conceptualization involving motion, which entails the TR following a trajectory. The interpretation of the ‘above-across’ movement in (6a) is not prompted for by *over* (i.e., the concept of the TR in motion is not a semantic attribute of the proto-scene, nor of any of the other distinct senses associated with *over*), but rather arises from the integration of linguistic prompts at the conceptual level. Most of the information required to integrate the linguistic prompts and construct a mental conceptualization of the spatial scene is filled in by inferencing and real-world knowledge. In turn, this knowledge constrains the possible interpretations that *over* can have in this particular sentence. In the interpretation of (6a), such encyclopedic knowledge includes (at the very least): (i) our understanding of the action of jumping, and in particular our knowledge of the kind of jumping cats are likely to engage in (that is, not straight up in the air as on a trampoline and not from a bungee cord suspended from a tree branch extending above the wall); (ii) our knowledge of cats (for instance, that they cannot physically hover in the air the way a hummingbird can); (iii) our knowledge of the nature of walls (that they provide vertical, impenetrable obstacles to forward motion); and (iv) our knowledge of force dynamics such as gravity (which tells us that a cat cannot remain in mid air indefinitely, and that if the cat jumped from the ground such that, at some key point, its trajectory matches the relation described by *over the wall*, then it would have to come to rest beyond the wall, providing an arc trajectory. Thus, we argue that the interpretation regarding the ‘above-across’ trajectory in sentence (6a) is not prompted for by *over*, but rather arises from the integration of linguistic prompts at the conceptual level, in a way that is maximally coherent with and contingent on our real-world interactions.

We further suggest that part of the general understanding of this particular sentence involves the interpretation of *the wall* as an obstacle which *the cat* is attempting to overcome. Hence, the salient spatial location is the point at which the cat jumped high enough to overcome the obstacle. To make this point more concrete, consider Figure 1, which offers an approximate depiction of the complex conceptualization constructed in the interpretation of (6a).



**Figure 1** *The cat jumped over the wall*

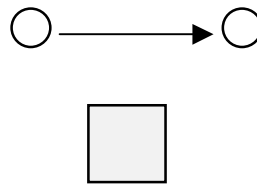
In Figure 1, the various positions occupied by the TR, the cat, along its trajectory are represented by the three spheres labeled A, B, and C. Notice that only point B—the point at which the cat is higher than but in potential reach of the wall—is explicitly mentioned in the sentence (i.e., this point in the trajectory is explicitly prompted for by the occurrence of *over*). Points A and C are inferred from what we know about jumping, cats, and walls. The verb *jumped* codes self-propelled motion using a solid surface to push off from; thus, point A is implied as the initial point of the trajectory. The prompts are integrated in such a way that the trajectory initiated by the verb *jump* intersects with point B. Our knowledge of real-world force dynamics fills in position C. Put another way, if a cat begins at point A and passes through point B, then given our knowledge of gravity and the kind of jumping cats are able engage in, point C is entailed.

Accordingly, the problem with attributing a dynamic sense to *over* is that such an analysis fails to fully distinguish between formal expression in language, which represents certain limited information, and patterns of conceptualization, which integrate ‘distributed’ information prompted for by other linguistic elements of the sentence together with our knowledge of the world. *Over* does not itself prompt for an ‘above-across’ sense, that is, for a trajectory which is *ipso facto* entailed by motion.

Now let us consider the example in (6b). As with our discussion of (6a), we suggest a trajectory is prompted for by virtue of the lexeme *flew*, together with what we know about UFOs and the kind of activities (we assume) they engage in. The shape of the trajectory is constrained both by *over* (which provides the information that the TR is higher than the LM) and the nature of the LM, the city, which is horizontally extended. However, even though the interpretation of the trajectory is constrained, the information provided by the linguistic code nevertheless underdetermines the exact shape of the trajectory.

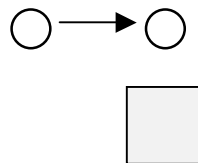
Indeed, we find at least three plausible ‘construals’ for this sentence, as illustrated below:

- a. Construal 1 stipulates that the UFO flew above and across the city, such that it originated in a position not above the city, moved over the city, and came to be in a position beyond the city (see Figure 2).



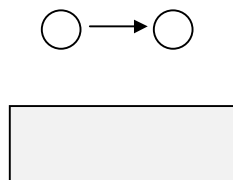
**Figure 2.** *The UFO flew over the city* (construal 1).

- b. Construal 2 stipulates that the UFO moved from a position in which it was not over the city, to a position such that it came to be directly over the city (see Figure 3).



**Figure 3.** *The UFO flew over the city* (construal 2)

- c. The third construal is one in which the UFO flies around while remaining above the city (see Figure 4).



**Figure 4.** *The UFO flew over the city* (construal 3).



The fact that there are (at least) three distinct construals for this sentence illustrates that the TR noun phrase, the LM noun phrase, and the verb of motion can be integrated in a number of ways. This, in turn, illustrates (i) the importance of integration and (ii) that lexical items are merely prompts for a process of conceptual integration (rather than 'fully specified' entities).

In sum, we have argued that the conceptualizations in which *over* participates do often involve the notion of motion and, hence, a trajectory. However, the motion and accompanying trajectory interpretation is prompted for by the conventional meaning associated with other elements, notably the verb, but also the TR, as in flying objects such as UFOs or planes, or the LM, as in LMs which serve as obstacles to forward motion or in horizontally extended LMs such as cities. These sentential elements serve to constrain and delimit how *over* is interpreted, and in this sense, the spatial relation designated by *over* in any given local context is 'distributed' across the sentence. A greater appreciation of the role of sentential context in meaning construction suggests, then, that *over* does not have, and indeed no English preposition has, a 'movement' sense associated with it.

Nevertheless, certain prepositions, such as *over*, do seem more likely to participate in 'movement' readings than other prepositions, such as *on*. To understand how and why *over* often participates in 'movement' readings, while *on* is less likely to do so, we require a descriptively adequate characterization not just of the preposition's core spatio-geometric semantics (i.e., the precise nature of the TR-LM configuration), but also of the functional element(s) which arise as a consequence of these spatial properties. But note that even a 'non-dynamic' preposition such as *on* can participate in a movement reading, as in *Chris ran on the highway for an hour*. In sections 5 and 6, we consider two prepositions which have often been assumed to designate 'movement', namely *to* and *through*. By virtue of carefully teasing apart the distinct concepts *orientation*, *trajectory*, *goal*, and *path* (see section 4), contrasting these with motion, and providing a descriptively adequate characterization of these two prepositions, we seek to demonstrate that it is erroneous to assume that such prepositions designate 'dynamism' and a trajectory which is inevitably entailed by an entity in motion.

### 3. Atemporality and motion

In essence, the core semantics associated with prepositions has to do with spatial configurations. Moreover, the spatial configurations in question are

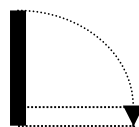
relational, mediating a physical locator (the LM) and a physical locand (the TR). The nature of the relation profiled by prepositions can be distinguished from that profiled by another salient relational class, namely verbs (for a discussion of *profiling*, see Langacker, e.g., 1987, 1991, 2000).

Verbs profile processes which necessarily evolve through conceived time. While the temporal dimension is the essence of the profiled relation encoded by verbs, it is ignored by prepositions (in terms of their core spatial characterization). Evidence that prepositions encode relations which are atemporal comes from the so-called reflexive senses.

Spatial reflexivity (first noted by Lindner 1981) is the phenomenon whereby a single entity which occupies multiple positions is conceptualized such that two salient positions occupied by the entity are integrated into a TR-LM spatial configuration. A preposition such as *over* can be used to mediate a spatial relation between the two positions, even though the same entity cannot simultaneously occupy two distinct spatial positions in the world. The dynamic character of experience is reanalyzed as a *static* spatial configuration. Langacker (1987) discusses this Gestalt-like static conceptualization of a dynamic process as *summary scanning*. Consider (7):

(7) The fence fell over.

In (7), the TR, the fence, is distinguished in its initial (upright) position from its final position, in which it is lying horizontally on the ground. In our everyday experience with the world, sometimes we see erect objects, such as a fence, fall through a ninety-degree arc to a resting position on the ground. We also frequently observe the same object at separate times in two different positions, i.e., at one point in time when the object is erect, at a later point in time when the object is resting on the ground; in this situation, we typically infer that the object has moved through a ninety-degree arc. From these experiences, a conceptual spatial relation is abstracted (via both summary scanning and inferencing), mediating the two temporally situated locations into a single (atemporal) spatial configuration. In the world, no such spatial configuration exists; after all, the same fence cannot be in two locations at the same time. However, by conceptualizing the fence reflexively, the same entity can be both the TR and the LM (see Figure 5).



**Figure 5.** The reflexive sense

The consequence of the claim that spatial particles and prepositions do not profile temporally evolving processes, but rather atemporal spatial configurations is that prepositions *ipso facto* cannot encode motion. This follows as motion results from change of location over time, and hence constitutes a temporally evolving process.

#### **4. Functional concepts: Orientation, trajectory, path, and goal**

In this section we consider four functional elements: orientation, trajectory, path, and goal. As we will see in subsequent sections (5 and 6), while orientation and goal relate to the semantics of *to*, the element of path relates to *through*. As these elements often correlate with motion, the error committed by previous scholars in labeling certain prepositions as encoding ‘dynamism’ can be seen, we argue, as a consequence of failing to carefully identify these distinct meaning components, and the particular prepositions with which they are conventionally associated.

As we have already intimated, the functional element (or elements) associated with a particular preposition arise(s) as a consequence of our continued and ubiquitous interaction with spatial scenes involving certain spatial configurations. Take for instance a spatial scene involving a TR and a *bounded* LM—a landmark which can be characterized by the spatio-geometric property of having four sides, such as a box, and hence possessing an interior and exterior. One consequence of our interaction with certain kinds of bounded LMs is that we experience them in terms of containment.

Containment itself is a complex relation involving numerous functional consequences. In the guise of containers, bounded LMs constrain and delimit movement of their TRs, as in a coffee cup which constrains the coffee it contains to a specific location, or a prison cell, which restricts the movements of a convict. In certain circumstances, constraining movement can be

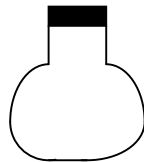
understood as providing support; thus, a cut flower can be held in an upright position as a result of being placed in a vase. If the boundaries of the container are opaque, they prevent us from seeing beyond them, or the interior area from being seen by entities outside, as in a walled garden or a windowless room. Containers can also provide protection, as with a jeweler's safe. For the elements within a container, the container surrounds and largely determines the environment in which those entities exist. Different aspects of the experience of containment are profiled by the various uses of the spatial particles *in* and *out*.

A second consequence of our interaction with bounded LMs is that they can serve as goals. For instance, after leaving work, for many people the goal is to arrive at home in order to interact with family, relax, etc. The *salient space* in which these anticipated activities take place is a bounded LM, the living quarters; thus, being *in* the salient space, the bounded LM, is closely related to achieving goals.

A third way in which we interact with bounded LMs is that we emerge from them, as when we leave home each morning. Equally, we draw other entities from bounded LMs, as when a jeweler withdraws a diamond brooch from a safe. In this way, bounded LMs have source properties, as lexicalized by *out of*.

A fourth way in which we interact with bounded LMs is when we enter, pass from one side to another, and exit, as when walking from room to room in a building. Thus, we can experience a bounded LM as a passageway with a source location and a highlighted end point (or goal). This relation is captured by *through*.

Vandeloise (1991, 1994) has been one of the most forthright advocates for the view that particles such as prepositions cannot be equated solely with spatial elements. Consider the diagram provided in Figure 6.



**Figure 6.** After Vandeloise (1994: 172).

Vandeloise observed that an image such as that depicted in Figure 6 could be construed as being either a bottle or a lightbulb. However, while we can felicitously describe the relation between *the lightbulb*, the TR, and its LM, *the socket*, in terms of a spatial relation designated by *in* (cf. 8), we cannot thus describe the relation between a bottle and its putative LM, *the cap* (cf. 9):

- (8) The bulb is in the socket.  
 (9) <sup>??</sup>The bottle is in the cap.

Vandeloise points out that as the spatial relation holding between the TR and LM in each of these sentences is identical, and yet (8) is fine while (9) is semantically anomalous, a spatio-geometric configuration alone cannot account for the relation described by *in*, or any other spatial particle. He argues that the relevant factor accounting for the contrast in acceptability between sentences (8) and (9) is functional: "While the socket exerts a force on the bulb and determines its position, the opposite occurs with the cap and the bottle" (Vandeloise 1994: 173). Put another way, not only is the position and hence successful functioning of the bulb contingent on being *in* (i.e., contained by) the socket, the socket also prevents the bulb from falling to the ground and thus provides a constraining or supportive element. In contrast, the position and successful functioning of the bottle is not contingent on being *in* the cap.

Herskovits (1986, 1988) has also emphasized that spatio-geometric relations are not sufficient to explain the complete range of spatial uses commonly associated with spatial particles. For instance, she noted that *in* applies to a wide range of spatial scenes, many of which do not require that the TR be enclosed by the LM. For example, *in* can be employed in the sentence *The pear is in the bowl* to describe a spatial scene in which the bowl holds so many pieces of fruit beneath the pear that it is physically higher than the rim of the bowl, and hence not strictly enclosed within the LM. She argued that the fact that native speakers of English can use *in* to describe spatial scenes of this kind indicates that principles beyond spatio-geometric relations must be involved. The observation that the lexeme *in* is associated with a functional relation (in addition to purely spatial properties) has also been noted by Sinha and Jensen de López (2000),<sup>4</sup> as well as by researchers involved in language acquisition (Bowerman 1996) and psycholinguistic experimentation.<sup>5</sup>

We now turn to the four functional elements we will consider. We begin with the functional notion of *orientation*. Orientation arises as a consequence of spatio-geometric asymmetry of the TR (or LM), resulting in asymmetric perceptual access. Orientation (with the asymmetric perceptual access and

directional bias it affords) is a consequence of the morphology, in the biological sense, of animate entities. Hence, orientation is a functional consequence of physiology.<sup>6</sup> In order to illustrate the notion of orientation, consider the sentence in (10):

(10) The soldier stood still facing east.

In this sentence, the TR, the soldier, is functionally asymmetrical with respect to the LM. That is, the TR's inherent front-back asymmetry allows the TR to be directed to or from the LM, designated by the cardinal location *east* (and hence facilitates asymmetric perceptual access, canonical direction of motion, etc.). Being directed with respect to a LM is to be oriented with respect to the LM. Importantly, being oriented does not entail that the TR undergoes motion, as is evident from this example of a static TR.

We now turn to a consideration of *trajectory*. While motion relates to change of location, trajectory relates to the 'shape' of the motion event. This represents a departure from previous analyses (e.g., Herskovits 1986; Lakoff 1987; Langacker 1987; Vandeloise 1991; Talmy 2000). Our view is that the trajectory is inseparable from a motile TR and represents the course of motion the TR undergoes. Put another way, a trajectory is a functional consequence of the particular spatial locations occupied by a particular TR as it undergoes motion. The trajectory or 'shape' of the motion is integrated into a coherent concept independent of the motion itself. This follows as we are able to conceive of TRs executing particular 'shapes' even when such trajectories do not objectively exist in the world, but rather, result from integrating a series of distinct albeit contiguous locations occupied by a particular TR in memory. The following example evidences the functional element of trajectory:

(11) The stunt plane performed a perfect loop-the-loop at the air show.

In this example, the expression *loop-the-loop* describes a particular trajectory, conceived as circular. Hence, a trajectory is a functional consequence of a TR's motion. As we argue that English prepositions do not denote motion, we argue that they cannot denote a trajectory. As being oriented does not entail motion, neither does it entail a trajectory.

In view of the foregoing, we now consider how the functional notion of *path* is distinct from that of trajectory. Path, while related to trajectory, is a consequence of an end point—conceived of as a goal—which is being related to a starting point or locational source by virtue of a series of contiguous

points. That is, the concept of path requires a particular spatial goal. In so far as a goal implicates intentionality, intention to realize the particular goal is what distinguishes a goal from just any end point. The spatial goal is achieved by being connected to a spatial source by virtue of a series of contiguous points.

As noted, path is a functional element, which arises due to the way we interact with and reach goals, given that we act with intention and begin from a particular starting point or locational source. Accordingly, this concept is distinct from those of trajectory and motion. In particular, as a path is conceived as relating a source with a goal, it is conceptualized as facilitating passage, which is why prototypical paths provide a particular material and conventional means of translocating potential obstacles, e.g., tunnels, bridges, footpaths, roads, etc. For instance, by virtue of a tunnel existing in (12),

(12) The tunnel through Vale Mountain was finished in the 1980s.

passage from one side of an otherwise impenetrable barrier, the mountain, is facilitated, whether or not the spatial scene involves a TR capable of undergoing motion.<sup>7</sup> It is this notion of a particular relation between a source and a goal and the accompanying notion of facilitation of passage, conceptually independent of a motile TR and its trajectory, which constitutes the concept of path.

Further evidence for the functional notion of path absent motion comes from scenes involving 'traces' of a TR's passage, even when the TR itself is no longer apparent. For instance, a line of trampled grass transecting a field or a smoke trail across the sky are labeled paths, even though the respective TRs, e.g., a person and a plane, are no longer in view. However, a means of passage, such as a tunnel, or a 'trace' of passage are merely associated with the notion of path, rather than constituting the notion. We reiterate that the concept of path concerns a starting point or locational source being related to an endpoint conceptualized as a goal by virtue of a series of contiguous points intervening between the two extremities.

The functional notion of *goal* is closely related to that of path. While the endpoint of a path is in principle a spatial location (or an entity occupying the spatial location) equivalent to other points along the path, in many instances the endpoint has additional salience. This follows as the endpoint often constitutes the motivation for the path in the first place. Hence, a functional consequence of a spatial endpoint is that it is particularly salient, in focus, and is typically the subject of intentional attempts to reach it. The notion of goal, then, is a functional consequence of the salient LM.

## 5. The case of *to*

We have argued (Tyler and Evans 2003) that the core spatial semantics of *to* designates a relation in which the TR is oriented with respect to a salient or (conceptually) highlighted LM. This configuration often occurs in scenes involving a motile TR. Indeed, many previous analyses, based on examples such as (13), have assumed that motion or dynamism is an inherent part of the basic meaning associated with *to*:

- (13) She walked/ran/went/drove/cycled to the store.

However, a path—in the sense of a series of spatially contiguous locations mediating a starting point and an end point which is conceived as a goal—is not inevitably associated with *to*, as illustrated by the following examples in which only orientation is apparent:

- (14) a. He stood with his back *to* me. (TR is not oriented towards the LM)  
 b. The conservatory faces *to* the south so it gets sun all day long.

In the examples in (14), the TR is oriented *vis-à-vis* the LM. In these examples, motion of the TR is not implicated, nor is it made explicit that there is a path along which the TR could undergo locomotion. In order to account for the ‘static’ reading in (14) and the ‘dynamic’ reading in (13), one might posit that *to* has both an orientation and a movement sense. However, there are reasons to suspect that the ‘dynamic’ reading apparent in (13) arises from context, rather than being a conventional meaning associated with *to*.

One of the charges which has been leveled against some semantic network theorists is that they may have vastly overestimated the number of distinct senses associated with a particular preposition. Sandra (1998) in particular has strongly argued for clearly articulated ‘decision principles’ for determining what counts as a distinct sense in a polysemy network. In our model of principled polysemy (Tyler and Evans 2001, 2003), we offer two such criteria for determining whether a sense is distinct and instantiated in memory or whether it is a contextualized variant of a particular sense. Both of these criteria must hold for a usage to count as a distinct sense of a particular preposition. These criteria are detailed below:



- (15) i. A usage counts as a distinct sense if it adds meaning not associated with any other sense;  
 ii. A usage counts as a distinct sense if at least some of its instantiations cannot be derived from context (i.e., they are context-independent).

Clearly, the ‘dynamic’ reading of (13) contains additional meaning with respect to the orientation reading in (14). Indeed, while orientation is an immanent aspect of motion (motion requires orientation), the reverse does not follow, i.e., orientation does not require motion—as evidenced by the examples in (14). Hence, the dynamic reading in (13) provides additional information not available in the orientation readings in (14). As such, the criterion in the first part of (15) is satisfied. In terms of the second criterion, for the ‘dynamic’ reading to count as a distinct sense, some instances of this reading must be context-independent, which is to say, they must be apparent absent a sentential context otherwise involving motion. However, a motion reading associated with *to* is apparent only when a verb of motion is supplied. While orientation is apparent in all the examples involving *to*, i.e., those in (13) and (14), motion is only licensed in specific contexts, namely involving verbs of motion. In this, the motion reading associated with *to* appears to be contingent upon sentential context, and hence constitutes a situated implicature of dynamism (recall the discussion of *over* in section 2).

Despite our claim that *to* does not, at base, provide a dynamic meaning element, *to* can readily participate in utterances in which a dynamic reading is derived. This follows, as not only is *to* associated with the notion of orientation, it is additionally associated with the functional notion of goal. After all, a consequence of being oriented with respect to a particular LM which is highlighted is that in many cases the LM constitutes an objective or goal, which motivated the orientation in the first place.

There are a number of lines of evidence to support this view. For instance, consider the contrast between *to* and *toward(s)*:

- (16) a. He ran to the shop.  
 b. He ran towards the shop.

In (16a), the typical interpretation is that the TR is directed with respect to the LM, the shop, and that this LM constitutes the TR’s goal (e.g., the TR wishes to make a purchase in the shop). A consequence of the motion verb, in

conjunction with *to*, is that a path is evoked, resulting in a reading in which the TR did indeed arrive at the shop. In contrast, in (16b) the typical reading is a TR moving in the direction of the LM which is referenced by virtue of a convenient LM, the shop. That is, the shop is not the focused endpoint, but simply provides a means of referencing the general direction with respect to which the TR is oriented. One consequence of this is that even with the same verb of motion it is not entailed that the TR arrives at the shop.

Further evidence that supports the characterization of the LM as goal comes from examples of the following kind:

- (17) As Jim was being verbally attacked in the meeting, he looked to his line-manager (for support).

The verb *look* normally collocates with *at*. Yet, in this example the TR, Jim, is looking at the LM, his line-manager, for a particular reason, namely for verbal support. Accordingly, the orientation of the gaze is motivated by a particular goal, i.e., his line-manager seated at a particular location, and potential support; hence the use of *to*. Interestingly, in this sentence a path reading is evoked, because we conceive of sight as involving a linear ‘path’ (e.g., *his line of vision*), while there is no motion involved.<sup>8</sup>

A final line of evidence for associating the LM with the functional notion of goal comes from examples of the following kind:

- (18) He runs (past the quarry) to the hills every day.

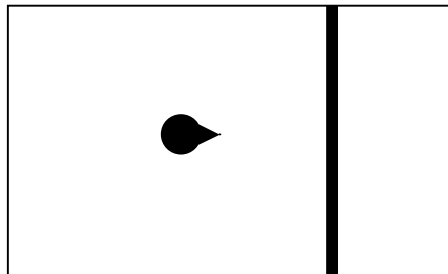
Sentence (18) conveys more than that the TR is oriented (and indeed moving in the direction of) the hills, but that reaching the hills constitutes the TR’s objective, as part of a fitness regimen, perhaps. This information is more than implicit background knowledge, as it actually surfaces in the semantic acceptability of prepositions. Consider the sentences in (19):

- (19) a. \*He runs to the quarry every day. [Goal: the hills]  
 b. He runs past the quarry every day. [Goal: the hills]

Indeed, unlike (19b), sentence (19a) would be semantically odd if the end point of the run is the hills, and the quarry is only half way between the runner’s home and the hills; and this would be so even if the runner is oriented in the direction of the quarry. This follows as *to* provides information about the runner’s goal, which is to reach a particular point, at a given distance from the

starting point before turning around and running back. In other words, as the goal constitutes the highlighted endpoint of a TR’s movement, as described in section 4, *to* cannot be employed in an utterance in which a TR is related to a point other than the highlighted LM, as illustrated by the anomaly of (19a).

As noted in section 2, we propose that the ‘core’ semantics associated with a preposition can be captured by what we term a *proto-scene*. A proto-scene is an abstraction ultimately arising from recurring real-world spatial scenarios and represents an attempt to model the core spatial semantics (the primary or central sense) for a particular preposition. It constitutes a highly schematic TR-LM representation together with attendant functional elements which commonly result from such a configuration. In the proto-scene for *to*, *to* denotes a spatial relation in which an oriented TR is directed towards a highlighted LM. Within this spatial configuration, the highlighted status of the LM makes it readily interpretable as a primary goal. Hence, the functional element associated with *to* is the LM as goal. Figure 7 represents the proto-scene for *to*, with the black circle representing the TR, and the arrow representing the orientation.



**Figure 7.** The proto-scene for *to*

The vertical line represents the LM. Note that the LM is in bold, indicating that the LM is profiled. The functional element associated with the proto-scene is that the LM constitutes the TR’s goal.

In sum, what the foregoing discussion reveals is that whether either path or motion is evoked depends upon sentential context and how the semantics of the preposition (and the other elements) interact. Hence, the interpretation that the TR reaches the LM in (16a) is a consequence of the interaction of a particular set of sentential elements; in contrast, in (17), there is no sense of

motion, and while a path is evoked, the TR is not understood as physically ‘arriving at’ the LM’s location. In this way, the present perspective posits that the interaction of the set of elements in question gives rise to ‘distributed’ meaning, while also retaining the position that individual lexical items do have conventional meaning elements or senses associated with them (e.g., proto-scenes). Moreover, this does not necessitate the claim that *to* must be contributing a ‘path’ meaning element. As the functional element associated with *to* is that of the LM as goal, a consequence of this is that when integrated with a motion verb, the TR’s orientation, together with the functional element of goal, gives rise to the evocation of a path, as in (17), or a reading of motion as in (16a). It is these contextualized readings of ‘movement’ which some scholars have attributed to the preposition *to*.

## 6. The case of *through*

We now turn to a consideration of *through*. While the spatial relation designated by *through* relates to the structural elements interior, boundary, and exterior, and hence to a bounded LM, it comprises additional structural elements which we term entrance point, exit point, and the contiguous locations between the entrance point and exit point. In other words, the proto-scene for *through* designates a spatial relation in which the TR is held to occupy a contiguous series of spatial points with respect to a LM which has an interior structural element such that these points are located on the exterior side of the LM coincident with the entrance point, within the LM, and on the exterior side of the LM opposite to the entrance point, i.e., the exit point. The entrance point is understood as the locational source and the exit point as the goal. A consequence of the particular spatial designation associated with *through* is that the functional notion of *path* is evoked.

As noted, *path* is a functional element which arises due to the way we interact with and reach goals (the exit point associated with *through*), given that we begin from a particular starting point or locational source (the entrance point associated with *through*). Accordingly, this concept is distinct from those of trajectory, goal, orientation, and motion. For instance, in the following sentence,

- (20) The tunnel through Vale Mountain was finished in the 1980s.

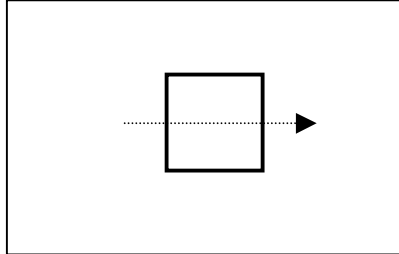
by virtue of a tunnel existing in (20), passage from one side of an otherwise impenetrable barrier, the mountain, is facilitated, whether or not the scene involves a TR capable of undergoing motion.

As *through* characterizes a spatial relation denoting a TR and a bounded LM in which two locations on either side of a LM are related (the entrance point and exit point, respectively), the associated functional element is that of path. As such, the path is held to be conceptually distinct from the motion often associated with it. Interestingly, as paths are often associated with motion,<sup>9</sup> motion can be evoked due to background knowledge, even in spatial scenes which are wholly non-dynamic in nature, as in (21) below:

- (21) a. The sunlight shone through the glass door.  
b. I sensed the cold through the glass door.  
(cf. John walked right through the glass door.)

In the example in (21a), there is no (perceptible) motion associated with the spatial scene. Indeed, motion is typically coded by verbs which involve events evolving through time. As *through* is a preposition and hence atemporal, it does not code for motion. However, by virtue of *through* being employed, the notion of a path is salient, which strongly correlates with the idea of the TR physically passing or having passed from one side of the LM to the other. For instance, the sunlight is conceived as physically having passed from one side of the door to the other in (21a). In (21b), the cold is sensed (and thus experienced) on one side of the door, even though it originated on the other. The use of *through* is strongly suggestive that the coldness is experienced by virtue of a physical transfer from one side of the door to the other.

Thus, the relation described by *through* describes a spatial relation in which a bounded LM is transected by virtue of an entrance point and an exit point. The functional element evoked is that of path. For this reason, *through* is often associated with motion. The proto-scene for *through* is diagrammed in Figure 8.<sup>10</sup>



**Figure 8.** Proto-scene for *through*

## 7. Conclusion

In this paper, we have argued against the view that prepositions designate motion. We have suggested that prepositions such as *to* and *through* are associated with spatial properties in addition to a functional element. The functional element arises as a consequence of our daily interaction with the spatial configuration associated with the particular preposition. While *to* is associated with a spatial configuration in which a TR is oriented in the direction of a LM, its functional element is that of the LM constituting the TR's goal. We suggested that due to the integration of spatial and functional elements with sentential context, particularly motion verbs, a movement reading is derived. Previous scholars have assumed this is due to the preposition itself. With regard to *through*, its semantics are associated with a spatial configuration involving contiguous locations from one side of a bounded LM to the other. The functional element is that of path, which, while correlating with motion, is distinct from it. The notion of motion which often arises in sentences involving *through* is due to the integration of the spatial and functional character of *through* with other sentential prompts for movement such as motion verbs.

In addition, we have also suggested that path readings commonly associated with utterances involving particular prepositions such as *to* (and *over*) may be better accounted for by a 'distributed' semantics, in which sentential context gives rise to particular readings, rather than such readings being conventionally associated with the preposition in question. In essence, we have argued for carefully articulating the nature of conventional content

associated with prepositions, including both spatio-geometric and functional content, and for teasing apart distinct and distinguishable (albeit related) concepts such as orientation, path, trajectory, goal, and motion.

## Notes

1. The terms *trajector* (TR) and *landmark* (LM) derive from Langacker's Cognitive Grammar framework. A TR is the focal participant in a profiled relationship, while the LM is the secondary participant. Moreover, the TR is likely to be the smaller motile entity, which is located by virtue of the LM which serves as a backdrop to locate it. In a spatial scene described by the sentence: *The ant is in the box*; the ant corresponds to the TR, while the box corresponds to the LM.
2. These criteria are detailed in section 5.
3. Kreitzer (1997) labels the 'above-across' path sense considered by Lakoff (1987), the dynamic sense.
4. Sinha and Jensen de López (2000) make the following observation: "Move a cup of coffee, and the coffee goes with the cup. This property of containment is fundamental to the basic human usage of containers, which not only [...] enclose, but also constrain the movements of their contents. We can call this a functional, as opposed to logical, property of containment" (Sinha and Jensen de López 2000: 30-31).
5. Garrod, Ferrier and Campbell (1999) specifically tested spatial-geometrical versus functional aspects associated with the particles *in* and *on* in terms of native speakers' judgments concerning which spatial particle most appropriately described "spatially indeterminate" scenes, along the lines of Figure 6. They conclude that an account of spatial particles that includes both spatio-configurational and functional components is necessary to account for their results.
6. Non-animate entities are also conceived as being oriented if they are conceived as having a front/back or top/bottom asymmetry.
7. Path is independent of passage, and as such is conceptually distinct and distinguishable from motion. For example, in: *The tunnel transects the mountain*, while the tunnel facilitates passage, as is made clear in a sentence such as: *The cyclist raced through the Vale mountain tunnel*, the TR in the first sentence is the tunnel, which itself is a non-motile entity. That is, it can facilitate passage, but it cannot itself undergo motion.
8. Since orientation often does correlate both with path and indeed with motion, given that we are typically oriented with respect to our goal when we undergo motion towards our goal, as in the daily drive to work, for instance, it is perhaps not surprising that previous analyses have conflated these distinct notions and associated motion with *to*.
9. Note that a path does not require motion. For instance, disused tunnels still constitute paths, even though they are no longer in use.
10. It is worth noting that the proto-scene we posit is consonant with the "spatial image" of *through* presented by Hilferty (1999).

## References

- Bowerman, M. 1996. "Learning how to structure space for language: A crosslinguistic perspective." In *Language and Space*, P. Bloom, M. Peterson, L. Nadel, and M. Garrett (eds.), 385–436. Cambridge, MA.: The MIT Press.
- Brugman, C. 1988. *The Story of Over: Polysemy, Semantics and the Structure of the Lexicon*. New York: Garland Press.
- Brugman, C. and Lakoff, G. 1988. "Cognitive topology and lexical networks." In *Lexical Ambiguity Resolution*, S. Small, G. Cottrell, and M. Tanenhaus (eds.), 477–507. Palo Alto, CA.: Morgan Kaufman.
- Evans, V. and Tyler, A. 2004. "Spatial experience, lexical structure and motivation: The case of *in*." In *Studies in Linguistic Motivation*, G. Radden and K.-U. Panther (eds.), 157–192. Berlin: Mouton de Gruyter.
- Garrod, S., Ferrier, G., and Campbell, S. 1999. "In and on: Investigating the functional geometry of spatial prepositions." *Cognition* 72: 167–189.
- Herskovits, A. 1986. *Language and Spatial Cognition: An Interdisciplinary Study of the Prepositions in English*. Cambridge: Cambridge University Press.
- Herskovits, A. 1988. "Spatial expressions and the plasticity of meaning." In *Topics in Cognitive Grammar*, B. Rudzka-Ostyn (ed.), 271–298. Amsterdam: John Benjamins.
- Hilferty, J. 1999. "Through as a means to metaphor." In *Issues in Cognitive linguistics*, L. de Stadler and C. Eyrich (eds.), 347–366. Berlin: Mouton de Gruyter.
- Kreitzer, A. 1997. "Multiple levels of schematization: A Study in the conceptualization of space." *Cognitive Linguistics* 8: 291–325.
- Lakoff, G. 1987. *Women, Fire, and Dangerous Things: What Categories Reveal about the Mind*. Chicago: The University of Chicago Press.
- Langacker, R. 1987. *Foundations of Cognitive Grammar*. Vol. 1, *Theoretical Prerequisites*. Stanford, CA.: Stanford University Press.
- Langacker, R. 1991. *Concept, Image, and Symbol*. Berlin: Mouton de Gruyter.
- Langacker, R. 1992. "Prepositions as grammatical(izing) elements." *Leuvense Bijdragen* 81: 287–309.
- Langacker, R. 2000. *Grammar and Conceptualization*. Berlin: Mouton de Gruyter.
- Lindner, S. 1981. *A Lexico-Semantic Analysis of English Verb Particle Constructions with OUT and UP*. Ph.D. dissertation, University of California at San Diego. Distributed [1983] by the Indiana University Linguistics Club.
- Sandra, D. 1998. "What linguists can and can't tell you about the human mind: A reply to Croft." *Cognitive Linguistics* 9: 361–378.
- Sinha, C. and Kuteva, T. 1995. "Distributed spatial semantics." *Nordic Journal of Linguistics* 18: 167–199.
- Sinha, C. and Jensen de López, K. 2000. "Language, culture and the embodiment of spatial cognition." *Cognitive Linguistics* 11: 17–42.



- Talmy, L.. 2000. *Toward a Cognitive Semantics*. 2 vols. Cambridge, MA.: The MIT Press.
- Tyler, A. and Evans, V. 2001. "Reconsidering prepositional polysemy networks: The case of *over*." *Language* 77: 724–765.
- Tyler, A. and Evans, V. 2003. *The Semantics of English Prepositions: Spatial scenes, Embodied Meaning and Cognition*. Cambridge: Cambridge University Press.
- Vandeloise, C. 1991. *Spatial Prepositions: A Case Study in French*. Chicago: The University of Chicago Press.
- Vandeloise, C. 1994. "Methodology and analyses of the preposition *in*." *Cognitive Linguistics* 5: 157–184.