

# **Spatial experience, lexical structure and motivation: The case of *in***

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## **Abstract**<sup>1</sup>

This paper takes issue with the received view of lexical structure, which views the lexicon as being the repository of the arbitrary and the idiosyncratic. It is argued that the lexicon is systematically motivated. The traditional view of the lexicon is shown to be inadequate in three ways. These relate to the fact that a word can take on new meanings in novel contexts, that words tend to be polysemous, and that a single word can appear in a range of different lexical classes. The linguistic facts force us to conclude that, rather than being arbitrary and lacking in systematicity, lexical structure and organisation is in fact highly organised, achieving a particularly clear indication of a motivated system in the process of meaning extension. We illustrate the central claim that meaning extension is a highly motivated process, grounded in spatio-physical experience, with an analysis of the English lexeme *in*.

*Keywords:* distributed semantics, meaning extension, polysemy, pragmatic strengthening, preposition, principled polysemy, proto-scene, radial category, sanctioning sense, semantic network, situated implicature, spatial scene

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## 1. Introduction

In this paper we take issue with the received view of lexical structure, which views the lexicon as being the repository of the arbitrary and the idiosyncratic. A consequence of this position is that lexical items are arbitrarily related, resulting in a homonymy view of word meaning. Our purpose in this paper is to suggest that the lexicon, at least in the case of the closed class of prepositions, is systematically motivated. In Section 2 we argue that the traditional view of the lexicon is inadequate to account for the senses of prepositions in three ways. These relate to the fact that a word can take on new meanings in novel contexts, that words tend to be polysemous, and that a single word can appear in a range of different lexical classes. These linguistic facts force us to conclude that, rather than being arbitrary and lacking in systematicity, lexical structure and organisation is in fact highly organised, achieving its clearest indication of a motivated system in the process of meaning extension. In Section 3 we suggest that meaning extension, as it relates to prepositions, results from the complex interaction of spatio-physical experience and language use. We discuss this from the perspective of *principled polysemy* (Evans 2004; Evans and Tyler 2004; Tyler and Evans 2001, 2003), which constitutes a motivated account of word meaning and meaning extension. In Section 4 we illustrate one aspect of the motivated nature of meaning extension, i.e. the phenomenon of polysemy, by providing an analysis of part of the semantic network associated with the English preposition *in*. Accordingly, our goal in this paper is to demonstrate that the lexicon is highly motivated, and that due consideration reveals that lexical organisation and structure is highly intricate and systematic.

## 2. Lexical structure and motivation

Traditionally, the lexicon has been viewed as the repository of the arbitrary and idiosyncratic, with all regularity and productivity associated with language taking place in the syntax (Bloomfield 1933). This traditional view is still alive today, having been recently reasserted by Chomsky, who states, “I understand the lexicon in a rather traditional sense: as a list of “exceptions”, whatever does not follow from general principles” (1995: 235). A consequence of this traditional position is to view the lexicon as “a static set of words and word senses, tagged with features for syntactic,

morphological and semantic information, ready to be inserted into syntactic frames with appropriately matching features” (Tyler and Evans 2001: 725).

More recently, however, it has been realised by a range of lexical semanticists that the traditional view is simply incompatible with the linguistic facts (e.g. Brugman 1988; Brugman and Lakoff 1988; Evans 2004; Evans and Tyler 2004; Lakoff 1987; Pustejovsky 1995; Tyler and Evans 2001, 2003). This follows as there are (at least) three ways in which the traditional view of lexical organisation fails to match up with the behaviour of words. That is, the view of the lexicon as constituting a set of static words senses is incompatible with the “dynamic” nature of word meaning as outlined below.

First, the same word can be used in a diverse range of contexts, in which novel meanings are derived. This constitutes what we term the issue of on-line meaning construction (Tyler and Evans 2001) or, following Sinha and Kuteva (1995), *distributed semantics* (see Evans and Tyler 2003). That is, word meaning is context-sensitive drawing upon encyclopaedic knowledge as well as inferencing strategies which relate to different aspects of conceptual structure, organisation and packaging (see Croft and Cruse 2004; Evans and Tyler 2004; Langacker 1987; Sinha and Kuteva 1995; Sweetser 1999; Tyler and Evans 2003).

For instance, consider the following sentences (adapted from Herskovits 1986):

- (1) There’s some fruit in the bowl.
- (2) There’s a crack in the bowl.

These examples illustrate that a particular Trajector (TR) can, in conjunction with a particular Landmark (LM), affect the interpretation of a preposition.<sup>2</sup> On one hand, the interpretation ascribed to sentence (1) is that the LM, *the bowl*, contains or surrounds the TR, *the fruit*. On the other hand, the conventional interpretation of (2) is that the TR, *the crack*, constitutes a

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2. 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, mobile entity, which is located with respect to the LM, which serves 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.

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 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 veridically distinct entity. The different status of these two items differentially affects the interpretation of the relationship designated by the preposition. In this way, the meaning assigned to the preposition is “distributed” across the sentence.

The point then is that a theory of lexical structure requires a motivated account of how word meaning is integrated within the overall context of the sentence or even larger units. That is, a theory of *distributed semantics* is required (cf. Sinha and Kuteva 1995), a theory which recognises that utterance meaning is the result of the integration of word senses in a way which is coherent with, and contingent upon, real-world knowledge. As such, utterance meaning does not reside in individual lexical items, but rather results from their interaction, which serves to prompt for integration at the conceptual level guided by a range of inferencing strategies (see Tyler and Evans 2001, 2003).

The second way in which the traditional view of the lexicon is inadequate relates to the phenomenon of polysemy. Under the traditional view, conventional word meanings associated with many lexical items sharing the same form are unrelated to one another (a homonymy position). Contrary to this position, we argue that lexical items do not act like static bundles of features, but rather evolve and change, such that new senses are derived from pre-existing senses. Hence, lexical items are modelled as constituting categories made up of distinct but related senses (Evans 2004; Lakoff 1987; Taylor 2003; Tyler and Evans 2001, 2003).

Influential studies such as Brugman (1988) and Lakoff (1987), which examined the English preposition *over*, have demonstrated that senses as diverse as ‘above’, e.g. *The picture is over the mantle*, ‘covering’, e.g. *The clouds are over the sun*, and ‘completion’, e.g. *The relationship is over*, are related to one another, and thus provide evidence that word meaning is neither a static phenomenon, nor is a homonymy perspective always plau-

sible. Just as word meanings can “change” in context, by virtue of their differential interaction with other sentential elements, so the inventory of word senses conventionally associated with a lexical item can change, with new word senses evolving. Hence, a theory of lexical organisation requires a motivated account of the experiential and conceptual factors that facilitate the derivation of new conventional senses, and thus an account of the nature and origin of polysemy.

The third way in which the traditional view of the lexicon is inadequate relates to the phenomenon of the part of speech of lexical items. Traditionally, lexical items have been viewed as being tagged with a range of lexical, semantic and syntactic features. Hence, a word such as *in*, for instance, is tagged as belonging to the lexical class of prepositions. However, *in* can also appear in a range of different syntactic configurations in which it is clearly not preposed with respect to a noun phrase. This is illustrated by its adverbial usage in (3a), with the copula, and its usage as part of a verb particle construction (or phrasal verb) in (3b):

- (3) a. The sun is in.  
b. The little boy went in (for his supper).

Due to its view of word meaning as being static sets of features, the traditional approach is forced to conclude that a difference in lexical class is evidence for distinct lexical items. However, such an account fails to recognise that the meanings associated with *in* in a prepositional use such as (1), for instance, and the usages in (3a) and (3b) appear to be strongly related.

### **3. Meaning extension as a Motivated Phenomenon**

In this section we address the issue of polysemy, the phenomenon whereby a single linguistic form is associated with a number of related but distinct *senses*.

#### **3.1. Polysemy**

In order to illustrate the phenomenon of polysemy consider the following examples:

- (4) a. The puppy is in the box.  
 b. She is in love.  
 c. Ok, class, put your chairs in a circle.  
 d. She cut the pie in half.

Each of these uses of *in* appears to convey a different meaning. In (4a) *in* appears to relate to the notion of containment by a three-dimensional LM. In (4b) *in* designates a particular state. In (4c), *in* relates to the notion of a boundary as shape, while in (4d) *in* designates that an entity is divided.

There are a number of reasons for concluding that these uses of *in* constitute related, and hence, polysemous word senses; that is, there are good reasons for assuming that the many distinct senses conventionally associated with a particular lexeme result from a motivated process.

It is perhaps self-evident that an important function of language is communication. Moreover, communication is fundamentally purposeful (Gumperz 1982). This fact places certain non-trivial constraints on the use of lexical items. It seems obvious that a speaker intending to communicate, and hence achieve the desired purpose, would not use a lexical form with one established meaning to indicate something else, unless the speaker assumed the listener could readily work out the novel usage. In order for a novel use to be readily interpretable by the hearer, meaning extension must be somehow constrained and systematic. This strongly suggests that when a speaker uses a form with an established meaning to indicate something other than the conventional meaning, the choice of which lexical item to select is motivated. If this were otherwise, the speaker could not assume that the listener had a reasonable chance of interpreting the novel use. This line of reasoning suggests that there must be something about the conventional meaning associated with the lexical item that led the speaker to choose that lexical form rather than some other.

Moreover, it is reasonable to assume that at an earlier stage in the language, a form such as *in* had fewer distinct, conventionalised meanings associated with it<sup>3</sup>; thus, many of the uses now conventionally associated with the form at one point represented novel uses. The homonymy approach begs the question of why it should be the case that a speaker would choose to use a particular established form in a novel way, rather than coining a new phonological string altogether.

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3. This point is also made by Sweetser (1990).

Given the argument we have been developing, the synchronic semantic network associated with a lexical item is understood as a historical product. This contrasts with the traditional view, which assumes that the lexicon is the repository of the arbitrary and the idiosyncratic and hence that distinct meanings within a semantic network are arbitrarily related. As a result, the homonymy approach makes the implicit claim that the process of meaning extension itself is arbitrary, leading to the unsatisfactory conclusion that language change is *ad hoc*, lacking motivation. This contradicts the view that language evolution is a systematic process, as revealed by the voluminous grammaticalization literature (e.g., Bybee *et al.* 1994; Hopper and Traugott 1993; Heine *et al.* 1991 for overviews, summaries and references).

Finally, the homonymy approach fails to explain the ubiquity of the phenomenon of meaning extension. While we readily acknowledge that the “accidents” of history have resulted in instances of homonymy, the failure to account for the considerable systematicity that does exist misses important generalisations. As the homonymy approach fails to recognize that distinct meanings may be motivated and, hence, at some level systematically related, we are forced to conclude that it is inadequate.

### 3.2. The actuation issue

In view of the proliferation of distinct senses associated with a lexical item such as *in*, the actuation issue concerns accounting for the cause(s) of such a proliferation. We propose an experientialist view, suggesting that in our interaction with the socio-physical environment, certain spatial relations have non-trivial consequences, which in turn give rise to situated inferences. For instance, by virtue of a TR being within a container, the TR is thereby located with surety. For example, if you move a coffee cup, the coffee moves with the cup (unless, of course, you spill the contents). Hence, in this instance containment correlates with location. It has been observed by a number of scholars that situated inferences deriving from experiential consequences, through continued usage, come to be conventionally associated with the lexical form identified with the situated inference (e.g., Bybee *et al.* 1994; Evans To appear; Hopper and Traugott 1993; Fleischman 1999; Svorou 1994; Traugott 1989; Tyler and Evans 2001, 2003).

Following Traugott, we term this process *pragmatic strengthening*. This process results in the association of a new meaning component with a particular lexical form through the continued use of the form in particular contexts in which the situated inference results. That is, new senses derive from the conventionalisation of inferences through usage patterns.

By way of illustration, consider the following examples:

- (5) a. She is in the prison.  
 b. She is a prisoner.  
 c. She is in prison.

The sentence in (5a) designates a scene in which the TR, *she*, is located in a particular bounded LM, *prison*. The purpose of bounded LMs of this kind is to restrict the freedom of the inmates. Hence, the state of being a prisoner, described in (5b), is tightly correlated in experience with being located within a particular kind of bounded LM. Thus, it is the context itself (via inference and our knowledge of the real world) which provides the implicature of a particular state being associated with a particular bounded location. If an experientially-motivated inference is recurring, it can be reanalysed as distinct from the scene of which it is a part. Through continued use, this process may lead to the strengthening or conventionalisation of the inference, resulting in its development as a distinct meaning component associated with the lexical form with which it is related, i.e. *in*. As a consequence, *in* has, in addition to its “containment” meaning in (5a), a conventional State Sense associated with it, as illustrated by (5c). Indeed, this sentence could be applied to a prisoner outside the prison on day release, while (5a) could not.

Once instantiated in semantic memory this additional sense can be employed in new contexts of use unrelated to the context that originally gave rise to it. Thus, *in* has developed a conventionalised State Sense where the original spatial configuration which initially gave rise to the situated implicature is no longer required, as evidenced by examples of the following kind which employ an abstract LM:

- (6) a. We’re in a state of war/emergency/holy matrimony/martial law/anarchy.  
 b. She looked peaceful in death.  
 c. They’re always getting in trouble.



### 3.3. The modelling issue

The Modelling issue concerns how the (synchronic) polysemy exhibited by a particular lexeme should be modelled. Following scholars such as Lakoff (1987) and Taylor (2003) and the results of psycholinguistic studies such as Rice *et al.* (1999) and Sandra and Rice (1995), we will assume that lexical items constitute lexical categories, consisting of form-meaning pairings. The semantic pole of the form-meaning pairing we model in terms of a semantic network, organised with respect to a primary or sanctioning sense. Our sanctioning sense constitutes the synchronic sense which language users intuitively feel best constitutes the “most central” meaning associated with a particular lexical item (discussed further below). However, as the historically earliest attested meaning may still play an active part in the synchronic network associated with a preposition such as *in*, the historically earliest sense and the sanctioning sense may overlap.<sup>4</sup>

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4. In terms of synchronic polysemy networks, the empirical work by Sandra and Rice (1995) suggests that it may not be the case that a particular lexical form has a single sanctioning sense by virtue of which language users categorise all other senses associated with a lexical item. Thus, their empirical work raises questions concerning the view that we can define polysemy as a strictly synchronic phenomenon in which there is a relationship which speakers are consciously aware of holding between distinct senses of a particular lexical form. This is an empirical question for which we do not yet have sufficient evidence to address. If extensive experimental evidence shows that language users systematically and consistently fail to perceive some senses as being related, then we must call into question that what we are terming polysemy constitutes a phenomenon that is wholly synchronic in nature. While we believe all the senses in a particular semantic network are diachronically related, in terms of the adult lexicon, there may be differences in the perceived relatedness between distinct sets of senses, due to routinisation and entrenchment, obscuring the original motivation for the derivation of senses from pre-existing senses such as the primary sense for language users (see Rice *et al.* 1999, in particular). Hence, one of the reasons we term our approach *principled polysemy* is to reflect the view that due to processes of language change, not all senses associated with a particular phonological form may be recognised by a language user as being synchronically related. That is, while meaning extension is highly motivated, it may result in a semantic network, which may appear, to the language user (and perhaps also the linguist), to be only partially motivated.

The idea behind positing a primary or sanctioning sense is that language users appear to intuitively categorise senses with respect to some lexical “model” or lexical “theory”.<sup>5</sup> A word’s semantic network, i.e. the range of conventional senses associated with it, can be modelled or organised with respect to the sanctioning sense. As we will diagram the semantic network for *in* as a radial-like structure (see Section 4), we will follow the practice of referring to semantic networks organised with respect to a sanctioning sense as a *radial category* (Lakoff 1987). One advantage of modelling a lexical category in terms of a radial category is that this facilitates understanding degrees of relatedness between senses, and accounts for the appearance of *chaining* within categories (see Lakoff 1987). That is, while some senses will appear to be more closely related to the sanctioning sense, other senses may appear to be more closely related to other derived senses. This pattern of clustering suggests possible paths of derivation (see Tyler and Evans 2001), and provides predictions that can be assessed against what is known about the diachronic development of word senses from the historical record.

In spite of the foregoing, we are not claiming that the sanctioning sense will necessarily be the same across a community of speakers. Patterns of entrenchment may vary from language user to language user. However, as prepositions appear to relate at some level to spatial relations, we hypothesise that the sanctioning sense associated with a particular preposition can be modelled in terms of what we term a *proto-scene*.

We will define a proto-scene (the unique sanctioning sense for a particular preposition) as a highly abstract representation of a recurring spatial configuration between two (or more) objects, a *spatial scene* (see Tyler and Evans 2003; see also Evans 2004; Evans and Green To appear). The proto-scene for *in* will be presented in the next section.

#### 4. The case of *in*

In this part of the paper we turn to a consideration of the polysemy network associated with the English spatial marker *in*. Our purpose here is quite limited, and for that reason we do not present an analysis of the entire semantic network associated with *in*. Such an analysis would necessitate a

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5. An exemplification of this is lexicographic practice, which ranks word senses, often numerically.

paper many times longer than this. Moreover, we do not seek to adduce “decision principles” for determining distinct senses or the sanctioning sense, we have presented these elsewhere (see Tyler and Evans 2001, 2003). Rather, in keeping with the theme of this volume, we present the following in order to support our contention that meaning extension in the mental lexicon, the phenomenon of polysemy, is highly motivated in nature. In specific terms we seek to show how the proto-scene gives rise – through tight correlations in experience leading to situated inferences – to derived meanings, which come to be conventionalised as distinct senses via pragmatic strengthening. That is, we are addressing what we termed the actuation issue. The semantic network for *in* has a large number of distinct senses associated with it; we have identified nearly thirty, which appear to be arranged into groupings or clusters derived from related experiences. In order to demonstrate the highly motivated nature of the process of meaning extension we will illustrate contrasting senses, which are nevertheless representative of each cluster.<sup>6</sup>

#### 4.1. The proto-scene for *in*

The proto-scene for *in* constitutes a spatial relation in which a TR is located within a LM which has three salient structural elements, an interior, a boundary, and an exterior. In addition to the spatial relation designated, the proto-scene for *in* is associated with the functional element of containment (see below) – this is a consequence of the structural elements of the LM, the fact that the TR is located within the interior portion of the LM, and the real-world force dynamics associated with containment. The proto-scene for *in* is given in Figure 1. The LM is designated by the bold lines while the TR is designated by the dark circle.

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6. *In* and its Indo-European cognates (particularly in French, Dutch and German) have been extensively studied (e.g., Dirven 1993; Hawkins 1988; Herskovits 1986, 1988; Hottenroth 1993; Lindstromberg 1998; Miller and Johnson-Laird 1976; Quirk *et al.* 1985; Vandeloise 1991, 1994). Despite having been so well studied, the present analysis represents, we suggest, the first that provides a methodologically motivated account for the range of polysemy associated with *in*.

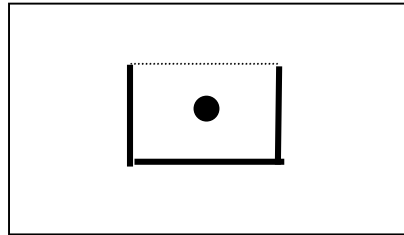


Figure 1. Proto-scene for *in*

Linguistic examples of the proto-scene include the following:

- (7) a. John is in the house.  
b. The kitten is in the box.

#### 4.2. The functional nature of containment

As intimated above, the semantics of *in* cannot be solely equated with a particular set of spatio-geometric properties. In addition, prepositions often designate a functional element (see Evans and Tyler 2004; Tyler and Evans 2003). This arises as a consequence of our continued and ubiquitous interaction with spatial scenes involving certain spatial configurations.

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 the everyday example of a coffee cup which constrains the coffee it contains to a specific location, namely the confines of the cup, 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 jeweller'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 prepositions *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 jeweller withdraws a diamond brooch from a safe. In this way, bounded LMs have source properties, as lexicalised 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 passage-way 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 prepositions cannot be equated solely with spatial elements. Consider the diagram provided in Figure 2.

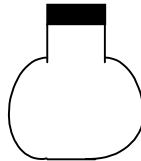


Figure 2. A bottle or a light-bulb (after Vandeloise 1994: 172)

Vandeloise observed that an image such as that depicted in Figure 2 could be construed as being either a bottle or a light-bulb. However, while we can felicitously describe the relation between *the light-bulb*, the TR, and its LM, *the socket*, as in (8),

- (8) The bulb is in the socket.

we cannot felicitously describe the relation between a bottle and its putative LM, *the cap*, in terms of the spatial relation designated by *in*:

- (9) ??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 spatial-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, “[W]hile 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 function. In contrast, the position and successful functioning of the bottle is not contingent on being *in* the cap.

#### 4.3. Non-canonical bounded LMs

Because of the flexibility of human conceptualisation *in* can be employed to designate spatial relations in spatial scenes that do not involve canonical three-dimensional LMs. For instance, in the following examples the LM is conceptualised as being physically planar, and hence two-dimensional. By virtue of such LMs being construed as possessing an interior (and thereby a boundary and an exterior), these LMs are conceptualised as bounded, licensing the use of the proto-scene for *in*:

- (10) a. The cow munched grass in the field.  
 b. The tiny oasis flourished in the desert.

In (10a) we conceptualise *the cow* as being “contained” by the field. Yet, the field is not a canonical three-dimensional LM. By virtue of a field having an interior (that part which constitutes the field), a boundary such as a track, road, fence or hedge which marks the perimeter, and an exterior (that part which is not the field), this particular spatial scene can be construed as involving a bounded LM and hence a containment relationship. It might be objected that fields containing cows and other livestock are often bounded with barriers such as gates, fences, or hedgerows which specifically constrain movement and thus this spatial scene does involve a canonical, three-dimensional LM. Notice, however, that the LM appears to be conceptualised as bounded even in examples in which there is no phys-

cal impediment delimiting movement, as evidenced in (10b). That is, by virtue of there being a LM which can be conceptualised as having an interior which contrasts with an exterior, a boundary is entailed and a concomitant designation of containment arises. Hence, in (10b), *the oasis*, the TR, is conceptualised as being “contained” by *the desert*, the LM, even though there are no physical barriers such as fences bounding the desert.<sup>7</sup>

Analogously, *in* mediates the spatio-functional relation in spatial scenes involving continents, seas, countries, regions, provinces, and other geographical divisions, such as cities, etc.

- (11) a. China is in Asia.  
b. London is the largest city in the United Kingdom.  
c. She lives in New York City.

*In* also denotes spatial scenes in which a prevailing atmospheric condition is conceptualised as *enveloping* the TR:

- (12) a. The flag flapped in the wind.  
b. The child shivered in the cold.  
c. The rabbit froze in the glare of the car’s headlights.

Other spatial scenes involving the proto-scene for *in* include examples such as the following, in which a collective of individuals is conceptualised as a single bounded entity. Consider some examples:

- (13) a. The child couldn’t be seen in the crowd.  
b. The old cottage was located in the wood.

Langacker (1987) observes that collective entities, characterised by nominals such as *crowd*, *team*, etc., profile the interconnections between the individuals that constitute the collective. Due to the perceptual phenomenon of *closure*, a collective of individuals may be conceived as constituting a single bounded entity. Moreover, in perceptual terms collectives can also be perceived as constituting single bounded entities. For instance, while up close to a crowd of people we perceive the individuals who make up the crowd. If we move away so that the collective is increasingly distant, a

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7. Of course, as deserts are relatively inhospitable, they often constitute barriers to travel, expansion of settlements, etc.

point is reached at which we perceive a bounded entity, a ‘crowd’, without perceiving the individuals who make up the crowd. Due to phenomena of this kind, collective entities such as people can be perceived and hence conceptualised as a single bounded entity, a ‘crowd’.

Once this has occurred, the LM, *the crowd*, can be construed as occupying a bounded space. Thus, such a single entity can be conceptualised as a bounded LM, possessing not only a boundary but also an interior and an exterior. Moreover, our experience of being part of a crowd often involves a number of the functional aspects of containment such as the sense of having our movements constrained, of being surrounded, of our view being obstructed, etc. Thus, the use of *in* is licensed in such situations.

#### 4.4. Beyond the proto-scene

Due to the ubiquity of bounded LMs in our everyday experience and the range and differences in such LMs, it is hardly surprising that we interact with bounded LMs in many different ways. This is reflected by the complexity of the polysemy network associated with *in*, and the range of senses associated with it. In this section we will provide a brief overview of a limited range of the senses associated with each of the five clusters of senses derived from the proto-scene. Each cluster reflects the different configurational and functional elements associated with a bounded LM, whose functional element is containment. Figure 3 presents a summary of the senses and clusters of senses in the semantic network for *in*, which we will deal with.

##### 4.4.1. *The Location Cluster (2)*

One aspect of the notion of containment relates to the movement or action of an entity being constrained by virtue of being enclosed by a bounded LM. Johnson (1987) has argued that a consequence of this imposition is that the location of a contained TR is determined by the location of the bounded LM. In other words, the bounded LM serves to locate the contained TR *with surety*. Take the example of an infant in a playpen – move the playpen and the infant thereby follows suit. Indeed, the contained TR is located with surety even if the TR is not perceptually accessible. For example, the location of the infant in the playpen is known, even if the infant



is not immediately within sight, as when the parent steps out of the room. Thus, there is a strong experiential correlation between a TR being contained and being located with surety.

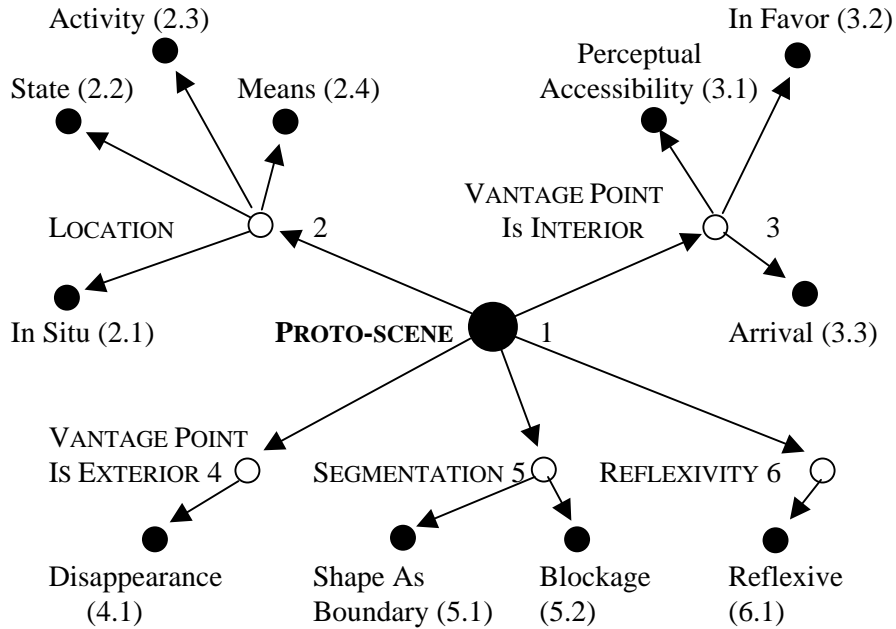


Figure 3. A Partial Semantic Network for *in* (Note: Clusters of senses are indicated by un-shaded circles. Distinct senses are indicated by shaded circles.)

Experimental work in child language acquisition (E. Clark 1973) also suggests a strong conceptual relationship between location and containment, and that young children perceive containers as default locations. In the first step of an experiment (E. Clark 1973), the experimenter asked 18 month olds to “Do this” as a block was placed in the child’s cot. The children mimicked the experimenter’s placement of the block perfectly. In the following steps, the experimenter again said “Do this” but placed the block beside the cot, then under the cot. In these conditions, the children still placed the block *in* the cot. In other words, given a moveable object, (a TR), a container (a LM), and the task of locating or placing the object, these young children seemed to construe containers as natural locators.

In the Location Cluster of senses, the notion that a bounded LM serves to pick out the salient space which contains the TR is privileged, and gives

rise to a range of closely related senses. We will briefly survey four of these: the In Situ Sense, the State Sense, the Activity Sense and the Means Sense.

**The In Situ Sense (2.1).** An experiential correlate of being located with surety is that the TR crucially remains in a particular location. The conventional interpretation that the TR remains co-located with the salient space designated by the LM for an extended period provides additional meaning not apparent in the proto-scene. Moreover, this designation suggests an attendant purpose for being so located. This sense is illustrated by the following examples:

- (14) a. What are you in for? [asked in a hospital = “What’s wrong with you?” or a prison = “What were you convicted of?”]  
 b. He stayed in for the evening.  
 c. The workers staged a sit-in.

In (14a) the TR is located at the LM (the hospital or the prison) for an extended period of time and for a particular purpose. Notice that this question would not be felicitous if the addressee were clearly at the hospital or prison for a brief visit, even though the addressee were physically located within the building, patently a bounded LM.<sup>8</sup>

In (14b), the TR, *he*, remains located at home<sup>9</sup>, rather than, for instance, going to a nightclub or some other location. In (14c) the TR, *the workers*, remain at their place of work, refusing to leave in order to protest. In each of these examples, the TR remains located for an extended period, for a particular purpose and/or due to a volitional act or event. As such, the correlation between a TR being located with surety within the LM and the TR remaining at the location in question for an extended period, an In Situ Sense has become associated with *in*.

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8. The appropriate question for the short term visitor is something like *What/Who have you come in for?* placing emphasis on the act of coming, rather than state of being **in**.

9. Lindner (1981) points out that *in* has developed a “special” sense of the TR being in the default location. For a person, we often think of the default location as the home.

**The State Sense (2.2).** Grady (1997) and Lakoff and Johnson (1999) have argued that a primary metaphor, one which is based on a common correlation in experience, involves a particular location (LM) and the state experienced by the entity (TR), or the particular situation that the TR happens to be experiencing. For instance, the infant (TR) sitting on the parent's lap, enclosed in the parent's arms (LM), will often experience a sense of security and love. Some young children experience a sense of isolation and fear when left alone in a dark room at night. Through recurring instances of a particular emotional state being experienced in a specific locale, the correlation between location and emotional and/or physical state becomes established. This correlation gives rise to conceptual associations such that we conceptualise and hence lexicalise states in terms of location.<sup>10</sup>

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10. Other spatial particles, such as *on* and *at*, can also denote State Senses. These State Senses may derive from the ubiquitous experiential correlation between states and location. However, there appear to be systematic, subtle differences in the properties of the states denoted by each preposition and thus, in many cases, we can identify the motivation for conventionalised uses of particular prepositions with particular states. For instance, an important motivation for conventional uses of *in* seems to relate to the constraint in extracting oneself from or placing oneself in the state, i.e. State Sense uses of *in* often draw on the notion of containment. For instance, English speakers seem to conceptualise an emotional state such as love in such a way that once one is "in" love, one cannot easily or voluntarily leave that emotional state; similarly, once one is "out of" love with a particular person, it is difficult to get back "in" the state of being in love. Similarly, if one is "in trouble", it is often a state not easily escaped. In contrast, states such as being "on the take" or "on the pill" are often seen as being a choice, and hence potentially more easily "escaped". This is coherent with the proto-scene for *on*, which does not involve boundaries or constraints on motion. Moreover, the State Sense denoted by "on" often involves some sense of support, which is also coherent with the proto-scene. Analogously, the use of "at" in a State use such as "at war" may be due to the oppositional sense associated with "at", e.g., *He rushed at me*. We suggest that the meanings associated with these examples reflect nuances from a number of senses designated by each preposition, which is expected if a semantic network is a semantic continuum. Thus, although we hypothesise that all State Senses are motivated by the correlation between location and state, we also suggest that there are nuances, such as "boundedness" or "constraint", associated with uses, such as "in love", "in trouble", etc., which relate to the semantic network for the particular preposition in question.

As noted earlier (recall the examples in (5) and the related discussion), *in* can be employed with certain states which are conceptualised as constraining the TR or posing difficulty in leaving, or with situations which can be conceptualised and hence lexicalised as states, e.g. *We're in a state of war/emergency/holy matrimony/martial law/anarchy*, etc. The reason for this is that there is a tight correlation between being located in a bounded LM and a particular state which is conferred by virtue of being so located.

A consequence of the State Sense being instantiated in permanent memory is that *in* can denote relations between TRs and non-physical LMs. This is because in this sense *in* denotes relations between TRs and states, rather than bounded LMs per se. This follows as once a particular sense is instantiated in memory it can be employed in contexts of use absent those that originally motivated it.

**The Activity Sense (2.3).** In addition to the tight correlation between bounded LMs and states, noted in the foregoing, there is a similarly tight and ubiquitous correlation between a particular activity and the bounded LM in which the activity occurs. For instance, a the position of a staff person who works for a government official might conceivably be described in the following way in response to a question as to the TR's profession

- (15) A: What's his line of work?  
 B: He's in the governor's office. [=works for the governor]

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However, in some contexts more than one spatial preposition might conceivably constitute a 'best-fit'. Accordingly, while two particles may be motivated, a language or dialect may choose to conventionalise one while another may conventionalise another. An example of this is the distinction between British and American speakers. One of us is American and the other British. For the speaker of American English it feels "more natural" to describe the situation in which a female dog is fertile as: *The neighbor's dog is in heat*. For the speaker of British English it feels "more natural" to describe the same situation as: *The neighbour's dog is on heat*. Indeed, both particles are motivated. A state of "heat" is relatively-speaking short, hence *on*; yet the animal cannot voluntarily escape this state, thus motivating the use of *in*. Hence, while both *in* and *on* are motivated, in this context which one is selected is a matter of conventionalisation.

This example nicely illustrates the correlation between an activity and the bounded LM at which the activity takes place. Working for the governor takes place in a bounded LM referred to as the governor's office(s). Hence, the location can stand metonymically for the activity.

A consequence of the correlation between activities and bounded LMs is that the notion of an activity can come, through pragmatic strengthening, to be reanalysed as a distinct meaning associated with *in*. Once instantiated in semantic memory, *in* can mediate a relation between a TR and an activity even when the activity designated is no longer overtly associated with a particular bounded LM. Consider some illustrative examples of the Activity Sense:

- (16) a. He works in stocks and shares.  
 b. She's in medicine.  
 c. They are in [the manufacture of ] expensive baby clothes.  
 d. She's in graduate school.<sup>11</sup>

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11. At this point it is worth contrasting the principled polysemy approach to the conceptual metaphor approach. In their early study of conceptual metaphors, Lakoff and Johnson (1980: chapter 7) suggested that in an example such as: *She's in love*, what they termed an ontological metaphor licensed the use of an "abstract" concept, such as love, being conceptualised as a container. The present approach suggests that it may be misleading to posit that a native speaker is somehow understanding a concept such as love as a bounded LM which physically contains the TR. Rather, due to a complex semantic network, *in* has associated with it a conventional State Sense, which licenses such uses. This sense, while conventionally associated with *in*, is derived ultimately from a tight correlation in experience between spatial regions, which are conceptualised as being bounded, and states (see Grady's 1997 ground-breaking work on experiential correlation). Hence, while states are not straightforwardly conceptualised as three-dimensional containers, as is sometimes implied in the conceptual metaphor literature, it is worth emphasizing that the present principled polysemy approach does maintain that the polysemy associated with *in* (and with other spatial particles) is firmly grounded in spatio-physical experiential correlates.

While we hypothesise that once distinct senses are conventionalised, they no longer straightforwardly draw on the experiential correlations that gave rise to them, these same experiential correlations, as well as coherent perceptual resemblances, are still an active part of human experience and, hence, remain available for the creation of novel utterances. Moreover, we acknowledge Lakoff and Johnson's (1980) important insight that metaphorical patterns tend to be consistent or coherent throughout the language. The fact that emotional

**The Means Sense (2.4).** As we have just noted in the foregoing discussion, locations and activities are strongly correlated in experience. One result of the conceptual association established between activities and locations is reflected in the lexical pattern of expressing aspects of activities with the particle *in*. Moreover, it is often the case that a particular activity utilises one (or more) particular means in order to be accomplished. Due to the tight correlation in experience between an activity and the means of accomplishing the activity, *in* has developed a distinct Means Sense. This has been possible precisely because *in* had an antecedent Activity Sense associated with it. Consider some examples of the Means Sense.

- (17) a. She wrote in ink.  
b. He spoke in Italian.

In (17a) *in* denotes the relation between a particular activity and the means of accomplishing the activity, ink versus pencil, for instance. Similarly, the activity in (17b) is accomplished through the medium of Italian rather than Japanese, say.

The correlation between activities and their means of accomplishment has led, then, through pragmatic strengthening to the development of the Means Sense. This provides an elegant illustration of the way in which a preposition, through the development of conventionalised senses (e.g. the Activity Sense), and recursive experiences correlating with these derived senses (e.g. activities correlate with means of accomplishment), can give rise to further senses (e.g. the Means Sense).

In addition, the means used to accomplish an activity can be conceptualised as crucially influencing or constraining the activity. This conceptualisation is coherent with the notion of containment present in the proto-scene for *in*. Returning to the example in (17a), the activity of writing is constrained by the means used to accomplish the writing, i.e. by the writer using ink. For instance, the writing is not easily erased so the writer must take certain additional care in the process.

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states and atmospheric conditions are both associated with a bounded region and that emotional states are conceptualised (through perceptual resemblance) as weather conditions, as in *They're in a stormy relation* or *She's in a bright, sunny mood*, form a coherent, reinforcing pattern of conceptualisation.

#### 4.4.2. *The Vantage Point is Interior Cluster (3)*

Up to this point, the spatial scenes associated with *in* that we have explored have all assumed an “off-stage” vantage point. However, there are spatial scenes in which the vantage point can be located “on-stage”, i.e. within the spatial scene being conceptualised. This has profound implications for how the scene is viewed and, consequently, for senses derived from such a viewing arrangement (see Langacker 1987). In spatial scenes involving a bounded LM, one obvious vantage point is interior to the bounded LM. The interior vantage point gives rise to a number of distinct senses, one of which we detail below: the Perceptual Accessibility Sense.

Following work by discourse analysts such as Schiffrin (1992), we hypothesise that taking the interior perspective can coincide with a shift in deictic centre of the scene (what we are terming the vantage point). Taking the interior region as the vantage point concomitantly highlights the perspective of the TR. In this section we also discuss two further senses, the In Favour Sense and the Arrival Sense, in which the TR within the interior region is the vantage point from which the scene is viewed. Hence, while in the Perceptual Accessibility Sense the vantage point is within the bounded LM but distinct from the TR, in the In Favour and Arrival Senses, the vantage point and TR coincide.

**The Perceptual Accessibility Sense (3.1).** A consequence of the experiencer and vantage point being located within a bounded LM is that TR(s) and interior environment contained by the LM are available to the experiencer (and hence vantage point) by virtue of his or her sense-perceptory apparatus. Take vision for instance. Unless we possess X-ray vision *à la* Superman, for the contents of a bounded LM (such as a closed room) to be visible to us, we must ordinarily be located within the bounded LM. This is a significantly different occurrence than that which takes place when the experiencer is located outside the bounded LM. When the experiencer is located exterior to the bounded LM, the interior region and TR(s) tend not to be accessible. At the same time, when the experiencer is located interior to the bounded LM, the limits of the LM and the limits of perceptual accessibility tend to coincide. For instance, if we are in a room, all we have visual access to is in that room. Again, this reflects a substantially different consequence from being located exterior to the LM. Due to the tight correlation between the construer being located within the bounded LM, and the TR and interior space delimited by the bounded LM being available to

the experiencer, in sense-perceptory terms such as visibility, *in* has derived a Perceptual Accessibility Sense. Consider some examples:

- (18) a. I have it in view.  
 b. I have him in sight.  
 c. I stayed (with)in earshot of baby Max’s cry.  
 d. Thoreau always stayed in range of his mother’s dinner bell.  
 e. Susan always tries to stay in touch.

In the sentences in (18), *in* denotes a relation between a TR and sense-perceptory availability with respect to a particular experiencer (= the vantage point). Notice that the sensory perception which is available is delimited by the LM, the bounding element. We suggest that this linguistic coding reflects the lived experience of the boundaries of the LM placing limits on perceptual accessibility when the experiencer is located interior to a bounded region.

It might be objected at this point that some things are literally *in* the visual field, for instance, while others are not. That is, the field of vision has certain natural limits, due to human physiology, and the nature of the physical properties of the environment. On this view, vision is naturally bounded, i.e. there is a delimited region of space we can see in any given moment, and hence the use of *in* to mediate the visual field represents the use of the primary sense for *in*, without requiring a distinct Perceptual Accessibility Sense. From this “common-sense” perspective it might appear, on first inspection, that it is erroneous to posit a distinct Perceptual Accessibility Sense associated with *in*.

However, while human sensory perception may be limited, a limit does not necessarily entail a three-dimensional bounded LM. For instance, when we look into the sky, while our visual apparatus allows us to see only so much, there is a lot beyond our vision. While we conceptualise that limit as a boundary, the boundary does not veridically exist. We suggest that the reason we conceptualise the limits of our physical perceptions as a three-dimensional container (a bounded LM) is because of experiences of being located inside three-dimensional containers with physical walls (like rooms), which obviously place additional limits on our ability to use our sensory perception organs to their fullest potential. Moreover, this tight experiential correlation is reflected in the linguistic system not only by the particular prepositions which are used to denote the limits of our perceptual access (*in* and *out*), but also by the nouns which are used, e.g., *field* (as



in *field of vision*, *visual field*, etc.), which is often conceptualised as a bounded LM, and *range* (as in *range of vision*, *the visual range*, *He's out of range*, etc.), meaning here something like 'limits', which is clearly associated with boundaries and bounded LMs.

**The In Favour Sense (3.2).** The notion of being *in* has come to be associated with being valued or considered privileged. We hypothesise that the In Favour Sense derives largely from the tight correlation between gaining access or entry to certain kinds of bounded LMs and the desirability of the event or activity within the confines of the bounded LM. For instance, we form queues to gain access to a whole host of venues on a regular basis. We must wait in a queue to gain access to the cinema to see the latest blockbuster on the first day of release, or for tickets to enter a theme park, a sports stadium, or when waiting for a free table in a packed restaurant. Entry to a whole host of such venues is often by no means guaranteed, precisely because the activities inside are desirable and thus sought after. Hence, to gain access is to be in a favourable or privileged position. Due to the tight correlation between being within the LM, and hence being in a favourable position, *in* has developed an In Favour Sense.<sup>12</sup>

To make this point consider the following example:

- (19) He managed to get in the stadium, even though places were limited.

In this example, which relates to the proto-scene, there is an implicature that being *in*, with respect to the bounded LM, the stadium, is to be in a favourable position. Through pragmatic strengthening this implicature has

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12. In addition, items that are valuable are often kept in containers to protect them. Hence, this sense while emphasising the inclusion status of the TR(s) may also draw upon our understanding that containers serve as a means of protecting items from potential externally-originating harm, as when currency, jewels, and other valuable items are locked in safes, containers par excellence, which are meant to act as impenetrable barriers in order to protect their contents.

Our understanding of human intentions leads us to infer that a primary motivation for placing items in a safe container is because those items are positively valued. Accordingly, in this sense, *in* designates the notion of an entity or an activity being valued or judged as positive in some way. Through pragmatic strengthening, the implicature of value associated with *in* has given rise to a conventionalised In Favour Sense.

come to be reanalysed such that *in* designates the notion of an entity being valued or judged as positive in some way. Consider some examples of this sense:

- (20) a. He's in (with the boss).  
b. She's part of the in-crowd.

In these examples, *in* clearly denotes relations with other people, which seem closely associated with being In Favour. However, this sense of *in* is not limited to human relations as evidenced by the following:

- (21) a. Turbans are in (this season)!  
b. That's the in-joke this week.

In these examples, *in* has the interpretation of 'favourable' or 'privileged'.

Clearly the use of *in* to designate a favourable or positive meaning element is distinct from the previous senses discussed. As evidenced in the examples in (21), this sense is apparent in contexts that no longer relate to the original context of use, i.e. with LMs that cannot be construed as bounded. This strongly supports the view that this is a distinct sense instantiated in semantic memory.

**The Arrival Sense (3.3).** In many spatial scenes in which the experiencer is located within a bounded LM, a TR at one point located outside the LM undergoes locomotion such that it comes to be located within the LM, as when a train, for instance, pulls into a train station. From the perspective of an experiencer located interior to the LM, the TR is perceived as moving closer to the interior vantage point. This gives rise to an implicature of arrival. This notion of arrival has become instantiated in semantic memory as a distinct sense, as evidenced by the following:

- (22) The train is finally in.

In this sentence, not only is the TR, *the train*, within the bounded LM, the train station, but it has arrived, as attested by the following which represents a close paraphrase:

- (23) The train has finally arrived.

Moreover, this sense is attested in verb-particle constructions such as the following:

(24) He reeled the fish in.

In this example, *to reel the fish in* reflects drawing the fish towards the angler such that it comes to be proximal with the fisherman. While the fisherman may then place the fish in a bucket, for instance, which is a bounded LM, the use of *in* in *reel in* relates to the notion of coming towards and thus arrival, rather than specifically designating a particular bounded LM. As such, we suggest that examples such as (22) and (24) relate to a distinct meaning component of arrival associated with *in*. This meaning component is also apparent in sentences such as: *She clocked/punched in at work*.

#### 4.4.3. *The Vantage Point is Exterior Cluster (4)*

Another common position from which bounded LMs are viewed is one in which the experiencer (and hence the vantage point) is located exterior to the LM. Spatial scenes of this kind give rise to a number of distinct senses subsumed under what we will term the Vantage Point is Exterior Cluster. Here we will briefly consider what we term the Disappearance Sense.

**The Disappearance Sense (4.1).** The nature of many physical entities with an interior is that they are made of opaque substances and thus the boundary of the LM often obstructs the observer's view of the interior and hence the contents. Certainly many of an infant's earliest experiences with bounded LMs – LMs which possess interiors – would be of not being able to see the contents contained by such LMs. Food put into a care-giver's mouth cannot be seen, neither can toes and feet put into socks, toys put into cupboards, people moving to a different room, and so forth. Interestingly, nine month-old infants perform better on object-hiding tasks when the occluder consists of an upright and hence prototypical container (Freeman, Lloyd and Sinha 1980; Lloyd, Sinha and Freeman 1981). Freeman *et al.* suggest that this superior performance with containers as occluders provides evidence that these infants have established a concept of containers as places where things disappear and reappear.

We suggest that due to the tight correlation between LMs with interiors and occlusion, *in* has come to be reanalysed as having a distinct Disappearance Sense, as evidenced by the examples given below:

- (25) a. The wine quickly soaked in.  
 b. Angela rubbed in the lotion.  
 c. The sun has gone in. / The sun is in.

The reasons for thinking that examples such as these evidence a distinct Disappearance Sense are as follows. First, a meaning of disappearance is not evident in any of the other senses associated with *in*. Second, the examples in (25) are context-independent. That is, they cannot be predicted based on any of the other senses for *in* considered. After all, in (25a) the wine is being absorbed by what appears to be a solid element with no discernable internal spaces (at least to the naked eye). Similarly, when we say in (25b) that *Angela rubbed in the lotion*, the lotion is not entering the skin, only to be free to leave again. The skin is not being conceived as an entity with interior space. Rather, in all these examples, the correlation between containment and disappearance, from the perspective of a vantage point exterior to the container, is that *in* derives a Disappearance Sense which can come to be used in contexts unrelated to the original context which motivated this sense in the first place.

Moreover, it is worth pointing out, at this point, that by acknowledging that spatial scenes can be viewed from different vantage points, we have a straightforward explanation for why *in* has senses which are near opposites, the Perceptual Accessibility Sense and the Disappearance Sense.

#### 4.4.4. *The Segmentation Cluster (5)*

An important aspect of bounded LMs is the notion of a boundary, which in part distinguishes interior from exterior. In this cluster of senses, the notion of segmentation or boundedness is privileged. A salient aspect of spatial scenes involving bounded LMs is that they serve to partition the environment, providing a physical means of separation and delimitation. Consider the following sentence:

- (26) The farmer put the seed in a sealed box for next year.

In this sentence, which is consistent with the proto-scene by virtue of being in a sealed box, the seed is protected from external forces and effectively separated from other seed. In a sentence such as (27), which is also consistent with the proto-scene,

(27) The prisoner was locked in his cell for 23 hours a day.

the LM acts as a container serving to restrict the prisoner's, the TR's, movement and, hence, separates the TR from other members of society. Thus, an important and frequent inference associated with the proto-scene of *in* involves the interpretation that bounded LMs effectively partition and segment that which is inside from that which is outside. We will survey two senses subsumed under this cluster: the Shape As Boundary Sense and the Blockage Sense.

**The Shape As Boundary Sense (5.1).** Langacker (1987) noted that the shape of an object is almost certainly part of our mental representation of that object. Since the shape of a bounded LM is necessarily closely related to its boundaries, it is not surprising that *in* has come to designate a relation in which the shape of the LM constitutes both the entity and the boundary. In the Shape As Boundary Sense, the TR constitutes part of a delimited configuration forming a shape. Consider the following example:

(28) Ok, class, put your chairs in a circle.

This utterance is not typically interpreted as a command to place the chairs inside a circle drawn on the floor. Rather, its interpretation has to do with arranging the chairs such that they form a circle shape, in other words, the arrangement forms a boundary that delimits a circle. Other examples that evidence this sense include the following:

(29) a. If fire breaks out get in single file before leaving.  
b. Can you get in line.

We suggest that since a salient aspect of a bounded LM is its boundary, the use of *in* to relate a TR and a bounded LM thereby highlights a salient aspect of bounded LMs. Through pragmatic strengthening *in* has derived a Shape As Boundary Sense.

**The Blockage Sense (5.2).** One consequence of being located within a bounded LM is that the boundary can serve to prevent the TR from moving beyond the LM. This situation is evident in the following sentences which appear to derive from the proto-scene but which have the implication of blocking the movement of the TR out of the LM.

- (30) a. Oxygen must be held in a sealed container (to keep it from escaping into the air).  
 b. In some ancient cultures, live slaves were sealed in tombs with their dead masters.

This notion of blockage or constraint on movement has become conventionally associated with *in*, as evidenced by the following:

- (31) a. When I got back to my car, someone had boxed/blocked me in.  
 b. In the northern territories you can get snowed in for months.

In both of these examples, rather than being contained by the LM, an entity's movement is obstructed or blocked in some way. This notion of blockage is denoted by *in*. In (31a), the speaker's car is the TR which is blocked from moving by the placement of another vehicle. In (31b), the TR is people who are blocked from moving because of the barrier created by the snow.

In addition to the foregoing, there also appears to be a second type of experiential correlation which may motivate the Blockage Sense. Here the bounded LM typically facilitates or is associated with passage. If the TR is sufficiently large it may fill or obstruct the LM hence preventing passage. Consider the following examples which are consistent with the proto-scene.

- (32) a. We couldn't move the car because a fallen tree was in the driveway.  
 b. The portly gentleman got a fishbone lodged in his throat.

As noted, in these examples the LM is conceptualised as a passage, usually a relatively empty space, which is being blocked by the TR. The implicature of blockage apparent here appears to have also contributed to the Blockage Sense associated with *in*. For instance, this notion of blockage is illustrated in the following examples:

- (33) a. There's a bad accident in the roadway with traffic backed up to the Wilson Bridge.  
b. The rock is in my way.

In these sentences there is a Blockage meaning associated with *in*. That is, *in* does not relate to containment but rather to a constraint on movement. This is strongly suggestive that there is a distinct Blockage Sense conventionally associated with *in*.

#### 4.4.5. Reflexivity (6)

**The Reflexive Sense (6.1).** In her study of verb particle constructions (VPCs), Lindner (1981) noticed that some spatial particles have a reflexive meaning element associated with them. *In* is such a spatial particle. After all, in many everyday interactions with bounded LMs, such as crushing a box or a plastic coffee cup, when the sides of the container move inwards they eventually come to occupy what would have originally been the interior space and the position canonically occupied by the TR. Crucially then, *in* mediates a spatial relation between the same entity at two temporally discontinuous points. Clearly, the boundary of a particular LM cannot simultaneously occupy two different locations at once. Yet, in the Reflexive Sense the same entity is conceptualised as constituting the TR and the covert LM (i.e. the LM is contextually understood rather than being linguistically encoded). As with other spatial Reflexive Senses (e.g., see the discussion of the Reflexive Sense for *over* in Tyler and Evans 2001, e.g., *The fence fell over*), this sense represents a sequence of events rather than a single event. Two consequences of the boundary of the LM moving inward are that i) the LM loses its original shape and ii) the original interior space no longer exists as interior space. Not surprisingly, the Reflexive Sense is often associated with collapsing and destruction of the LM and the contents. Consider some illustrative examples of the reflexive sense associated with *in*:

- (34) a. The walls of the sandcastle fell in.  
b. The house caved in.

## 5. Conclusion

In this paper we have argued against the traditional view which treats the lexicon as being the repository of the arbitrary and the idiosyncratic. A consequence of this received position is that lexical items are arbitrarily related, resulting in a homonymy view of word meaning. Our purpose in this paper has been to suggest that the lexicon is systematically motivated. In particular, we have suggested that there are three ways in which the traditional view fails to account for the linguistic behaviour of natural language, and which a motivated theory of word-meaning must account for. These constitute 1) the fact that a word can take on new meanings in novel contexts, 2) the fact that words appear to be polysemous, and 3) the fact that a single word can appear in a range of different lexical classes. The linguistic facts force us to conclude that, rather than being arbitrary and lacking in systematicity, lexical structure and organisation is in fact highly organised, achieving a particularly clear indication of a motivated system in the process of meaning extension. We illustrated the central claim that meaning extension is a highly motivated process, grounded in spatio-physical experience, with an analysis of the English lexeme *in*. This study therefore provides insight into i) the non-arbitrary quality of the mental lexicon, ii) the highly creative nature of the human conceptual system, and iii) the fact that the way we experience renders spatio-physical interactions meaningful, which in turn gives rise to emergent conceptual structure.

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