Prefixes of Spatiality in English: A Study in Cognitive Linguistics

Zeki Hamawand

The University of Kirkuk, Iraq

Abstract—The remit of this paper is to investigate the role of prefixes of spatiality in the formation of words. To do so, it adopts two approaches. Theoretically, it adopts Cognitive Semantics (CS) and tries to substantiate some of its tenets with reference to prefixation. One tenet is that linguistic items are meaningful. On this basis, it argues that prefixes of spatiality have a wide range of meanings that gather around a central sense. Another tenet is that the meaning of a linguistic item is best understood in terms of the domain in which it is embedded. On this basis, it argues that prefixes of spatiality form a set which highlights not only similarities but also differences. A further tenet is that the use of an expression is governed by the particular construal imposed on its content. On this basis, it argues that a derived word is used relative to the particular construal the speaker chooses to describe a situation. Empirically, it adopts Usage-based Linguistics, and tries to substantiate some of its prmises with reference to prefixation. One premise is that knowledge of language is derived from language use. Another premise is that the linguistic system is shaped by actual data. A further premise is that structure and substance are tightly linked.

Index Termss—category, collocate, construal, domain, perspective, rivalry

I. INTRODUCTION

In English, one way of forming new words is by prefixation, the process of deriving a new word by means of a prefix. Nouns, for example, can be derived from roots of different syntactic categories. They can be derived from verbs as in *interact* from *act*, from adjectives as in *intertribal* from *tribal*, and from nouns as in *inter-union* from *union*. In some cases, only one word can be derived from a root, as in *interchange* from *change*. In other cases, two, sometimes more, nouns can be derived, as in *interparty/intraparty* from the noun *party*. This type of derivation is known as *morphological rivalry*, the alternation between two, or more, prefixes in deriving new forms from the same root, exhibiting phonological distinctness and semantic similarity. The scope of the present analysis covers the formation of new words by means of prefixes of spatiality, as introduced in Hamawand (2011). In this respect, some questions are posed.

The first question is: do prefixes of spatialit display multiple meanings, and if so how are the meanings related?

The second question is: do prefixes of spatiality contrast subtly, and if so what provides the basis for the contrast?

The third question is: are the resulting derivatives distinct, and if so what triggers the distinction?

To answer these questions, a new system of morphology is needed. The new system is based on two approaches: Cognitive Semantics and Usage-based Linguistics. Cognitive Semantics provides the theoretical basis for the analysis. Cognitive Semantics is chosen because it allows one to study the intricacies of linguistic structures in a coherent fashion. It is chosen because it lays emphasis on explaining linguistic structures with reference to cognitive processes. Usage-based Linguistics provides empirical support for the analysis. Usage-based Linguistics is chosen because it provides the useful tools to verify the assumptions. It is chosen because the data used are objective, the evidence presented is reliable and the findings attained are valid.

II. NEW SYSTEM

Theoretically, I adopt Cognitive Semantics as exemplified by linguists such as Fillmore (1977, 1982), Talmy (1983, 1985), Fauconnier (1985,1997), Lakoff (1987, 1990) and Langacker (1988a, 1997), among others. Cognitive Semantics is built on central tenets. One tenet is that linguistic items form networks of multiple semantic values. In this regard, I argue that prefixes have meanings of their own, give substance to the host roots, and shape the final meanings of the derivatives. A prefix forms a category subsuming all of its meanings which gather around a central sense. Another tenet is that linguistic items do not occur in isolation. In this respect, I argue that prefixes form domains which reveal their specific uses. When two rival prefixes compete for one concept, they are not in complementary distribution. A close investigation of their behaviour makes it clear they have individual meanings. A further tenet is that linguistic items are not synonymous even if they look alike. On this basis, I argue that if two rival derivatives exist, they reflect a clear distinction in use. Despite sharing the same root, they differ in terms of the alternate ways the speaker construes their common content, represented by the root, when describing a situation.

In Cognitive Semantics, the form of a derivative is therefore associated with its meaning. The meaning of a derivative is characterised in terms of two aspects: *conceptual content* and *construal*. Langacker (1997) writes: "A

semantic structure includes both conceptual content and a particular way of construing that content". *Conceptual content* is the meaning inherent in a situation. The root has a mutiple facet of content, whereas the prefix has its own which it adds to the root. The rival prefixes serve to pick out different facets of the root's content. Each of the resulting derivatives has therefore a distinct meaning. The choice is a matter of matching the meaning of the prefix with that of the root, which the speaker carries out to describe a situation.

Construal is the ability of the speaker to conceive the conceptual content in alternate ways, and choose the appropriate linguistic structures, provided by grammar, to express them. As Langacker (1991) points out: "There are many different ways to construe a given body of content, and each construal represents a distinct meaning; this is my intent in saying that an expression imposes a particular image on the content it evokes". The meaning of a derivative involves the particular construal the speaker imposes on its conceptual content. Two derivatives may invoke the same conceptual content, yet they differ semantically by virtue of the construals they represent. Derivation is then seen as the integration of the component parts to form a composite whole. It is not only a question of the form or semantics of the base, but also the result of the semantic match-up between its internal parts. Morphology is semantically motivated, and differences in morphological behaviour reflect differences in meaning.

To back up the analysis with empirical evidence, I adopt Usage-based Linguistics as exemplified by linguists like Langacker (1988b, 2000), Kemmer & Barlow (2000), Tomasello (2000), Bybee & Hopper (2001) and Croft & Cruse (2004). Usage-based Semantics hinges on some pivotal premises. One premise is that knowledge of language is derived from language use. In this respect, I argue that spatial prefixes are considered utterances, representing actual instances of use, which are produced by language users to achieve particular communicative goals. The language user's knowledge of the spatial prefixes is, therefore, based on situated instances of use. Another premise is that the linguistic system is shaped by actual data. In this respect, I argue that the contexts, in which spatial prefixes as utterances are used, are the best evidence available in accounting for their meanings. A further premise is that the structure and substance of linguistic items are tightly linked. In this respect, I argue that any spatial prefix consists of two parts which are closely tied: form and meaning. The structure of a spatial prefix resides in its phonological form. The substance of a spatial prefix resides in its semantic content. Both the structure and substance are related via language use, which is in turn influenced by experience. From this, it can be inferred that the specific form of a derivative is inseparable from its semantic organisation.

III. MORPHOLOGICAL SKETCH

The new system of morphology which the present study applies to spatial prefixation has to address two linguistic phenomena. One phenomenon pertains to *status*, the position of spatial prefixes in relation to others. In the present analysis, spatial prefixes are treated as a coherent class, a class whose members may represent the same concept but have contrastive behaviour. That is, sptial prefixes have something in common as well as something to distinguish them. The other phenomenon relates to *function*, the purpose which spatial prefixes serve. In the present analysis, spatial prefixes are assigned distinctive roles which they play in the language. That is, every spatial prefix has a separate message to convey in the language. In cases of alternation, the alternative prefixes bring about differences in the meanings of the alternative derivatives.

A. Status of Prefixes

Concerning form, a complex word consists of both a root and one, or more, prefixes. A root is a free morpheme of any word class which can stand by itself. A root is considered (i) phonologically autonomous, (ii) phonologically contentful, (iii) semantically autonomous, (iv) semantically contentful and (v) promiscuous: occasionally admissible of more than one prefix. A prefix, by contrast, is a bound morpheme that is added to the beginning of a free morpheme to form a new word. A prefix is considered (i) phonologically dependent, (ii) phonologically schematic, (iii) semantically dependent, (iv) semantically determinant and (v) choosy with respect to the root it attaches to. (Taylor, 2002) Concerning meaning, a complex word is not only compositional but also and to a large extent non-compositional in character. *Compositional* refers to the case where the meaning of a complex expression is the function of the meanings of its parts. For example, *a subnormal temperature* is a temperature that is lower than normal. *Non-compositional* refers to gthe case where the meaning of a complex expression is the function of both the meanings of its parts and the contextual knowledge surrounding its use. For example, *a subnormal child* is a child that has less than the normal level of intelligence.

B. Function of Prefixes

A spatial prefix is a word-initial element that is added to a free morpheme to form a new word. It is a bound morpheme because it never occurs by itself, but is integrated with a free morpheme. When the two morphemes integrate, they show what Langacker (1987) calls *valence* relations. *Valence* is the mechanism whereby two grammatical units combine to form a composite unit. The integration of the participating subunits in a composite unit is affected by the following four determinants. First, the two morphemes are integrated because they have certain elements in common at both semantic and phonological poles. Second, of the two morphemes the free morpheme qualifies as autonomous while the bound morpheme qualifies as dependent. In the word *intertribal*, for example, the free morpheme *tribal* is autonomous while the bound morpheme *inter-* is dependent. Third, the bound morpheme is primarily responsible for the

character of the composite structure. It acts as a *profile determinant* and has a crucial function in the derivation process. It causes a shift of a kind in the semantic structure of the root, and so adds a special meaning to the derived formation. In the word *intertribal*, for example, the bound morpheme *inter-* is the key subpart in that it lends its profile to the entire composite structure, which means 'existing or occurring between different tribes'. Fourth, the two morphemes form a head-complement structure, with the bound morpheme being the head and the free morpheme being the complement. In the word *intertribal*, for example, the bound morpheme *inter-*functions as the head, whereas the free morpheme *tribal* is its complement. In the formation, the complement adds intrinsic conceptual substance to the head.

IV. SEMANTIC SKETCH

The new system of morphology which the present study applies to spatial prefixation has to address three linguistic phenomena. One phenomenon pertains to *lexical multiplicity*, whereby spatial prefixes display a series of senses which gather around a nucleus. The senses are organised in terms of distance from the nucleus, based on the degree of similarity. Another phenomenon revolves around *lexical relationships*, whereby spatial prefixes cluster in sets defined by two types of relation: one is of similarity vis-à-vis the overall concept of the set they form; the other is of difference with respect to the specific functions they perform within the set. A further phenomenon relates to *lexical alternation*, whereby two, or more, spatial prefixes compete to derive new forms from the same bases. The resulting alternatives exhibit both phonological distinctness and semantic dissimilarity. In spite of sharing the same bases, each alternative has a distinct function to carry out in the language.

A. Category

Traditional dictionaries describe the senses of a lexical item as homonyms: items that are the same in spelling and pronunciation but different in meaning. In this way, dictionaries ignore how such senses are related to one another, or how such senses are motivated. As a result, they miss the point that the meaning a lexical item has is vital in explaining the peculiarity associated with its behaviour. To remedy this problem, Cognitive Semantics, as demonstrated by Lakoff (1987) and Taylor (1989), builds linguistic descriptions on the *category* theory. According to this theory, most lexical items are polysemous in nature in the sense of having numerous senses. A lexical item constitutes a complex network of interrelated senses. In this theory, one sense, described as prototypical, serves as a standard from which other senses, described as peripheral, are derived via semantic extensions. The senses are related to each other like the members of a family, where they share some general properties but differ in specific details. For instance, a *kitchen chair* is regarded as the prototype of the *chair* category because it possesses almost all of its features: a chair with a seat, a back and four legs. By contrast, *rocking chair*, *swivel chair*, *armchair*, *wheelchair* or *highchair* is regarded as the periphery because they possess only some of those features.

The category theory is relevant in many areas of language. In Hamawand (2003a), I applied it to the description of complementisers in English. In Hamawand (2007, 2008), I applied it to the description of prefixes. In Hamawand (2009), I applied it to the description of negative prefixes. In the present analysis, I extend its relevance to the description of the semantic structure of spatial prefixes. In this respect, I argue that a prefix forms a category of distinct but related senses. The distinct senses, which are related by virtue of a semantic network, are the result of a dynamic process of meaning extension. A prefix category is characterised by an intersection of properties that make up its members. The member that possesses most of the properties of the category and best represents it is described as prototypical. The other members that contain some, but not all, of the properties are described as peripheral. That is, the category is specified in general terms; the different members flesh out the category in contrasting ways. A member inherits the specifications of the category, but fleshes out the category in more detail. Categorisation is then a powerful tool which reveals the general properties of structures of a given kind via their relationships with one another.

In what follows, I give a synchronic characterisation of each of the spatial prefixes. Before moving to the details, a caveat is in order. In characterising the multiple senses of each prefix, I will not elaborate on all the cognitive mechanisms relating them. The characterisation comprises three steps. First, I compile a list of words containing each prefix. In this regard, I rely on the instances offered in British National Corpus. The lists are not exhaustive but numerous enough to meet the characterisation. Second, I define the multiple senses of each prefix which is based on the analyses of the examples provided. To corroborate my definitions, I use major online dictionaries on English language such as *Cambridge Advanced Learner's Dictionary*, *Merriam-Webster Dictionary* and *Oxford English Dictionary*. Third, I provide examples for each of the senses diagnosed. To strengthen the analysis, I make use of major works on derivation such as Marchand (1969), Urdang (1982) and *Collins COBUILD Word Formation* (1993).

1. ante-

A prototypical representation of the prefix *ante-* denotes order in time. It carries the sense 'prior to the time referred to by the root'. This sense comes to attention when the nominal roots are abstract. For example, *antedate* means happening before something else. Examples of other formations are (N) *ante-dawn, antemundane*, (adj) *antenatal*, etc.

A peripheral representation of the prefix *ante-* denotes order in space. It carries the sense 'in front of the place referred to by the root'. This sense comes to attention when the nominal roots are concrete. For example, *anteroom* is a small room situated before a larger room. Examples of other formations are *antechamber, antechapel, ante-church*, etc.

A graphical representation of the multiple senses of the prefix *ante-* is offered in Figure 1:
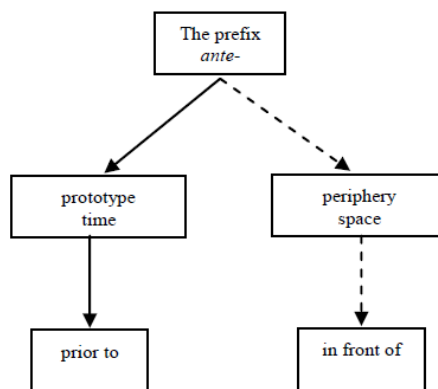
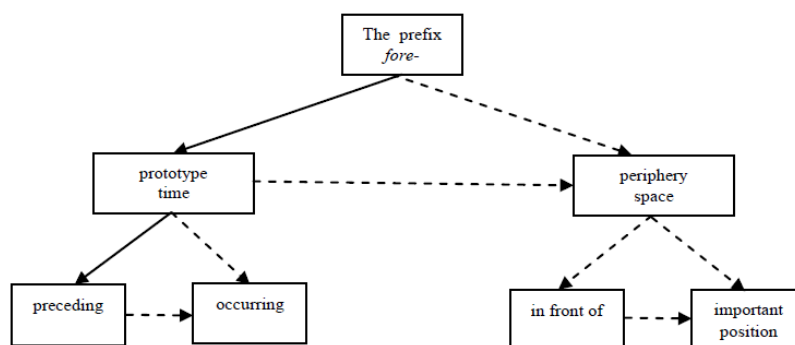Figure 1: The semantic network of the prefix *ante-*

The solid arrow represents the prototypical sense, whereas the dashed arrows represent the semantic extensions.

2. fore-

The frequent occurrence of the prefix *fore-* designates order in time. It conveys two senses. **(a)** 'preceding or leading the agent mentioned in the root'. This sense surfaces when the nominal bases are common personal nouns. For example, *a forefather* is a person (especially a man) who one is descended from, especially one who lived a long time ago. Similar nouns are *foreman, forerunner, forewoman*, etc. **(b)** 'occurring before the action mentioned in the root'. This sense surfaces when the verbal roots are transitive. For example, *to foresee* is to know about something before it happens. Similar verbs are *forejudge, forestall, foretaste, foretell, forewarn*, etc. The same is true of nouns implying action. For example, *foresight* is the act of seeing into the future. Similar nouns are *foreknowledge, forethought,* etc.

The less frequent occurrence of the prefix *fore-* designates order in space. It conveys two senses. **(a)** 'situated in front of the place mentioned in the root'. This sense surfaces when the nominal roots are concrete. For example, *foreshore* is the part of a shore between the water and cultivated or developed land. Similar nouns are *fore-chamber, forefence, foregallery, fore-hall,* etc. Some nouns refer to human body parts such as *forearm, forebrain, forefoot, forehead, foreleg,* etc. Other nouns refer to parts of a ship near the bows such as *foredeck, foremast, foresail, forestay*, etc. **(b)** 'being the most important of the position mentioned in the root'. This sense surfaces when the nominal roots are abstract. For example, *forefront* is the position of most importance or prominence, and *foreground* is the most important or prominent position.

A graphical representation of the multiple senses of the prefix *fore-* is offered in Figure 2:

Figure 2: The semantic network of the prefix prefix *fore-*

The solid arrow represents the prototypical sense, whereas the dashed arrows represent the semantic extensions.

3. inter-

In its regular occurrences, the prefix *inter-* symbolises order in space, getting two semantic niceties. **(a)** 'between the entities stated in the root'. This sense materialises when the nominal roots are concrete, denoting humans. For example, *interfamily disputes* are disputes which exist or occur between different families. Other examples are *interclass, inter-union, inter-university*, etc. The same sense applies to adjectival bases, as in *intercollegiate, inter-racial, intertribal*, etc. **(b)** 'between the places stated in the root'. This sense materialises when the nominal roots are concrete, denoting non-humans. For example, *an inter-city train* is a train that travels between cities. Other examples are *inter-canal, inter-chapter, inter-continent, inter-quarter, inter-spiral,* etc.

In its rare occurrences, the prefix *inter-* symbolises order in time, getting two semantic niceties. **(a)** 'the action stated in the root takes place reciprocally'. This sense materialises when the nominal bases are abstract, implying action. For example, *interaction* is an action that has a reciprocal effect. Other examples are *interchange, interdependence, intermediation, interplay, interrelation*, etc. The same sense applies to verbs and adjectives derived from these nouns. For example, *interdependent* means dependent on each other. **(b)** 'occurring between the time of the events stated in the

root'. This sense materialises when the nominal roots are abstract, implying non-action. For example, *interwar years* are years which relate to the period of time between the two world wars.

A graphical representation of the multiple senses of the prefix *inter-* is offered in Figure 3:
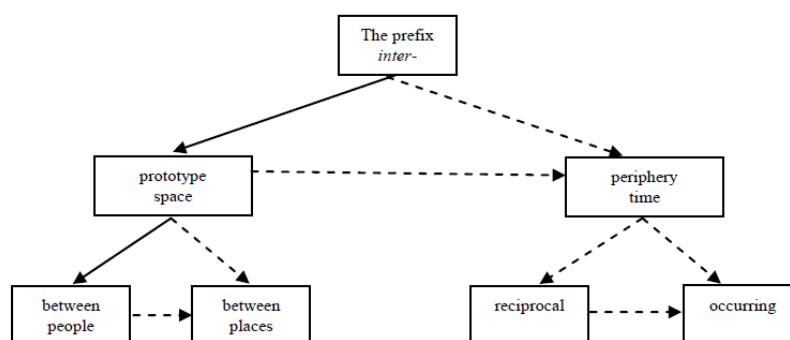

Figure 3: The semantic network of the prefix *inter-*

The solid arrow represents the prototypical sense, whereas the dashed arrows represent the semantic extensions.

4. intra-

A common sense of the prefix *intra-* underlines order in space. It bears two semantic subtleties. **(a)** 'within the entity stated in the root'. This sense realises when the nominal roots are concrete, denoting humans. For example, *intra-community trade* is trade carried out within a single community. Similar examples are *intra-state*, etc. The same sense applies to adjectival bases as in *intra-African, intra-marginal, intra-racial, intra-regional*, etc. **(b)** 'within the place stated in the root'. This sense realises when the adjectival bases are non-gradable, especially in biological terms. For example, *intracellular fluid* is fluid that is situated within a cell. Similar examples are *intrabronchial, intracapsular, intramural, intramolecular, intranasal,* etc.

A somewhat uncommon sense of the prefix *intra-* underlines order in time. It bears the sense 'during the period of time stated in the root'. This sense realises when the nominal roots are abstract. For example, *an intraday movement* is a movement which occurs during a single day.

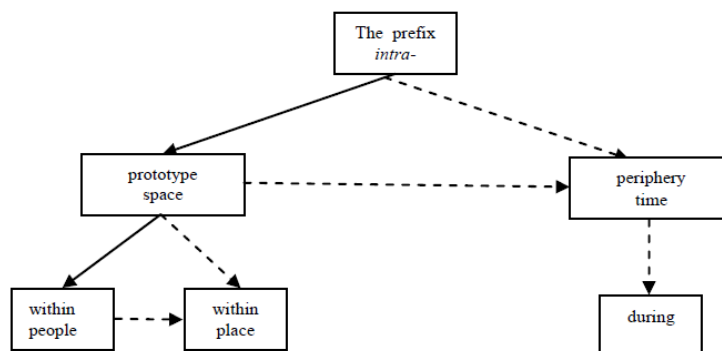A graphical representation of the multiple senses of the prefix *intra-* is offered in Figure 4:

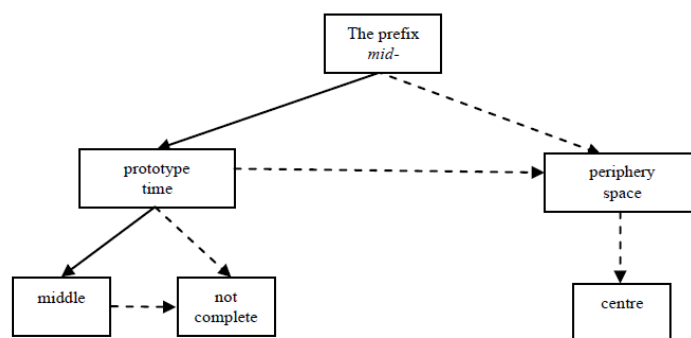Figure 4: The semantic network of the prefix prefix *intra-*

The solid arrow represents the prototypical sense, whereas the dashed arrows represent the semantic extensions.

5. mid-

The prefix *mid-* is used chiefly to denote order in time. This sense can be paraphrased in two ways. **(a)** 'the middle part of the period of time cited in the root'. This sense proceeds when the nominal roots are abstract, implying non-action. For example, *a midterm* is the middle of a political term in office, an academic calendar, or of a pregnancy. Other nouns are *mid-month, midnight, mid-May, midweek, midwinter,* etc. **(b)** 'the action cited in the root is not completed yet'. This sense proceeds when the nominal roots are abstract, implying action. For example, *a midcareer* is the halfway stage of one's career. Other nouns are *mid-flight, mid-flow, mid-prelude, mid-race, mid-stride*, etc.

The prefix *mid-* is used marginally to denote order in space. It expresses the sense 'the central part of the place denoted by the root'. This sense proceeds when the nominal roots are concrete. For example, *a mid-air collision* is a collision that takes place in the air or the sky. Other nouns are *midbrain, mid-Europe, midfield, mid-road, mid-sea*, etc.

A graphical representation of the multiple senses of the prefix *mid-* is offered in Figure 5.

The prefix *mid-*

prototype time

periphery space

middle

not complete

centre

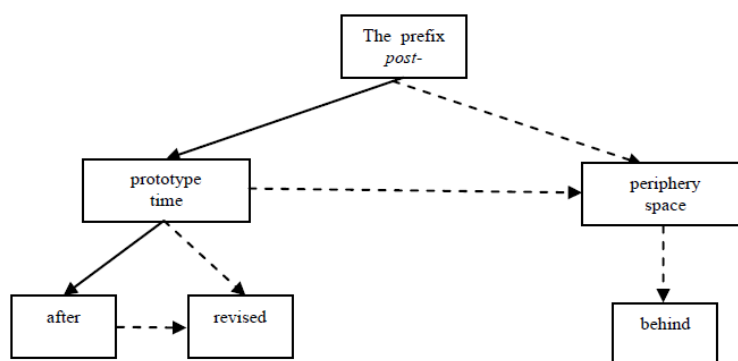Figure 5: The semantic network of the prefix prefix *mid-*

The solid arrow represents the prototypical sense, whereas the dashed arrows represent the semantic extensions.

6. post-

Primarily, the prefix *post-* is tasked with designating order in time. This sense can be restated in two ways. **(a)** 'after the period named in the root'. This sense applies when the nominal bases are abstract, implying action. For example, *post-war reconstruction* is reconstruction that happens in the period after a war. Other nouns are *post-ceremony, post-election, post-operation, post-race, post-sixth-century*, etc. The same is true of adjectival bases, as in *post-doctoral research, post-industrial society, post-natal care, post-operative complications*, etc. **(b)** 'a revised view of the theory named in the root'. This sense applies when the nominal bases are abstract, implying non-action. For example, *post-structuralism* is a philosophy that rejects structuralism's claims to objectivity and emphasises the plurality of meaning. Other nouns are *postfeminism, postmodernism*, etc.

Secondarily, the prefix *post-* is tasked with designating order in space. It means 'behind the place named in the root'. This sense applies when the adjectival bases are non-gradable. For example, *postcentral convolutions* are convolutions which are situated behind a centre. Other adjectives are *postanal groove, postocular spine, postoral segment*, etc.

A graphical representation of the multiple senses of the prefix *post-* is offered in Figure 6:

The prefix *post-*

prototype time

periphery space

after

revised

behind

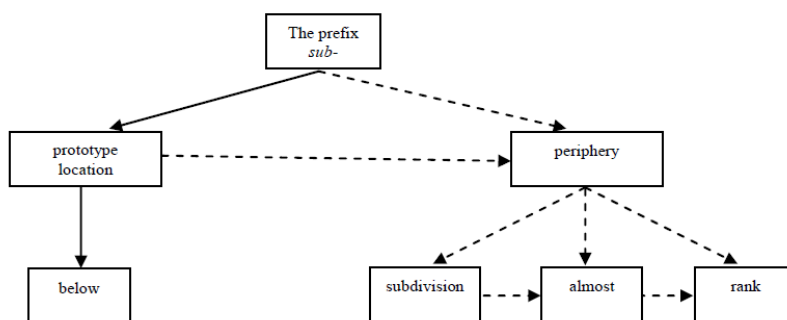Figure 6: The semantic network of the prefix prefix *post-*

The solid arrow represents the prototypical sense, whereas the dashed arrows represent the semantic extensions.

7. sub-

The sense of location is the prototype of the prefix *sub-*. It means 'below or beneath the thing named by the root'. This sense surfaces when the nominal bases are concrete. For example, *a submarine* is a vessel capable of operating below the surface of the sea. Other examples include *sub-current, sub-floor, sub-railway, subsoil, sub-structure*, etc.

The sense of degradation is the periphery of the prefix *sub-*. It acquires three particularities. **(a)** 'a subdivision of the thing named by the root'. This sense surfaces when the nominal roots are concrete or abstract. For example, *a sub-group* is a subdivision of a group. Other examples include *sub-base, sub-branch, sub-committee, sub-district, sub-title*, etc. In some formations, the bases are verbal such as *sub-classify, sub-colonise, sub-divide, sub-lease, sub-let*, etc. **(b)** 'almost or nearly the thing named by the root'. This sense surfaces when the adjectival bases are non-gradable. For example, *sub-standard goods* are goods which are less than standard in quality or size. Other examples include *sub-clinical infection, sub-fertile person, sub-literate adult, sub-normal child, sub-tropical cyclone*, etc. **(c)** 'subordinate in rank to the person named by the root'. This sense surfaces when the nominal bases are common personal nouns. For example, *a sub-dean* is a deputy or substitute of a dean. Other examples include *sub-editor, sub-governor, sub-officer, sub-treasurer, sub-warden*, etc.

A graphical representation of the multiple senses of the prefix *sub-* is offered in Figure 7:

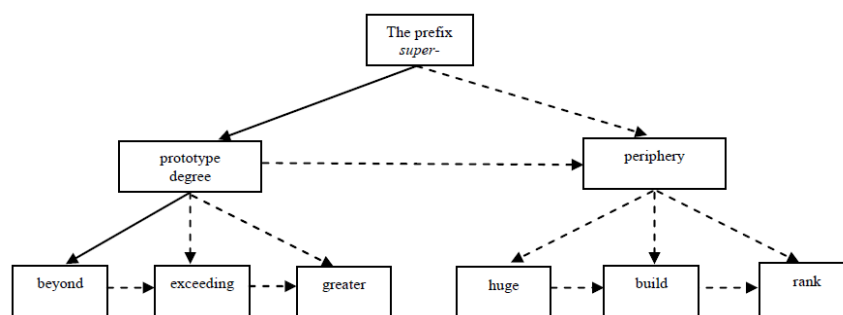Figure 7: The semantic network of the prefix *sub-*

The solid arrow represents the prototypical sense, whereas the dashed arrows represent the semantic extensions.

8. super-

The predominant sense of the prefix *super-* is one of degree. It subsumes three particularities. **(a)** 'beyond the range of the trait mentioned in the root'. This sense occurs when the adjectival bases are gradable, applying to humans. For example, *a superhuman effort* is an effort that is much greater than is normal. Similar adjectives are *super-active, super-clever, super-friendly, super-intelligent, super-rich*, etc. **(b)** 'exceeding the norms of the feature mentioned in the root'. This sense occurs when the adjectival roots are gradable, applying to non-humans. For example, *a super-cheap article* is an article that is extremely cheap. Similar adjectives are *super-efficient, super-modern, super-precious, super-quick, super-secure,* etc. **(c)** 'being greater in power than the thing mentioned in the root'. This sense occurs when the nominal bases are common personal nouns. For example, *a super-model* is a model who is very successful or famous. Similar nouns are *super-athlete, super-genius, super-hero, super-leader, super-man*, etc.

In the periphery, the prefix *super-* subsumes three particularities. **(a)** 'hugely bigger in size than the thing signalled by the root'. This sense occurs when the nominal bases are concrete, denoting inanimate entities. For example, a *supertanker* is a very large cargo ship able to carry a large amount of oil. Similar nouns are *super-ferry, super-jumbo, supermarket, super-computer, superpower*, etc. **(b)** 'built on the thing mentioned in the root'. This sense occurs when the nominal roots are concrete, denoting inanimate entities. For example, *a superscript* is a script that is written or printed above the normal line of writing or printing. Similar nouns are *superaltar, supermarine, superstructure, superstratum, supertax*, etc. **(c)** 'ranked higher than the category mentioned in the root'. This sense occurs when the nominal roots are abstract, denoting animate entities. For example, *a superorder* is a category of biological classification ranking above an order. Similar nouns are *superclass, superfamily, superspecies,* etc.

A graphical representation of the multiple senses of the prefix *super-* is offered in Figure 8:

Figure 8: The semantic network of the prefix *super-*

The solid arrow represents the prototypical sense, whereas the dashed arrows represent the semantic extensions.

9. under-

Predominant in the network of the prefix *under-* is the sense of location. It has the meaning 'below or underneath the thing expressed by the root'. This sense occurs when the nominal roots are concrete. For example, *underwear* is clothing worn under other clothes next to the skin. Examples of other nouns include *underclothes, undercurrent, underground, underpass, undertow*, etc.

Subordinate in the network of the prefix *under-* is the sense of degradation. It has two semantic niceties. **(a)** 'less in degree or quantity than the thing expressed by the root'. This sense occurs when the verbal roots are (in) transitive. For example, *to undervalue* is to consider something as less valuable or important than it really is. Examples of other verbs, and the adjectives derived from them, include *under-estimate, under-grow, under-pay, under-state, under-use*, etc. **(b)** 'lower in rank than the person expressed by the root'. This sense occurs when the nominal bases are common personal nouns. For example, *an underachiever* is a person who performs less well or achieves less success than expected. Examples of other nouns include *undergraduate, undersecretary*, etc. The same sense is true when the prefix is annexed to numbers. For example *under-fives* are children who are younger than five years old.

A graphical representation of the multiple senses of the prefix *under-* is offered in Figure 9:
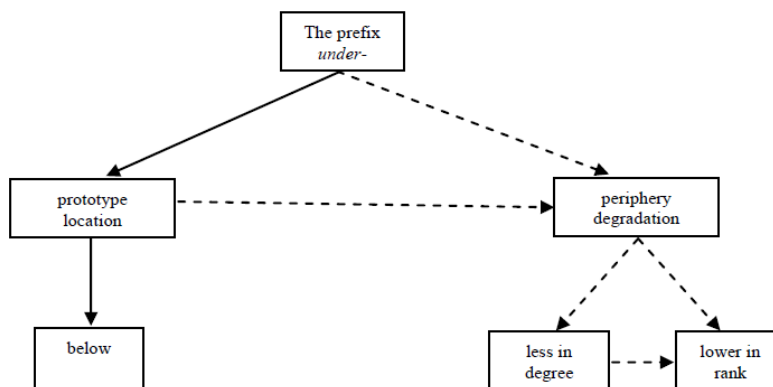

Figure 9: The semantic network of the prefix *under-*

The solid arrow represents the prototypical sense, whereas the dashed arrows represent the semantic extensions.

Before going any further, let us draw some conclusions from the preceding discussion about the prefixes of spatiality. One conclusion is that each prefix forms a category of its own, which includes its multiple senses. Another conclusion is that the senses of a prefix gather around one representative sense, referred to as the *prototype*. A further conclusion is that the category of a prefix is a powerful conceptual framework which allows us to see how the different senses are related to one another. A look at the categorial descriptions of the prefixes shows where the senses converge and where they diverge. On the basis of the converging senses, the prefixes can be grouped into sets, referred to as a *domain*. It is within this domain that the prefixes can stand against each other as rivals. So, a domain is concerned with a knowledge configuration in which prefixes gather showing similarity on the surface but dissimilarity below the surface. Two prefixes may stand for one concept but differ in the specifics. The elaboration of this cognitive tenet will be the task of the next section.

B. Domain

Traditional dictionaries describe the lexicon by allotting the lexical items of any language separate entries, with information about meaning, usage or register. In this way, dictionaries fail to show that many of these items have something in common as well as something in difference. As a result, dictionaries stop short of showing how they are related to one another. To solve this problem, Cognitive Semantics suggests, as Langacker (1987, 1991) advocates, building linguistic descriptions on the *domain* theory. A domain is any background knowledge, including such notions as space, time, degree and the like, with reference to which a conceptualisation can be made. In language, a domain is a knowledge configuration which provides the context for the characterisation of linguistic expressions. Precisely, it is a knowledge structure with respect to which the meaning of a lexical item can be characterised. To understand the meaning of any lexical item, it is necessary to understand the conceptual knowledge that it evokes. The meaning of any lexical item can be defined in terms of the background knowledge that underlies its usage. For example, in describing the meaning of the word *father*, the speaker needs to activate the domain of *kinship* as the background knowledge for his description.

The domain theory is significant to all areas of language. In Hamawand (2003b), I applied it to the description of verbs taking *for-to* complement clauses in English. In Hamawand (2007, 2008), I applied it to the description of prefixes. In Hamawand (2009), I applied it to the description of negative prefixes. In the present analysis, I adopt it in the description of spatial prefixes. Spatial refers to space and the position, size, shape, etc. of things in it. The meaning of a prefix depends on the domain to which it belongs, knowledge of which is necessary for its appropriate use. A domain is used as a cognitive device which allows one to describe the distribution of different prefixes and provide the motivation for their use in discourse. In this regard, I argue that prefixes form sets so that to understand the semantic structure of any prefix it is necessary to understand the properties of the set in which it occurs as well as the properties of the other members of the set. The interpretation of a prefix can then be defined against the domain that it invokes. A domain captures semantic information about prefixes. It includes information about the specific meanings or the distinctive uses of the prefixes. A domain is then a powerful mechanism which reveals specification and guides usage.

The domain of spatiality is a sphere of knowledge pointing to the position of things on an axis. An axis can be either horizontal or vertical. A horizontal axis refers to the linear arrangement of things, i.e. their positions on a baseline or in comparison to one another. A vertical axis refers to the plumb arrangement of things, i.e. their positions on an upright line. In terms of horizontal axis, spatiality includes three facets: front, middle and rear. Front is the position of something at the beginning. It refers to the part of something located opposite its rear. Middle is the position of something at the centre. It refers to the part of something located between front and rear. The position serves to encompass interaction or involvement between two or more entities, no matter if they are animate or inanimate. Rear is the position of something at the back. It refers to the part of something located opposite its front.

Morphologically, the subdomain of horizontal spatiality is realised by the prefixes *ante-, fore-, mid-, inter-, intra-* and *post-*. Each prefix occupies a particular place in a linear order. *Ante-* means 'in front of the place referred to by the root'. It depicts an entity as being situated before another. *Fore-* means 'situated in front of the place mentioned in the root'. It sketches an entity, or its first part, as being situated in front of another. *Mid-* means 'the central part of the place denoted by the root'. It portrays an entity as being in the middle of something. *Inter-* means 'between the entities stated in the root'. It refers to interaction between entities in different places. *Intra-* means 'within the entity stated in the root'. It refers to interaction between entities within the same place or group. *Post-* means 'behind the place named in the root'. It describes an entity as being behind something else.

Let us now examine some examples to see if the prefixes fit different facets within the subdomain.

(1) a. antechamber, ante-room
b. forecourt, forecastle, foredeck
c. midfield, midsection, midway
d. inter-city, inter-office, inter-school
e. intra-family, intra-party, intra-class
f. postorbital, postaxial, postcentral

The examples under (1) contain words formed by adding prefixes to nominal (a-e) and adjectival (f) free morphemes, forming nouns in (a-c) and adjectives in (d-f). They reveal two facts about the prefixes. First, the prefixes indicate horizontal spatiality. Second, the prefixes symbolise different facets. In (1a) the prefix *ante-* describes the front part of a place. For example, *antechamber* means 'a small room situated in front of a larger room'. In (1b), the prefix *fore-* describes the front part of a place. For example, *forecourt* means 'a flat area in front of a large building'. In (1c), the prefix *mid-* describes the middle part of a place. For example, *midfield* means 'the middle portion of a sports field'. In (1d), the prefix *inter-* describes interaction between places or people. For example, *inter-city* means 'between two or more cities'. In (1e), the prefix *intra-* describes interaction within the same place or people. For example, *intra-family* means 'within a single family'. In (1f), the prefix *post-* describes the rear part of a place. For example, *postorbital* means 'situated behind the eye'.

Morphologically, the subdomain of vertical spatiality is realised by the prefixes *sub-, super-* and *under-*. Each prefix occupies a particular place in a vertical order. *Sub-* means 'below or beneath the thing named by the root'. It depicts an entity as being placed under another. *Super-* means 'built on the thing mentioned in the root'. It describes an entity as being placed on another. *Under-* means 'below or underneath the thing expressed by the root'. It pictures an entity as being placed under another.

Let us now examine some examples to see if the prefixes fit different facets within the subdomain.

(2) a. subway, sub-railway, subsoil
b. superstructure, superscript, superstratum
c. underground, underpass, undertow

The examples under (2) contain nouns formed by adding prefixes to nominal free morphemes. They reveal two facts about the prefixes. First, the prefixes indicate vertical spatiality. Second, the prefixes symbolise different facets. In (2a), the prefix *sub-* describes one entity as being under another. For example, *subway* means 'a path that goes under a road, etc. which people can use to cross to the other side'. In (2b) the prefix *super-* describes one entity as being above or over anther. For example, *superstructure* means 'a structure that is built on top of something, for example the upper parts of a ship or the part of a building above the ground'. In (2c), the prefix *under-* describes one entity as being under another. For example, *underground* means 'a cable, passage or stream that is under the surface of the ground'.

For easy reference, I summarise in the table below the (sub)domains evoked by spatial prefixes in English.

TABLE 1:
THE FACETS EVOKED BY SPATIAL PREFIXES IN ENGLISH

domain	subdomains	exponents	meaning differences
spatiality	horizontality	*ante-*	depicts an entity as being situated before another
		fore-	sketches an entity, or its first part, as being situated in front of another
			portrays an entity as being in the middle of something
		mid-	refers to interaction between entities in different places
		inter-	refers to interaction between entities within the same place or group
		intra-	describes an entity as being behind something else
		post-	
	verticality	*sub-*	describes one entity as being below another
		super-	describes one entity as being above anther
		under	describes one entity as being beneath another

In the table drawn above, I show how the domain theory applies to the description of prefixes in English. The description comprises four steps. In the first step, I place the prefixes under one domain, which I name *spatiality*. In the second step, I group the prefixes into two sundomains, which I name *horizontality* and *verticality*. This is done relative to the definitions provided in the previous section. In the third step, I identify the prefixes that represent each subdomain. In the fourth step, I explain the rivalry between the prefixes by pinpointing the peculiarity of each prefix which makes it

different from its counterpart. When and how to use a prefix is a matter decided by the speaker. The choice of the speaker comes under the rubric of *construal*. Construal is concerned with the ways the speaker conceives a situation and the right expressions s/he chooses to realise them. Two prefixes that stand as rivals construe a situation in different ways. The elaboration of this cognitive tenet will be the task of the following section.

C. Construal

Traditional dictionaries describe lexical pairs that look alike as synonymous. Formalist paradigms regard them as an idiosyncrasy of the lexicon and often present them as semantic alternatives. In this way, formalist paradigms disregard the fact that every lexical item has a certain mission to achieve in discourse. According to the present analysis, it is an axiomatic fact that lexical items are in no way interchangeable even if they look similar or share the same source. To prove this, I build the analysis on Langacker's (1987, 1991) theory of *construal*. Construal is a cognitive ability to portray the same scene in alternate ways. It is a language strategy which allows the speaker to conceptualise a situation and choose the linguistic structure to represent it in discourse. In Cognitive Semantics, the meaning of a linguistic expression, as Langacker (1997) states, does not reside in its conceptual content alone, but includes the particular way of construing that content. The constructions *He sent a letter to Susan*, and *He sent Susan a letter* share similar wording, but they involve different ways of construing the same content. In the prepositional construction, it is the issue of movement that is foregrounded, whereas in the ditransitive construction it is the result of the action that is foregrounded. Therefore, only the second construction implies that *Susan* has received the letter.

The construal theory is present in almost every area of a language. In Hamawand (2002), I applied it to the description of complement clauses in English. In Hamawand (2007, 2008), I applied it to the description of prefixes. In Hamawand (2009), I applied it to the description of negative prefixes. In the present analysis, I extend its impact to the description of spatial prefixes. In this connection, I argue that the choice of a derived word correlates with the particular construal imposed on its root. At first sight, pairs may appear to be synonymous. A closer look, however, reveals that they are neither identical in meaning nor interchangeable in use. There is a clear-cut distinction in their definitions. There are two keys to using these words correctly. One key is to know that the two words constitute different conceptualisations of the same situation. The different conceptualisations reflect different mental experiences of the speaker. The other key is to know that, as a result, the two words are realised morphologically differently. In each derivational case, it is the spatiality-denoting prefix that encodes the intended conceptualisation. The different prefixes, therefore, single out different aspects of the meaning of the root.

Such pairs, if ever mentioned in dictionaries, are listed without clear distinction. Dictionaries confirm that they are interchangeable. Usage books often present such pairs as reciprocal words. However, database evidence shows that they are different in use. It is true they share a common root, but they are far from being equal. The derived words relate to the slightly different aspects of the root. The difference is a matter of the alternate ways the root is construed, which is morphologically mirrored by different prefixes. The construal that is at work here is called *perspective*. According to Langacker (1988a), it refers to the particular viewpoint taken on something. Two expressions differ in meaning depending on which aspects within the situation they designate. In addition, speakers have the ability to construe the same situation in many ways and choose the appropriate structures to represent them. Consequently, the perspective embodied by a linguistic expression constitutes a crucial facet of its meaning.

For the pair list, I retrieve the data provided by the BNC. To create the list, I compare the occurrences of two prefixes with a view to finding the words that share the same root. The lists of pairs are not exhaustive but copious enough to reflect the meaning differences between the derived words. For the definitions of the common roots of the pairs, I rely on such major online English dictionaries as *Oxford English Dictionary*, *Cambridge English Dictionary* and *Merriam-Webster Dictionary*, among others. For the exemplification of the meanings diagnosed, I provide sentences based on the corpus. In most cases, I tend to shorten the sentences by deleting all the non-essential elements. For the sake of reinforcement, I check the characterisation of some nominal pairs, if ever mentioned, against major manuals on English usage like Fowler (1996), Patridge (1961) and Greenbaum & Whitcut (1988), Peters (2004) and native-speaker intuitions.

Below are the different perspectives taken on the roots, which are responsible for the semantic distinctions.

1. Within vs. between

The prefixes *intra-* and *inter-* attach to same nominal roots to form adjectival pairs. They evoke the domain of horizontal spatiality, but they emphasise different angles of it. The prefix *intra-* characterises an entity as being within or inside the same group of people, places or objects. It means 'within the entity stated in the root'. The prefix *inter-* characterises an entity as being between separates groups of people, places or objects. It means 'between the entities stated in the root'. A look at the data validates the differences in their signification. *Intra-* signifies interaction taking place inside the same group of people or location. *Inter-* signifies interaction taking place between different groups of people or different locations. A perfect reflection of this distinction is provided by the adjectival pair below:

(3) intra-state vs. interstate
    a. The chaos represents the outcome of *intra-state* conflicts.
    b. They emphasised the need to improve *interstate* exports.

The two adjectives in (3) are derived from the nominal root *state*, meaning 'a country or nation with its own government'. Yet, construal marks a difference between them in usage. In (3a), the noun *intrastate* means 'occurring

within a single state'. *Intra-state conflicts* are conflicts that emerge within the boundaries of a single state. *Intra-state* is preferable in the context of politics such as *clashes, conflicts, disputes, relationships*, *services*, etc. In (3b), the noun *interstate* means 'occurring between two or more states'. *Interstate exports* are exports that take place between many states. *Interstate* is preferable in the context of commerce such as *export, highways, trade, transfer, transport*; politics such as *conferences*, *negotiations, relations, rivalries, wars*, etc.

2. below vs. above

The prefixes *sub-* and *super-* attach to same nominal roots to form nominal pairs. They evoke the domain of vertical spatiality, but they highlight different aspects of it. The prefix *sub-* describes an entity as being below another. It means means 'below or beneath the thing named by the root'. The prefix *super-* describes an entity as being above another. It means 'built on the thing mentioned in the root'. A scan of the data verifies the differences in their denotation. *Sub-* denotes an element that is lower than another on a vertical axis. *Super-* denotes an element that is higher than another on a vertical axis. A clear exemplification of this distinction is provided by the nominal pair below:

(4) substructure vs. superstructure

a. The explosion damaged the house, but the substructure remained intact.

b. The house foundations are finished; we are building the superstructure.

The two nouns in (4) are derived from the nominal root *structure*, meaning 'the way in which the parts of something are connected together, arranged or organised'. However, construal separates them in usage. In (4a), the noun *substructure* means 'a structure that is below another and that supports'. A substructue is any structural element that is constructed below the ground floor, used to support the structure above. *Substructure* is preferable in the context of building, which could range from a simple foundation to a basement floor, or more complex structures such as subways or underground tunnels. In a house, the components of a substructure include foundation, basement, subfloor, etc. In (4b), the noun *superstructure* means 'a structure that is built on top of another'. A superstructure is any structural element that is constructed above the ground floor. *Superstructure* is preferable in the context of building, which could be a simple residential house to a multi-story building or a complex structure. In a house, the components of a superstructure include beams, columns, doors, slabs, walls, etc.

V. Conclusion

This paper has dealt with prefixes of spatiality in English. The aim of the paper was to show that morphology is semantically motivated, and that differences in morphological structures reflect differences in meaning. To shed light on the the problem, the study has evaluated some cognitive tenets against morphological data offered in the BNC, and so made three significant contributions.

The first contribution lies in identifying the different senses of a prefix. Spatial prefixes form categories; a category is a network made up of a range of senses exhibiting minimal differences. As bound morphemes, spatial prefixes are meaningful. They play important roles in determining the meanings of the words of which they are part. They are polysemous in the sense that they are associated with a number of related but distinct senses. These senses are organised around a primary sense component called a *prototype*, from which the set of additional senses are derived. That is, the idea is to identify the prototypical sense for each prefix and to work out from there to get to the marginal senses. The aim has been to prove that there is a strong correspondence between the content of a morphological unit and the mode of expression it takes.

The second contribution lies in grouping the prefixes in a domain, whereby the minute differences in their meaning come out. Spatial prefixes gather in *domains*; a domain is a concept in which several members interact, and with respect to which they are defined. Two or more prefixes may belong to the same subdomain, but they differ in that they project different facets of it. The aim has been to prove that there is a strong correspondence between semantic properties and their morphological exponents. Two subdomains have emerged from my investigations of the spatial prefixes. One subdomain pertains to *horizontality*. Its exponents are *ante-, fore-, mid-, inter-, intra-* and *post-*. The other subdomain pertains to *verticality*. Its exponents are *sub-, super-* and *under-*.

The third contribution lies in accounting for the differences in meaning between rival prefixes. When prefixes attach to the same root, the derived forms are not synonymous. A prefix pair standing as rivals is by no means in complementary distribution, and the words they form are not in free variation. The distinction between the pair is not governed by phonological and/or syntactic constraints, as non-cognitive paradigms claim. Rather, the distinction is ascribed to meaning. Following the cognitive paradigm, a morphological structure is to a significant degree a response to a conceptual structure. Semantic considerations control the preference of one lexical item over another. Precisely, the distinction resides in the alternate ways the word pair is construed, which is realised by different prefixes. In each derivation, the prefix shifts the meaning of the root to a certain direction, and so encodes the intended construal. This is evidenced by the distinguishing collocates of each pair member, which the corpus data have shown.

References

[1]   BNC. British National Corpus. Available at: http://sara.natcorp.ox.ac.uk.

[2]   Bybee, Joan and Paul Hopper. (2001). "Introduction". In Joan Bybee and Paul Hopper (eds.). *Frequency and the Emergence of Linguistic Structure*: 1-24. Amsterdam: Benjamins.

[3]   Cambridge Dictionaries Online. Available at: http://dictionary.cambridge.org.
[4]   Collins Cobuild. (1993). Word Formation. London: HarperCollins Publishers.
[5]   Croft, William & D. Allen Cruse. (2004). Cognitive Linguistics. Cambridge: Cambridge University Press.
[6]   Fauconnier, Gilles. (1985). Mental Spaces: Aspects of Meaning Construction in Natural Language. Cambridge: Cambridge University Press.
[7]   Fauconnier, Gilles. (1997). Mappings in Thought and Language. New York: Cambridge University Press.
[8]   Fillmore, Charles. (1977). "Scenes-and-frames". In Antonio Zampolli. (ed.) *Linguistic Structures Processing*: 55-81.
[9]   Fillmore, Charles. (1982). "Frame Semantics". In Linguistic Society of Korea (ed.) *Linguistics in the Morning Calm*: 111-138.
[10]   Fowler, Henry. (1996). Modern English Usage. Oxford: Oxford University Press.
[11]   Greenbaum, Sidney & Janet Whitcut. (1988). *Longman Guide to English Usage.* Essex: Longman.
[12]   Hamawand, Zeki. (2002). Atemporal Complement Clauses in English. A Cognitive Grammar Analysis. München: Lincom.
[13]   Hamawand, Zeki. (2003a). "The construal of atemporalisation in complement clauses in English". *Annual Review of Cognitive Linguistics* 1: 61-87. Benjamins.
[14]   Hamawand, Zeki. (2003b). "For-to complement clauses in English: A Cognitive Grammar analysis". *Studia Linguistica* 57: 171-192. Blackwell Publishing.
[15]   Hamawand, Zeki. (2007). Prefixal Rivalry in Adjective Formation. A Cognitive-Corpus Analysis. London: Equinox.
[16]   Hamawand, Zeki. (2008). Morpho-Lexical Alternation in Noun Formation. London: Palgrave Macmillan.
[17]   Hamawand, Zeki. (2009). The Semantics of English Negative Prefixes. London: Equinox.
[18]   Hamawand, Zeki. (2011). Morphology in English. Word Formation in Cognitive Grammar. London: Continuum.
[19]   Kemmer, Suzanne and Michael Barlow. (2000). "Introduction". In Barlow, Michael and Suzanne Kemmer (eds.). *Usage-Based Models of Language*: vii-xxviii. Stanford, California: CSLI Publications.
[20]   Lakoff, George. (1987). Women, fire and dangerous things: What categories reveal about the mind. Chicago: University of Chicago Press.
[21]   Lakoff, George. (1990). "The invariance hypothesis: is abstract reason based on image schemas?" *Cognitive Linguistics* 1: 39-74.
[22]   Langacker, Ronald. (1987). Foundations of Cognitive Grammar. Vol.1: Theoretical Prerequisites. Stanford: Stanford University Press.
[23]   Langacker, Ronald. (1988a). "A view of linguistic semantics". In Brygida Rudzka-Ostyn (ed.) *Topics in Cognitive Linguistics*: 49-90.
[24]   Langacker, Ronald. (1988b). "A usage-based model". In Brygida Rudzka-Ostyn (ed.) *Topics in Cognitive Linguistics: Current Issues in Linguistic Theory*: 127-161.
[25]   Langacker, Ronald. (1991). Foundations of Cognitive Grammar. Vol. 2: Descriptive Application. Stanford: Stanford University Press.
[26]   Langacker, Ronald. (1997). "Consistency, dependency and conceptual grouping". *Cognitive Linguistics* 8: 1-32.
[27]   Langacker, Ronald. (2000). "A Dynamic Usage-Based Model". In Suzanne Kemmer and Michael Barlow (eds.) *Usage Based Models of Language*: 1-63.
[28]   Marchand, Hans. (1969). The categories and types of present-day English word formation. A Synchronic-diachronic approach. Munich: Beck.
[29]   Merriam-Webster Dictionary Online. Available at: http://www.m-w.com.
[30]   Oxford English Dictionary Online. Available at: http://www.oed.com.
[31]   Patridge, Eric. (1961). Usage and Abusge. A guide in Good English. London: Hamish Hamilton.
[32]   Peters, Pam. (2004). The Cambridge Guide to English Usage. Cambridge: Cambridge University Press.
[33]   Talmy, Leonard. (1983). "How language structures space". In Herbert Pick, and Linda Arcedolo. (eds.) *Spatial Orientation: Theory, Research, and Application*: 225-282.
[34]   Talmy, Leonard. (1985). "Force dynamics in language and thought". *Chicago Linguistic Society* 21:293-337.
[35]   Taylor, John. (1989). Linguistic Categorisation. Prototypes in Linguistic Theory. Oxford: Clarendon Press.
[36]   Taylor, John. (2002). Cognitive Grammar. Oxfor: Oxford University Press.
[37]   Tomasello, Michael. (2000). "First Steps toward a Usage-based Theory of Language Acquisition". *Cognitive Linguistics* 11: 61-82.
[38]   Urdang, Laurence. (1982). Prefixes and other word-final elements of English. Detroit: Gale Research Company.

Zeki Hamawand is Professor of English Linguistics at the University of Kirkuk, Iraq. He is the author of several papers and books like *Atemporal Complement Causes in English: A Cognitive Grammar Analysis* (Lincom 2002), *Suffixal Rivalry in Adjective Formation: A Cognitive-Corpus Analysis* (Equinox 2007), *Morpho-Lexical Alternation in Noun Formation* (Palgrave 2008), *The Semantics of English Negative Prefixes* (Equinox 2009), and *Morphology in English: Word Formation in Cognitive Grammar* (Continuum 2011).