

**The Semantic Poles of Old English.**  
**Towards the 3D Representation of Complex Polysemy**

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Abstract: This article explains some aspects of the verbal polysemy of Old English by means of the concept of semantic pole, an area of semantic space that represents a core meaning. It draws on the semantic primes of the Natural Semantic Metalanguage, the theoretical constructs of semantic space and force dynamics as well as semantic maps based on graph theory. In the semantic map, graphs link poles to definiens and lexical nodes, in such a way that the centrality of the poles is indicated, quantitatively, by the number of edges and, qualitatively, by the distance between the pole that exerts the centrifugal force and the pole to which such a force is directed. The conclusion is reached that the semantic poles MOVE, BE and SAY constitute the core of the verbal lexicon of Old English, considering the semantic space that they occupy and the centrifugal and centripetal forces that produce polysemy originating in these semantic poles.

### **1. Introduction**

This article deals with the verbal semantics of Old English within the realm of Digital Humanities. Its aim is twofold. Firstly, it describes some aspects of the verbal polysemy of this historical stage of English and explains this phenomenon by means of the concept of semantic pole. Secondly, **it takes a further step towards the three-dimension representation of the lexicon with respect to previous work on 3D linguistic representation, such as the derivational map of Old English (Martín Arista 2012, 2013), because it incorporates the concept of the semantic map consisting of semantic dimensions and poles.** The descriptive apparatus is provided by the semantic primes of the *Natural Semantic Metalanguage* (Goddard and Wierwizcka eds. 1994, 2002; Goddard 2008; Goddard 2012; Goddard and Wierzbicka 2014), while the theoretical inspiration derives from force dynamics (Talmy 2000), semantic space (Lowe 2001; Gärdenfors 2004) and semantic maps (Croft 2003; Haspelmath 2003; François 2008; Gaume et al. 2008).

Given these aims, the article is organised as follows. Section 2 advances the concept of semantic poles, defined as areas of semantic space that represent a core

meaning. Section 3 focuses on the configuration of semantic poles and puts forward a semantic pole of Old English. Section 4 unfolds the methodology of analysis, which comprises semantic dimensions, semantic poles, *definiens* (meaning definitions) and *definienda* (lexical nodes). Section 5 examines the patterns of polysemy that emerge in the semantic poles and across them and classifies such patterns into those that involve two semantic poles (simplex polysemy) and those affecting three semantic poles (complex polysemy). Section 6 discusses the findings of section 5 and approaches the polysemy patterns that have not been dealt with in previous work from the perspective of the adequacy of the categories of the Natural Semantic Metalanguage for Old English. To close this work, section 7 summarises the main conclusions.

## **2. The poles of semantic space**

This article proposes the concept of semantic pole, an area of semantic space that represents a core meaning. This proposal draws its inspiration, on the descriptive side, from the semantic primes of the Natural Semantic Metalanguage (hereafter NSM), and, on the theoretical side, from semantic space, force dynamics and semantic maps based on graph theory.

The descriptive basis of this proposal for semantic poles is the NSM (Goddard and Wierwizcka eds. 1994, 2002; Goddard 2008; Goddard 2012; Goddard and Wierzbicka 2014). The NSM aims at finding the universal indefinable meanings by means of which any lexical item of the natural languages can be decomposed and explained. Such decomposition and explanation are based on the principle of reductive paraphrase whereby semantically complex concepts are defined in simple and translatable terms compatible with rigorous semantic analysis. **Thus, semantic primes combine with each other to create a metalanguage that consists of the following semantic primes by category:** Substantives (I, YOU, SOMEONE, PEOPLE, SOMETHING/THING, BODY), Determiners (THIS, THE SAME, OTHER), Quantifiers (ONE, TWO, SOME, ALL, MUCH/MANY), Evaluators (GOOD, BAD), Descriptors (BIG, SMALL), Mental predicates (THINK, KNOW, WANT, FEEL, SEE, HEAR), Speech (SAY, WORDS, TRUE), Actions, events, movement, contact (DO, HAPPEN, MOVE, TOUCH), Location, existence, possession, specification (THERE IS, HAVE, BE), Life and death (LIVE, DIE), Time (WHEN/TIME, NOW, BEFORE, AFTER, A LONG TIME, A SHORT TIME, FOR SOME TIME), Space (WHERE/PLACE, HERE, ABOVE, BELOW, FAR, NEAR, SIDE, INSIDE), Logical

concepts (NOT, MAY BE, CAN, BECAUSE, IF), Intensifier, augmentor (VERY, MORE), Taxonomy, paronymy (KIND OF, PART OF) and Similarity (LIKE). Of the various research venues of the NSM Research Programme, this article pays heed to polysemy. NSM researchers point out that universal meanings overlap with other meanings in the exponents for semantic primes in the natural languages. Thus, polysemy has been identified between **the universal** DO and **the exponent** ‘to make’; FEEL and ‘to taste’, ‘to smell’, ‘to hear’ and ‘to feel by touch’; BEFORE and ‘first’, ‘ahead’ as well as ‘in front of’; WORDS and ‘what is said’, ‘message’, ‘to talk’ and ‘language’ (Goddard and Wierwizcka eds. 1994, 2002; Peeters ed. 2006; Goddard ed. 2008; Gladkova 2010). Furthermore, Wierzbicka’s (1996) remarks that polysemy holds not only within individual semantic primes but also between them. Thus, the polysemy of SEE and HEAR with respect to KNOW and THINK, on the grounds of which Wierzbicka (1996) includes the four of them into the category of Mental predicates. In the field of Old English studies, the analysis that has been done so far on the basis of the NSM is restricted to the search for semantic prime exponents **and their combinability**: Martín Arista and Martín de la Rosa (2006), de la Cruz Cabanillas (2007) and Mateo Mendaza (2013, 2016a, 2016b) have found, respectively, the Old English exponents of Substantives, determiners and quantifiers, Descriptors, TOUCH, HAPPEN and MOVE, **while Guarddon Anelo (2009) has studied the combinatorial properties of semantic primes as reflected in some Old English complex adpositions**. So as to pursue innovative research lines, this article deals with relations between universal meanings as realised in Old English **instead of** focusing on the exponence of an isolated prime or a category of primes. Moreover, the semantic study is aimed to polysemy, which is addressed from the perspective of the relation between core meanings **rather than only in terms of the various senses of a given lexical item**.

Turning to the theoretical background of semantic poles, in semantic space, concepts are areas which consist of features and dimensions (Gärdenfors 2004) or points designating entities, qualities or events (Erk 2009). The neurological basis of semantic space has been underlined by authors like Huth et al. (2012: 1210), who remark:

Humans can recognize thousands of different categories of objects and actions. Given the limited size of the human brain, it is unreasonable to expect that every one of these categories is represented in a distinct brain area (...) An efficient way

for the brain to represent object and action categories would be to organize them into a continuous space that reflects the semantic similarity between categories. A continuous semantic space could be mapped smoothly onto the cortical sheet so that nearby points in cortex would represent semantically similar categories.

From the strictly linguistic point of view, the motivation for semantic space is provided by distributional properties (Lowe 2001), so that the co-occurrence of two words in a corpus indicates their semantic relationship. Co-occurrence in semantic space is a criterion for defining the semantics of single words or exploring their combinability to make phrases (Fyshe et al. 2015) and, above all, the closeness of the relationship can be gauged by calculating the semantic space between the words in question (Padó and Lapata 2007). As in the works just reviewed, in this article semantic space is based on linguistic distribution. Unlike the cited authors, who take issue with natural languages, the target of this research is Old English, which raises the same concerns over corpus compilation and representativeness as other historical languages. For this reason, the concept of distribution applied in the remainder of this article is restricted to lexical derivation, in such a way that closeness is understood as proximity in a derivational paradigm. For Pounder (2000:82), a derivational paradigm is *a set of paradigmatic relations between word-formations sharing a lexemic root*. For instance, the derivational paradigm of the Old English adjective *dim* ‘dim, dark’ comprises *ādimmian* ‘to become dim’, *dimlic* ‘dim’, *dimmian* ‘to be or become dim’, *dimmnes* ‘darkness; a dark place’ and *fordimmian* ‘to darken’. Thus defined, the derivational paradigm includes transparent formations such as *dimlic* as well as opaque formations (recoverable on the diachronic axis only) like *dimmian*, whereas it excludes the compounds *dimhīw* ‘of dark colour’, *dimhof* ‘place of concealment’, *dimhūs* ‘prison’ and *dimscūa* ‘darkness, sin’. This conflation of the synchronic and the diachronic axes of analysis characterises a panchronic approach. Given the derivational paradigms of the language of analysis, it is possible to assess the distribution of lexical items on the basis of word-formation and to gauge it in terms of type (as opposed to token) frequency. From the semantic point of view, different degrees of exponence of the semantic primes of the NSM can be distinguished in the derivational paradigm.

Regarding force dynamics, Talmy (2000: 467) has proposed four schematic systems that organise the speech-event scene: configurational structure (temporal and spatial location of a scene by means of certain sentence elements), location of

perspective time (location or direction of the vantage point), distribution of attention (foregrounded vs. backgrounded elements) and force dynamics (the forces exerted on each other by the elements of the structural framework). Thus, force dynamics explains the semantic relations between both the different participants of a certain event and a given event and its sub-events. At these two levels, force dynamics accounts for the outcome of the interaction of forces in terms of the balance between the force exerted by an agonist and the opposite force applied by an antagonist, in such a way that the final result of the conflict between two forces, which reflect Newtonian action and reaction, is solved in favour of the stronger. In other words, the schematic system of force dynamics allows for an interpretation of grammatical categories in terms of the exertion of force, resistance to such a force, overcoming of resistance, blockage of force, removal of blockage, etc. The relevance of this theoretical construct lies in its physical character and its applicability to a dynamic three-dimensional framework. In this work, force dynamics is applied to lexical rather than to syntactic analysis but, as in syntax, the emphasis is put on relations rather than units. The thrust of the argument unfolded here is that the lexicon changes on the panchronic axis: changes that can only be recovered on the diachronic axis take place, at least locally (that is, within the derivational paradigm), on the synchronic axis. Among such changes, the appearance of new semantic relations of polysemy clearly sticks out. In the framework of semantic poles proposed in this article, the balance between two types of forces explains the relationship between semantic poles and, ultimately, the preference for certain polysemy patterns over others.

Semantic maps are graphical representations of linguistic units and relations based on the principle of spatial proximity, which stipulates that proximity in representational space indicates semantic similarity (Croft 2002; Haspelmath 2003). For Haspelmath (2003: 20), semantic maps *not only provide an easy way to formulating and visualizing differences and similarities between individual languages, but they can also be seen as a powerful tool of discovering universal semantic structures*. On the implications of semantic maps, Croft (2001: 287) holds that semantic maps describe the universal conceptual space that belongs to the speakers' mental representation and, furthermore, remarks that *semantic maps depict the geography of the human mind, which can be read in the facts of the world's languages in a way that the most advanced brain scanning techniques cannot ever offer us*. In the same line, Haspelmath (2003) considers semantic maps a direct representation of the meanings relations established in

the speakers' mind. This stand comes in the wake of the neurological basis of semantic maps summarised above.

Against this background, François (2008) represents polysemy by means of a semantic map in which the attested meanings of certain lexical items as well as their predictable connections constitute the core of the diagram. **In the framework of semantic poles, graph theory is incorporated in order to display relations between units in a more principled way than François (2008) and, moreover, so as to make semantic descriptions compatible with three-dimension representation. Graphs are mathematical structures consisting of a pair of elements, the relationship that links them and the direction of such relationship, as in {y, z}, which describes the arch or edge (relationship) holding between the vertices or points (units) y and z.** Gaume et al. (2008) incorporate graph theory to a semantic map in which vertices represent lexical units and edges express syntagmatic relations of cooccurrence **of words** in a large corpus, the paradigmatic relation of synonymy as well as the semantic proximity relations that arise when a word is found in the definition of the other in a dictionary. As in Gaume et al. (2008), in this work an edge is created between two lexical nodes when there are semantic proximity relations of the paradigmatic or the syntagmatic type. For example, the set of Old English 'foul' verbs hold semantic relations that can be represented with graph theory as is shown in Fig. 1.

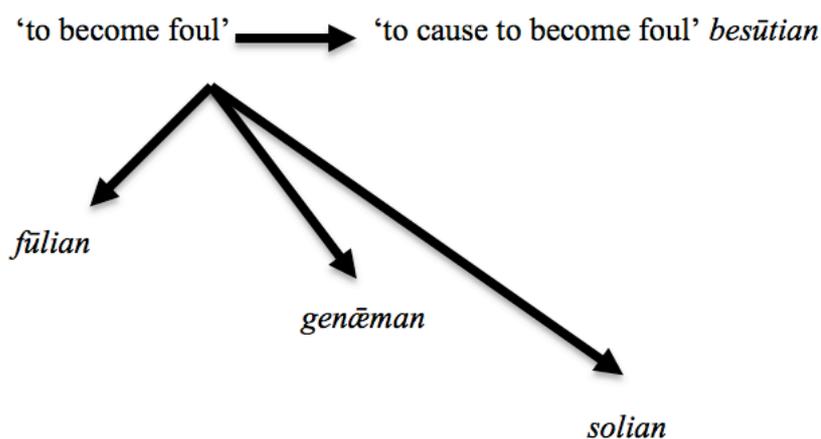


Fig. 1. 'Foul' verbs in graph theory.

The adoption of the model of semantic maps for this study is justified on the grounds of their applicability to language-specific and language-universal units and functions, the importance that they attribute to connectivity between convergent areas and, moreover,

their compatibility with graph theory, by means of which the lexicon can be represented as a network of relations between lexical nodes. Unlike previous proposals, which involve two-dimensional semantic maps, this paper puts forward a three-dimensional model of the lexicon on the grounds of dynamic semantic space comprised, among other things, of semantic poles. The dynamics is advanced in order to account for the convergence of formal and semantic continuity and inheritance as well as the rise of complex polysemy. Formal inheritance is paired by semantic inheritance if the scope of a semantic pole is restricted to a derivational paradigm. Far more frequently, the scope of the semantic pole is wider than a single derivational paradigm and, consequently, the degree of overlapping of lexical and semantic relations is much lower. Complex polysemy, for its part, is brought about by typological shifts (loss of historical homogeneity caused by massive borrowing; Kastovsky 1992) or semantic shift (usually widening of scope; Boyeldieu 2008; Zalizniak 2008). Dynamism, therefore, is introduced into the model in order to explain not only the instability of a linguistic area that is hard to reconcile with strict synchronic analysis but also the complexity of a semantic network that resists local treatment.

### 3. The configuration of semantic poles

Semantic poles are areas of the semantic space of a language that are defined by the representation of a core meaning and consist of lexical nodes among which there is meaning continuity, but no formal continuity is required.<sup>1</sup> Given that continuity is a defining property of semantic space (thus, for instance, Huth et al. 2012), this term calls for some clarification in the context of the undertaking. **In this line, an initial distinction needs to be drawn between formal aspects, which are more relevant for morphology, and semantic ones. With this difference in mind, two perspectives are compatible with the framework of semantic poles: core > periphery (which resembles top-down procedures in 2D models) and periphery > core (which is similar to the bottom-up direction in 2D models).**

Formal continuity (which is identifiable in the direction core > periphery) and formal inheritance (which, by contrast, can be identified in the direction periphery > core) are the result of lexical relations of derivation, which hold in derivational paradigms and involve a meaning constant and a formal variable. For example, in the derivational paradigm of Old English (*ge*)*berstan* ‘to break, burst, fail, fall; escape; break to pieces’, derivatives like the following are morphologically and semantically

related to the strong verb, which functions as base of derivation: *āberstan* ‘to burst out, break out; escape’, *forberstan* ‘to break, burst asunder, vanish, fail’, *fullberstan* ‘to burst completely’, *oðberstan* ‘to break away, escape’, *tōberstan* ‘to burst apart’, *ūtāberstan* ‘to burst out, burst forth’, *ūtberstan* ‘to burst out, burst forth’.<sup>2</sup> From the core of the paradigm to its periphery, formal continuity arises between more direct and less direct derivatives of the strong verb (*berstan* > *āberstan*), whereas, from the periphery to the core of the paradigm, more derived items inherit formal features from less derived items (*ūtāberstan* < *āberstan*). **Put in other words, non-recursive formations like *āberstan* cluster around the strong verb whereas recursive derivatives such as *ūtāberstan* are based on non-recursive formations and tend to occupy the periphery of the paradigm.**

Semantic continuity (core > periphery) and semantic inheritance (periphery > core) result from semantic relations, which apply in semantic dimensions defined by meaning constants and variables. For instance, the semantic dimension of change comprises, among others, the semantic constant ‘to become’, which combines with many adjectival variables in verbs like *dimman* ‘to become dim’, *fūlian* ‘to become foul’, *heardian* ‘to become hard’ and *hāsian* ‘to become hoarse’. At least two types of semantic relations can be described with respect to these verbs. For example, the verbs *genēman* and *solian* are synonymous with *fūlian* ‘to become foul’, while verbs such as *besūtian* ‘to cause to become foul’ are **causal** with respect to *fūlian* ‘to become foul’.

On the synchronic axis, form and meaning continuity motivate derivational paradigms, whereas semantic dimensions lack a formal basis, except those areas in which paradigmatic relations are matched by syntagmatic relations, **that is to say, when semantic relations of, for instance, opposition, motivate derivation, as in *unbrād* ‘narrow’ (< *brād* ‘broad’)**. On the diachronic axis, if there is formal continuity, the existence of a link **explains** the modification of meanings but, in the absence of formal continuity, the dynamic character of the lexicon, whereby more specialised or non-literal meanings arise, needs to be attributed to a less substantive element than a shared lexemic root. The position that this article adopts in this respect is that unless a spatial concept of the lexicon of the language is adopted, the representation of paradigmatic relations may be less rich and explicit than the one of syntagmatic relations, both on the synchronic and the diachronic axis. For this reason, in the remainder of this work, a spatial conception of the semantics of the language is adopted that is compatible with three-dimensional representation. This proposal comprises semantic dimensions, semantic poles, lexical nodes and semantic primes.

In semantic space, semantic dimensions comprise one or more semantic poles, so that meaning continuity is paired by spatial adjacency. Semantic poles, as has already been said, are areas of semantic space that represent a core meaning. Semantic poles consist of a number of lexical nodes related to one another by meaning relations. **The area of semantic space taken up by a semantic pole is directly proportional to the number of lexical nodes that it comprises. With these premises,** semantic poles exert two types of forces on the surrounding semantic space: centrifugal forces (outward forces) directed away from the pole and centripetal forces (inward forces) exerted towards the pole. In force dynamics, the final force results from the balance of two opposite forces. **In the framework of semantic poles, when centripetal forces prevail over centrifugal forces, the outcome is the modification of the meanings of the lexical nodes that belong to the area of influence of the semantic pole. If centrifugal forces overpower centripetal forces, the result is the modification of the lexical nodes that are under the scope of other semantic poles.**

In this work, core meanings are provided by the NSM. However, in order to configure the semantic poles of Old English in terms of the NSM primes, it is necessary to define the concept of degree of semantic exponence. Major exponents convey as their only or their main meaning the one coded by the semantic prime, whereas minor exponents convey the meaning of the prime only secondarily. Thus, the distinction between major and minor exponents of semantic primes contributes to the overall explanation for polysemy. For example, the major exponents of the semantic prime TRUE are the adjectives *trēowe* ‘true’ and *sōð* ‘true’, **whose lexical paradigms (including the derivatives that share the lexemic root in question only) can be seen in Fig. 2.**

*trēowe* ‘true, faithful, honest, trustworthy; genuine’

*fortrūwian* ‘to be presumptuous’, *fortrūwodnes* ‘presumption’, *fortrūwung* ‘presumption’, *fultrūwian* ‘to confide in’, *(ge)trēowð* ‘truth’, *(ge)trēowan* ‘to believe’, *(ge)trēowfæst* ‘true, faithful’, *(ge)trēowful* ‘faithful, trusty, true’, *(ge)trēowfullīce* ‘faithfully’, *(ge)trēowlēas* ‘faithless, treacherous, false; unbelieving’, *(ge)trēowsian* ‘to plight one’s faith; exculpate oneself’, *(ge)trūwa* ‘fidelity, faith, confidence, trust, belief; pledge, promise, agreement, covenant; protection’, *(ge)trūwian* ‘to trust’, *getrēowfæstnian* ‘to be trusty’, *getrēowlēasnes* ‘treachery, faithlessness; unbelief, heresy’, *getrēownes* ‘faithfulness’, *getrūwung* ‘confidence’, *ofertrūwa* ‘over-

confidence’, *ofertrūwian* ‘to trust too much’, *ontrēowan* ‘to entrust’, *ortrēownes* ‘mistrust’, *ortrūwian* ‘to doubt’, *ortrūwung* ‘doubt’, *trēow* ‘truth, fidelity, faith, trust, belief; pledge, promise, agreement, treaty; favour, grace, kindness’, *trēowlice* ‘confidently’, *trēowlic* ‘true, faithful, trusty; safe’, *ungetrēowð* ‘unfaithfulness, treachery’, *ungetrēowe* ‘untrue, faithless’, *ungetrēownes* ‘unbelief; faithlessness’, *untrēowð* ‘unfaithfulness, treachery’, *untrēowe* ‘untrue, unfaithful’, *untrēowfæst* ‘unfaithful, unreliable’, *untrēowlice* ‘faithlessly’, *untrēownes* ‘unfaithfulness’, *untrēowsian* ‘to defraud, deceive; offend’.

*sōð* ‘true’

*sōð* ‘truth’, *sōð* ‘true’, *sōðe* ‘truly’, *sōðfæst* ‘true’, *sōðfæstian* ‘to justify’, *sōðfæstlic* ‘true’, *sōðfæstnes* ‘truth’, *sōðian* ‘to prove true’, *sōðlic* ‘true’.

Fig. 2. The major exponents for TRUE in Old English.

The minor exponents of the semantic prime TRUE include *tāwe*, *clāne*, *efen*, *eornost*, *forðcuman*, *hold*, *riht* and *wār*. Other exponents, such as *lēas*, *māne*, *swicende* and *swicol*, represent inverse exponents, a type of semantic explication (Goddard 2011). Unlike direct exponents of the type *trēow* ‘truth’, inverse exponents convey a meaning that results from the combination of the semantic prime of lexical negation (NOT, from the category of Logical concepts) and an opposite term (*truth-lie*, *tell the truth-lie*, etc.), thus NOT-TRUE corresponds to *false*. This is the case with the derivatives of the verbs *lēogan* ‘lie’ and *swīcan* ‘deceive’ as well as the adjectives *lēas* ‘false’ and *māne* ‘criminal’. In Fig. 3, the semantic map of the semantic pole TRUE in Old English is represented in two dimensions. Notice that inverse exponents belong in the area of the semantic pole that does not intersect either with the area of the semantic prime or with the areas of the exponents for the semantic prime. Furthermore, the areas of the exponents that do not overlap with the area of the semantic prime contain the derivatives with a looser semantic relation to the prime, like *fortrūwian* ‘to be presumptuous’, as well as the polysemous derivatives of the exponent for the prime, as is the case with *(ge)trūwa* ‘fidelity, faith, confidence, trust, belief; pledge, promise, agreement, covenant; protection’.

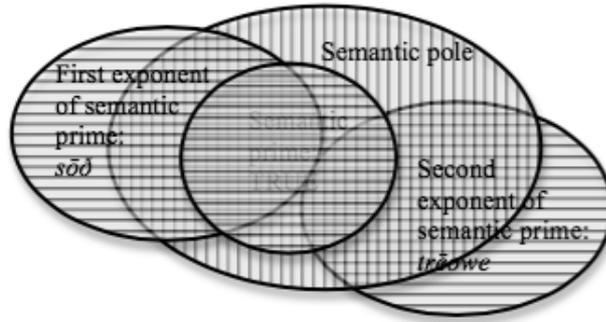


Fig. 3. The semantic map of the pole *sōð-trēowe* in Old English.

To recapitulate, semantic poles represented as in Fig. 3 are areas of semantic space that express a core meaning and consist of lexical nodes continuous from the semantic point of view. **This three-dimensional representation of semantic poles, which is unfolded in the following sections, has two clear advantages over 2D representations. Firstly, it can combine two variables of linguistic analysis, namely word-formation and polysemy, because both formal and semantic continuity find their way into the representation. For example, there is no formal continuity between the Old English major exponents for the semantic prime TRUE, *trēowe* and *sōð*, but there is formal continuity within their respective derivational paradigms. Secondly, the 3D model of semantic poles iconically reflects the neurophysiological basis of language and, moreover, constitutes a more efficient representation of semantic relations than a flat semantic map given that a larger number of units and relations can be displayed in a smaller space.**

#### 4. Method: Pole, definiens and definiendum

The data of analysis, retrieved from the lexical database of Old English *Nerthus* (Martín Arista et al. 2016), **which comprises nearly six thousand verbs, of which 1150 completely or partially expose the universal meanings conveyed by semantic primes.** The assignment of semantic pole and definiens to the definiendum has been done on the basis of the information provided by the standard dictionaries of Old English, including Bosworth and Toller (1973), Hall (1996) and Sweet (1976), **although some aspects of the grammar of the NSM have significantly contributed to more systematic and theoretically up-to-date meaning definitions than the ones available from the dictionaries cited above.**

Since this article focuses on verbal meanings, the semantic primes selected for analysis correspond to the categories Mental predicates (KNOW, THINK, WANT, DON'T WANT, FEEL, SEE, HEAR), Speech (SAY), Actions, events, movement, contact (DO, HAPPEN, MOVE, TOUCH), Location, existence, possession, specification (BE) and Life and death (LIVE, DIE). Notice that the semantic prime Be someone's (Goddard and Wierzbicka 2014: 12) is interpreted in this analysis as HAVE. Similarly, EXIST has been preferred over THERE IS (Goddard and Wierzbicka 2014: 12). BE subsumes 'to become' and the causal 'to cause to become'. It must also be borne in mind that semantic primes are not restricted categorially and, therefore, the adscription of these universal meanings to the lexical category of the verb is based exclusively on the class of verbs and their glosses.

These semantic primes provide the initial coordinates for locating the semantic poles in semantic space, although, as has been remarked above, it is often the case that the semantic space taken up by the semantic pole is wider than the semantic prime itself. This said, the inclusion of an Old English verb into the semantic space of a pole takes two steps. Firstly, the definiens of each semantic pole are listed. Definiens or meaning definitions have a deductive-inductive basis. While it is necessary to take the descriptive data into account, including the meaning definitions available from dictionaries of Old English, the configuration of definiens is guided by the syntactic properties of the semantic primes of the NSM, to wit, basic combinability, basic and extended valency and propositional complements (Goddard and Wierzbicka 2014). For example, 'to learn' combines with nouns and clauses, which usually perform an objective function with respect to this verb, and is frequently specified by propositional complements like 'by inquiry', 'by asking' or 'by reading', thus *ofācsian*, *āfindan* and *(ge)rādan*. There are no constraints on the number of definiens per semantic pole. For instance, 'to be angry', 'to become angry' and 'to make angry' fall within the scope of the semantic pole BE, while 'to order', 'to promise' and 'to summon' belong to the semantic pole SAY. Secondly, a definiens is assigned to each definiendum (an Old English verb that qualifies as a suitable candidate for inclusion into one of the semantic poles). For instance, *(ge)belgan* 'to be angry; to become angry; to make angry' is included into BE and *(ge)hātan* 'to order; to promise; to summon' into the semantic pole SAY. Through the relevant definiens, each definiendum has been attributed to a maximum of three semantic poles, as can be seen in example (1).

(1)

*ācalan* ‘to die of cold’, DIE

*flōwan* ‘to flow’, MOVE

*flōwan* ‘to become liquid’, BE

*(ge)healdan* ‘to hold’, TOUCH

*(ge)healdan* ‘to possess’, HAVE

*(ge)healdan* ‘to inhabit’, LIVE

The patterns of polysemy that emerge after the application of this analytic method to the Old English data are presented and discussed in the next section.

## 5. Polysemy within and across semantic poles

As a general assessment, most verbs are polysemous, although this polysemy can be restricted to a given semantic pole or involve two or three poles. Most instances of polysemy within one pole occur in the semantic pole BE. This can be due to three reasons. The first is the core meaning conveyed by BE, **probably one of the most basic, frequent and widespread in many natural languages, as reflected by various constructions that include, among others, the copula, the pseudo-copula and the zero copula (Hengeveld 1986)**. The second is the existence of numerous weak verbs that, being derived from nouns and adjectives, have a stative meaning component. This is the case with the denominal weak verb *(ge)blōdgian* ‘to be bloodthirsty; to become bloody; to make bloody’; and the deadjectival weak verb *(ge)unrōtsian* ‘to be sad; to become sad; to make sad’, **for example**. The third reason for the relative weight of BE is the wide scope attributed to this semantic pole in this analysis, which, as has been noted, includes the stative, ingressive and **causal** meanings. This can be said of *cēlan* ‘to be cold; to become cold; to make cold’. This is consistent with the treatment of BE in the NSM, **which is comprehensive in order to accommodate the various copulative and pseudo-copulative phenomena that arise in cross-linguistic analysis (Curnow 1999)**. Fig. 4 presents a detail of the 3D representation of the semantic pole BE. Gephi Graph 0.9.1 Visualization and Manipulation software has been used.<sup>3</sup>





BE/MOVE

*āstyrian* ‘to be excited; to become angry; to stir up’

BE/SAY

*(ge)scīran* ‘to make known; to tell; to accuse’

BE/WANT

*beðurfan* ‘to be in want; to be necessary; to want’

MOVE/HAPPEN

*(ge)gān* ‘to go; to come; to happen’

SAY/DO

*(ge)dihtan* ‘to order; to dictate; to perform’

SAY/KNOW

*(ge)rādan* ‘to counsel; to read; to learn by reading’

SAY/HEAR

*(ge)scrīfan* ‘to decree; to appoint; to hear confession’

In simplex polysemy, comprising two semantic poles, BE is the most widespread semantic pole. In complex polysemy, which involves three semantic poles, the situation is different. Example (4) lists the patterns of complex polysemy found in this work, among which the semantic pole MOVE clearly stands out.

(4)

BE/MOVE/SAY

*āwendan* ‘to become; to turn again; to translate’

BE/MOVE/HAPPEN

*(ge)cuman* ‘to become; to come; to happen’

BE/MOVE/DIE

*(ge)feallan* ‘to fail; to fall; to perish’

BE/MOVE/HAVE

*onwendan* ‘to make worse; to turn; to deprive’

BE/SAY/KNOW

*(ge)wissian* ‘to make known; to declare; to teach’

BE/THINK/KNOW

*(ge)hogian* ‘to be anxious; to think; to understand’

BE/HAPPEN/EXIST

*bēon* ‘to be; to happen; to exist’

MOVE/HAPPEN/DO

*gegangan* ‘to go; to happen; to accomplish’

MOVE/HAPPEN/EXIST

*(ge)faran* ‘to fare; to happen; to exist’

MOVE/HAPPEN/DIE

*gefēran* ‘to go; to happen; to die’

MOVE/KNOW/TOUCH

*befōn* ‘to surround; to understand; to grasp’

KNOW/MOVE/DIE

*(ge)witan* ‘to know; to depart; to die’

KNOW/SAY/HEAR

*(ge)āscian* ‘to learn by inquiry; to ask; to hear of’

KNOW/SAY/THINK

*(ge)ðreodian* ‘to hesitate; to deliberate; to think over’

KNOW/FEEL/TOUCH

*ongietan* ‘to understand; to grasp; to perceive’

TOUCH/HAVE/LIVE

*(ge)healdan* ‘to hold; to possess; to inhabit’

When all the patterns of polysemy between semantic poles, both simplex and complex, are considered, it turns out that the poles MOVE, BE and SAY form a group of their own. Firstly, because they show polysemy with respect to one other, as in *āwendan* ‘to turn again; to become; to translate’. Secondly, because they establish patterns of polysemy with the semantic poles that correspond to most of the categories from the NSM inventory. The semantic pole MOVE presents polysemy with respect to Mental predicates (KNOW, WANT), Speech (SAY), as can be said of *geceorran* ‘to turn; to become; to translate; Actions, events, movement, contact (DO, HAPPEN, TOUCH), as in *gegangan* ‘to go; to happen; to accomplish’, *befōn* ‘to surround; to grasp; to understand’ and *(ge)faran* ‘to fare; to happen; to exist’; Location, existence, possession, specification (BE, HAVE, EXIST), as is the case with *onwendan* ‘to turn; to make worse; to deprive’; and Life and death (DIE), thus *(ge)witan* ‘to know; to depart; to die’. Polysemy also emerges between the pole BE and poles from Mental predicates (KNOW, THINK, WANT), thus *beðurfan* ‘to be in want; to be necessary; to want’ and



Fig. 6. Detail of the area of intersection between the semantic poles of TOUCH and KNOW.

Of the two types of forces that determine the configuration of semantic poles, centripetal and centrifugal forces, the poles BE and SAY share the characteristic of encompassing polysemy relations that hold mainly in the pole, thus being governed by centripetal forces. **Put differently, it turns out that centripetal forces prevail over centrifugal forces, which results in the modification of the meanings of the lexical nodes of the semantic pole.** This may be due to the wide semantic scope of the pole, which is probably the case with SAY, or the different internal aspects (stative, ingressive, **causal**), as can be said of BE. The semantic pole MOVE, on the other hand, seems to be governed by centrifugal rather than centripetal forces. **In other words, centrifugal forces overcome centripetal forces and the lexical nodes that are under the scope of other semantic poles are modified.** This may be the consequence of the relative specificity of the meaning of MOVE, which is restricted to motion, as well as the various shifts between non-figurative and figurative motion comprising, for instance, motion and state, as in *āstyrian* ‘to stir up; to be excited; to become angry’; motion and death, as in *(ge)feallan* ‘to fall; to fail; to perish’; motion and happening, as in *(ge)gān* ‘to go; to happen; to come’; motion and speech, as in *āwendan* ‘to turn again; to become; to translate’; motion and depriving, as in *onwendan* ‘to turn; to make worse; to deprive’; motion and accomplishment, as in *gegangan* ‘to go; to happen; to accomplish’; motion and existence, as in *(ge)faran* ‘to fare; to happen; to exist’; motion and contact, as in *befōn* ‘to surround; to grasp; to understand’; as well as motion and knowledge, as in *(ge)witan* ‘to know; to depart; to die’. **It turns out, therefore, that the more general the meaning of a semantic pole, thus BE and SAY, the more likely it is to exert centripetal forces and, conversely, the more specific the meaning of a pole, as is the case with MOVE, the more chances there are that it exerts centripetal forces on other poles.**

Overall, the meaning of movement as expressed by the semantic pole MOVE partakes in the highest number of complex polysemy patterns. Qualitatively, it combines with stative and dynamic meanings and, what is more, shifts from the expression of non-figurative motion to figurative meanings. MOVE, BE and SAY are the core of the verbal lexicon, considering the semantic space that they take up and, above all, the centripetal and centrifugal forces that produce simplex and complex polysemy originating in these semantic poles.

## 6. Discussion

Zalizniak (2008) proposes a formalised catalogue of semantic shifts or variations of meaning including the relations between two different meanings of a polysemous word on the synchronic axis and the relations between two meanings of a word on the diachronic axis. The semantic shifts described by Zalizniak (2008: 228) that affect the verbal lexicon include (-> means unidirectional, <-> stands for bidirectional and - indicates that the direction is uncertain): to grasp -> to understand; to turn -> to become; to be slow -> to dwell; to hope - to wait; to hear - to understand; to count -> to narrate; to count -> to consider; to find -> to consider; to say <-> to indicate. Old English is a witness to these semantic shifts, as can be seen in example (5).

(5)

a.

to grasp - to understand: *ongietan* ‘to grasp, seize; understand, learn, recognise, know, distinguish, judge, consider; see, perceive; discover; hear; feel, experience; know carnally’

to turn - to become: *(ge)weorðan* ‘to be, become, be done, be made, come to be, turn to, turn into; to come, get; to happen, take place, come to pass, befall, arise, settle; to get on with, please, agree; think of, occur to; to grow’

to hear - to understand: *ongietan* ‘to grasp, seize; understand, learn, recognise, know, distinguish, judge, consider; see, perceive; discover; hear; feel, experience; know carnally’

to count - to narrate: *(ge)tellan* ‘to tell, narrate, relate, state, announce, recount, state a case; to count, reckon, calculate, estimate, compute, number, enumerate; to think, consider, account, believe, esteem, value; to assign, ascribe; to argue; to charge against, impute to’

to find - to consider: *āgitan* ‘to find, find out, discover; to get, take away; to know, understand, consider’

b.

to be slow - to dwell: *(ge)bīdan* ‘to live; to stay, remain, continue, tarry; to wait for, await, expect, look for; to delay; to meet with; to find; to experience, endure, undergo, abide; to obtain, attain, reach; to possess’

to hope - to wait: *onbīdan* ‘to remain, wait; to wait for, await, expect; to attend upon; to abide’

to say - to indicate *(ge)scīran* ‘to make clear, say, tell, declare, make known; to distinguish, decide’

A distinction has been drawn between the verbs in (5a), which clearly express the meaning shifts listed by Zalizniak (2008), and those in (5b) because the latter are less direct witnesses to the shifts in question.

Vanhove (2008) lists some semantic associations for which clear reflexes in Old English can be found, such as the auditory sense and mental perception (hear > obey, understand: *(ge)hīeran* ‘to hear, listen, perceive, hearken; to follow, serve, obey; to grant; to accede; to be subject to, belong to; to hear judicially, try; to be informed about’) as well as sight and mental perceptions (see > understand, know: *(ge)sēon* ‘to see, look, behold; to observe, perceive, discern; to understand, know; to inspect, visit; to experience, suffer; to appear; to seem’).

The database of semantic shifts in the languages of the world (Bulakh et al. 2013) provides the Old English semantic shifts that appear in example (6).

(6)

To turn, rotate -> to become *awendan*

To turn, rotate -> to translate *awendan*

To show -> to teach *tæcan*

To work -> to plough *(ge)tilian*

To live -> to cultivate *(ge)būan*

To wait -> to remain, stay *(ge)bīdan*

Finally, Zalizniak et al. (2012) explain the shift to go away-> to die on the grounds of euphemism.

All things considered, previous literature has underlined semantic shifts that involve the following semantic poles: TOUCH-KNOW, TOUCH-THINK, TOUCH-FEEL, BE-LIVE, BE-HEAR, FEEL-KNOW, HEAR-KNOW, HEAR-THINK, SAY-KNOW, SEE-KNOW, SEE-THINK, MOVE-BE, MOVE-HAPPEN, MOVE-SAY, MOVE-DIE and LIVE-DO. This analysis has turned out other patterns of polysemy that, at least in Old English, comprise the semantic poles BE/HAPPEN, BE/KNOW, BE/DO,

BE/DIE, BE/SAY, BE/WANT, SAY/DO and MOVE/HAPPEN. Of the corresponding semantic primes, only MOVE and HAPPEN belong in the same category of the NSM, namely Actions, events, movement, contact. The semantic primes BE and HAPPEN, on the one hand, and BE and DO, on the other, belong to two different categories (Location, existence, possession, specification vs. Actions, events, movement, contact); BE and KNOW as well as BE/WANT fall into the categories of Location, existence, possession, specification and Mental predicates, respectively; BE and SAY are included into Location, existence, possession, specification and Speech, respectively; BE and SAY make reference to the abovementioned Location, existence, possession, specification and Speech; BE and DIE also involve Life and Death; and, finally, SAY and DO belong to Speech and Actions, events, movement, contact. To the extent that the categories of the NSM are based, among other things, on polysemy patterns, the inclusion of HAPPEN and MOVE into Actions, events, movement, contact is adequate for Old English, whereas the adscription of SAY and DO to two different categories (Speech and Actions, events, movement, contact) is less adequate from the perspective of this language given the emergence of polysemy between these two poles that can be ultimately attributed to the performative meanings of verbs that express the concept of doing things with words.

## **7. Conclusion**

In the representation of complex polysemy proposed in this article, lexical and semantic networks give rise to a three-dimensional structure governed by a dynamic concept of semantic space that integrates lexical nodes, semantic poles and semantic dimensions. On the descriptive side, the NSM semantic primes constitute a reliable starting point in the search for the nuclear concepts around which the lexical stock revolves, but further research is necessary to compile the full inventory of semantic poles, which, moreover, requires more cross-linguistic and language-specific research. On the applied side, the assignment of a meaning definiens, from the lexicological point of view, specifies the semantic universal and, from the lexicographical perspective, systematises the mini-lexicon or set of anchor terms that define the meaning of dictionary entries.

In the resulting semantic map, graphs link poles to definiens and lexical nodes, in such a way that the centrality of the poles MOVE, BE and SAY is indicated, quantitatively, by the number of edges and, qualitatively, by the distance between the pole that exerts the centrifugal force and the pole to which such a force is directed.

While the concept of pole seems to have the connotation of isolation and, in the context of this study, such a connotation could suggest that there is no contact between poles, the evidence indicates that, far from being isolated, there is considerable continuity between the poles. Such continuity can be represented as the result of forces that explain the polysemy holding among semantic poles. In Old English, BE and SAY seem to be governed by centripetal forces that produce remarkable polysemy in the pole, while MOVE exerts centrifugal forces on other semantic poles, the result of which is a number of polysemy patterns involving stative and dynamic verbs as well as non-figurative and figurative meanings.

To conclude, MOVE, BE and SAY lie at the very heart of the verbal lexicon of Old English, considering the semantic space that they occupy and the centrifugal and centripetal forces that produce polysemy originating in these semantic poles.

### **Notes**

1. Langacker (1987: 78), in a stance that can be traced back to Saussurean structuralism, holds that symbolic structures can be broken down into semantic and phonological structures, which occupy the same semantic space. From this perspective, this work engages in the semantic pole of symbolic structures. What is more, although there might be some points of contact between the semantic poles of constructions as defined, for instance, by Unterbäumen (2015), and the semantic poles of the lexicon, this research focuses on the lexical domain exclusively.
2. See Martín Arista (2012, 2013, 2014) on the paradigmatic analysis of Old English.
3. I should like to thank José Manuel Valle Melón and Álvaro Rodríguez Miranda, of the Laboratory for the Geometric Documentation of the Heritage of the University of the Basque Country, for their support and assistance with the visualization and manipulation software used in this research.

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