

A Semantic Account of the English Preposition FOR Based on a Cognitive Linguistics Framework

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Introduction

English prepositions have been found to pose tremendous difficulties for English learners (Jiménez Catalán, 1996; Munnich, 2002). These difficulties can have a debilitating effect on acquisition, as prepositions occur frequently in English, where they account for 12% of word class tokens and are thus more common than adjectives, adverbs, and pronouns (Francis & Kučera, 1982, p. 547). Indeed, prepositions are among the most frequently occurring words in English. For example, *of*, *in*, *to*, *for*, *with*, *on* and *at*, used as prepositions, are the 3rd, 6th, 10th, 12th, 15th, 18th, and 21st most common words respectively (p. 465).

The ubiquity and importance of English prepositions has spurred interest in developing adequate semantic accounts of this word class. As discussed by Tyler and Evans (2003), researchers have traditionally sought to account for the semantics of English prepositions from three general perspectives. A *homonymy perspective* assumes that English prepositions have various senses that are unrelated. This contrasts with a *monosemy perspective* according to which each preposition has a single highly abstract meaning. The *polysemy perspective*, on the other hand, assumes that prepositions have different yet related meanings.

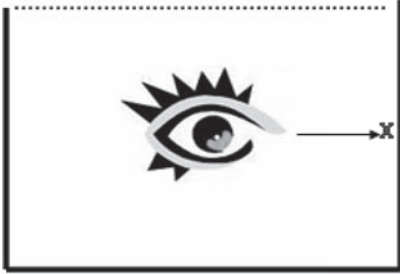
Polysemy accounts of prepositions tend to employ radial categories. Lakoff (1987) put forth the idea of radial categories

using, as one example, the polysemous Japanese classifier *hon*. His analysis revealed that while extensions of meaning within polysemy networks were motivated by a relationship between an original and extended sense, these extensions could not be predicted through any basic principles. He also demonstrated that meaning extensions, as they diverged from a core sense, often ceased to have a feature in common with some of the other senses within the network. In his view, related senses connect to the same network of representations, but are distinctly listed within that network¹.

In the Cognitive Linguistics (CL) theoretical framework, senses within a polysemy network are thought to be related to other senses in systematic ways, based on the relationships between the *landmark* (the background element of a scene), the *trajector* (the generally smaller, mobile, focal element of a scene), and the *vantage point* (the assumed perspective). In a typical meaning network of a preposition, a basic proto-scene gives rise to a polysemy network of distinct yet related meanings. To give an example of an analysis of a spatial scene, the perceptual accessibility sense of the spatial particle IN, which occurs in phrases such as *in view*, *in sight*, and *in earshot*, is based on a spatial configuration in which both the vantage point and trajector are situated in the interior of the landmark (Tyler & Evans, 2003, pp. 191-193). An iconic representation of the schema is shown in Figure 1.

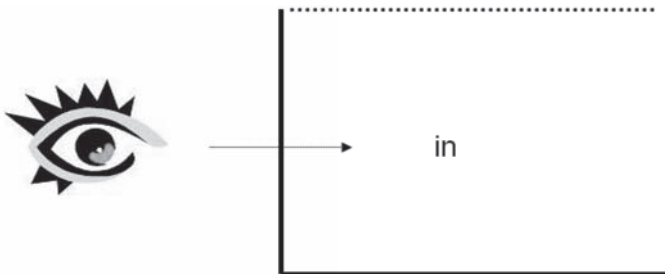
1 This conception of semantic representation has received some empirical support from recent brain research (MacGregor, Bouwsema, & Klepousniotou, 2015; Pylikkänen, Llinas, & Murphy, 2006)

Figure 1. Schema for perceptual accessibility sense of IN.



The disappearance sense of IN, on the other hand, is based on a distinctly different configuration in which the vantage point is situated outside of an opaque landmark and the trajector enters the landmark so as to disappear from sight (Tyler & Evans, 2003, p. 195). This sense appears in expressions such as *She rubbed the suntan lotion in*. This schema is shown in Figure 2.

Figure 2. Schema for disappearance sense of IN.



Semantic Analysis of Prepositions

The current study puts forth a semantic analysis of the polysemy network of the preposition FOR. Tyler and Evans (2003) put forth various methodological criteria for determining distinct senses of a polysemy network. First, each sense should involve

a different configuration of the trajector and landmark than that found in the proto-scene. Second, there must be instances in which the sense is context-independent and thus cannot be inferred based solely on the context of its occurrence. Partly based on earlier work by Langacker (1987), Tyler and Evans also list various indications that a sense has central status within a given polysemy network: (1) early appearance diachronically, (2) occurrence in composite lexical units (e.g., the use of *over* in its covering sense in *overgarment*), (3) occurrence of the sense as a key dimension distinguishing a contrasting set of items (e.g., *above*, *over*, *under*, and *below*), (4) traceability of all senses to the central sense, and (5) predominance within a network. Predominance is a vague criterion. One empirically verifiable aspect of predominance that appears in the semantic analysis of FOR presented in this paper involves speakers' tendency to assume that a given sense (i.e., a more central sense) is intended when a preposition is used in a decontextualized sentence (e.g., the meaning of *for* in *It's for her*).

The presence of a distinct sense can also be inferred from differing constraints. For example, only some senses of FOR require that the trajector have positive associations. This can be tested by employing the same trajector in a negative context to determine whether the ensuing sentence results in infelicity. Hence, *The hotel worker made up the bed for her* is acceptable, but *The hotel worker messed up the bed for her* is odd because FOR in this context is naturally construed as involving benefit (discussed below). The same constraint is not present for the situational valence sense of FOR (discussed below) as we can see from sentence pairs such as *This snack is good for kids* and *This snack is*

bad for kids.

The existence of irony, seen frequently in jokes, can also be used to infer the existence of multiple senses. Indeed, irony may provide important semantic insights if Giora's (1997) Graded Salience Hypothesis is correct. Giora, focusing primarily on the literal and figurative meaning of idioms, claims that senses are mentally accessed at different speeds due to their "salience." She defines salient meanings as those that are conventional, frequent, familiar, and enhanced by preceding context. Irony can appear when speakers initially process the more salient meaning of an expression and then subsequently process an intended meaning that is less salient. When conducting a semantic analysis, effects of irony may provide a highly useful insight based on the fact that any prepositional sense that is employed as the intended sense in a double-entendre context (in particular, one that is devoid of informative cues biasing interpretation) should have less psychological salience than the initially processed sense. Along these same lines, the existence of multiple senses can also be inferred from garden path effects, as seen in the following sentences:

Dorothy went shopping for a lion. She went to the butcher to get some meat.

Dorothy went shopping for a lion. She wanted to raise an exotic pet.

Furthermore, it should be noted that a key assumption when positing any sense is that the semantic content corresponds

to a psychologically plausible linguistic category. This can be determined in several ways. First, the sense should conform to the embodiment assumption (see Rohrer, 2007), meaning that it should be relevant to typical human interaction with the environment for typical human purposes. For example, a sense defined solely in terms of topological features (e.g., the often-encountered notion that the preposition AT signifies adjacency to a point) could be questioned on the grounds that the posited sense ignores the fact human beings' interaction with objects in space is strongly constrained by forces such as gravity, the reach and orientation of human limbs and sensory organs, limitations in the range of human senses, and so on. Second, the existence of a distinct sense as part of the linguistic repertoire of another language could be used to prove the sense's plausibility. This is so even if the sense is expressed via different parts of speech or via different means (e.g., as a syntactic pattern or as a morpheme). This will henceforth be referred to as the "crosslinguistic example criterion for plausibility."

Analysis of FOR

The following section will present an analysis of the basic senses of the preposition FOR. The analysis adopts insights from Tyler and Evans (2003), Tyler, Mueller, and Ho (2011), and Mueller (2012). The preposition FOR has been selected for analysis as it has been treated in depth only by a few researchers (Bennett, 1975; Herskovits, 1986; Tyler & Evans, 2003). Much of the analysis presented here is therefore new and speculative. For purposes of clarification, diagrams showing the landmark and trajectory have

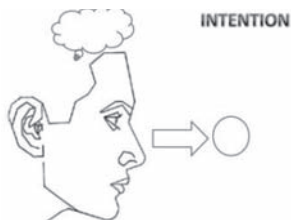
been provided for each posited sense.

Intention. The basic sense of FOR is related to intention or purpose (cp. Tyler & Evans, 2003, pp. 146-149). Prototypical collocates include *intended for*, *used for* and *tools for*. The basic schema is typically employed when a human being regards a trajector (often an artifact) as facilitative for some purpose (the landmark). The landmark does not need to be a goal, per se. Quite often, it simply picks out a relevant domain within which the trajector plays a facilitative role. For example, in the sentence *He was treated for a headache*, the headache is clearly not a goal or purpose, rather it is the domain for which the treatment was intended. This distinction is important as it constrains the felicity of FOR when it contrasts with similar sentences with a direct object in place of the preposition. For example, in the sentence *She searched the yard for her lost ring*, the yard is what's being searched but the ring is the actual purpose of the search.

When applied to reasoning processes, quite often the purpose is a justification related to the landmark. For example, in the sentence *He had no excuse for being late*, the excuse is a justification being applied to a particular domain (tardiness). Other examples would include *arguments for*, *explanations for*, *rationale for*, *reason for*, *strategies for*, and so on. The extension toward justification may also be motivated by FOR's ground sense discussed below. The considerable number of frequently occurring collocations involving the intention sense suggests that this sense is one of the most salient senses of FOR for native speakers (NSs). Iconically, this sense can be represented as in Figure 3 as a person

(a trajector) moving toward a landmark based on some purpose (represented by the thought bubble).

Figure 3. Schema for intention sense of FOR.



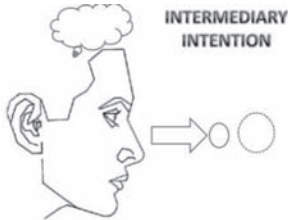
Intermediary intention. Especially when appearing with certain verbs of locomotion, FOR can highlight an immediate goal that is associated with a more general purpose (for a related discussion, see Bennett, 1975, p. 92; Tyler & Evans, 2003, p. 153). This will be treated as a peripheral sense here as it appears with less frequency within a narrow range of contexts. Examples include *bound for*, *dash for*, *head for*, *make a beeline for (the door)*, *move for (the exit)*, *race for*, *run for*, *scramble for*, *set sail for (a new land)*, and *start for (the door)*.

As Tyler and Evans (2003) show, FOR contrasts with TO in these examples in that TO implies reaching the landmark (e.g., *He ran to the hill and back*, versus *?He ran for the hill and back*). They further point out that FOR's implication of oblique intention makes it infelicitous when no intention is present (e.g., *The balloon floated to the ceiling* is acceptable, in contrast with, *?The balloon floated for the ceiling*).

It may further be noted that many of the examples involve haste and tend to highlight the initial phase of an action

(Lindstromberg, 2010; Tyler & Evans, 2003). This may explain the preference for TOWARD versus FOR in *He carefully and slowly crawled toward the door*. When haste and incipient action are implied, some verbs that do not refer directly to locomotion but simply involve movement are possible (e.g., *The gunslinger went for his gun*). Iconically, the sense can be represented as in Figure 4, which is similar to the intention sense except that the focus is on an intermediary goal (e.g., *the door* in *He ran for the door*), leaving the underlying motivation of the action (the larger circle) to be inferred (i.e., his running for the door was ultimately motivated by his desire to escape).

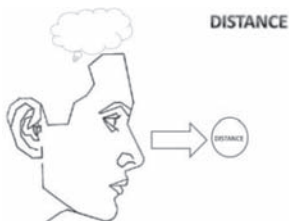
Figure 4. Schema for intermediary intention sense of FOR.



Distance. The distance sense appears to be related to the purpose sense. If someone *headed for Tokyo*, it is possible for them to view the act of traversing the distance (e.g., traveling 200 kilometers) as the purpose of the travel. This may have led to the development of a sense that can be glossed as *extent* (Bennett, 1975) or *distance*. The sense often appears with verbs describing locomotion (e.g., *She drove for many miles*). Iconically, the representation, shown in Figure 5, is similar to that of purpose except that the landmark is related to spatial distance and

intention is de-emphasized.

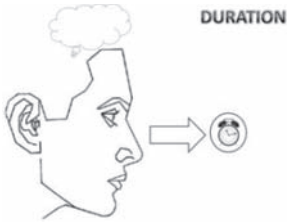
Figure 5. Schema for distance sense of FOR.



Duration. FOR is used to refer to the extent of a state or action through time (Bennett, 1975). It has important contrasts with IN in that FOR can force an atelic reading of an accomplishment verb (e.g., *He learned Japanese for a year* versus *He learned Japanese in a year*).² Empirical research would suggest that extension of meaning to temporal dimensions is based on spatial meaning (Boroditsky, 2000). Indeed, such extensions, which are commonly encountered in language (Clark, 1973; Gentner, Imai, & Boroditsky, 2002), represent the correlation between movement through space and movement through time (hence, the ambiguity in expressions such as *a long journey*). Some empirical evidence from patients with different types of brain damage provides evidence that the distance and duration senses can be dissociated (Kemmerer, 2005). An iconic representation of this sense (Figure 6) would resemble that of distance but with the focus now on time.

² For a related discussion, see Bennett (1975). Accomplishment verbs are telic and nonpunctual (Vendler, 1957).

Figure 6. Schema for duration sense of FOR.



Benefit. When someone acts with a specific purpose in mind and the purpose involves another person, it is often the case that the act is aimed at benefiting the other person.³ This leads to a distinct benefit sense in which some action, or an artifact associated with an action, often serves as the trajector associated with an animate landmark. Evidence for benefit as a distinct sense comes from the fact that the benefit sense, unlike the intention sense, is constrained to situations involving positive semantic prosody.⁴ Evidence for a distinct benefit sense, as opposed to a purpose sense, can be observed in the comical double-entendre evident in the following exchange:

Woman #1: Why don't you do something special for your husband on his birthday?

Woman #2: Yeah, right. After putting up with all of his

3 Tyler and Evans (2003) divided this sense into an “intended recipient sense” and a “benefactive sense” (p. 154). This division seems to be excessively fine-grained as the extension from one sense to another should be possible using inferences of a very general nature. For this reason, these two senses have been combined in the present analysis.

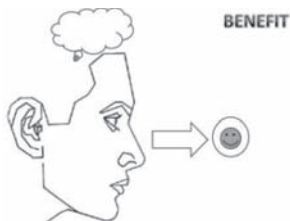
4 Louw (1993) defines semantic prosody as “a consistent aura of meaning with which a form is imbued by its collocates” (p. 157).

shenanigans this last year, I'm tempted to put some poison in a cake—just for him.

The humor in the exchange arises from the fact that FOR can be interpreted as benefit (i.e., the purpose is that he should enjoy it) or as intention (i.e., the purpose of baking the cake is that he—and not someone else—should eat it). As Lindstromberg (2010) points out, FOR, as opposed to TO, is linked closely with intention instead of movement. As observed in the sentences, *Why did you eat that cake? That piece was for him*, FOR can only be viewed as marking intention as the piece of cake in this example never made it to the intended recipient.

The benefit sense occurs with great frequency. Common examples include FOR used to mark roles of assumed benefit within professional situations (e.g., *She's an attorney for the firm*). Some uses of this sense appear to involve a folk theory about the benefits of positive mental energies (e.g., *Few would weep for Gaddafi, but targeting him wasn't right*). Collocations that involve this sense appear frequently in the American National Corpus (Reppen, Ide, & Sunderman, 2005), and the meaning seems to be central within FOR's semantic network. This would suggest that this sense of FOR is highly salient. This is furthermore suggested by an apparent preference to use the benefit sense as a default interpretation of FOR when reading vague sentences placed outside of context such as *He did it for her* or *Who's it for?* In the iconic representation of the sense (Figure 7), notice that the landmark is associated with positive benefit as depicted by the smiley.

Figure 7. Schema for benefit sense of FOR.



Proxy. In order to benefit another person, people commonly perform a task in their stead. In a sentence such as *Akiko taught the class for him*, the benefit derives from Akiko's acting as a substitute. When interpreting this sentence, the focus can either be on the benefit or the substitution itself. This has led to a distinct sense in which the beneficial aspect of the action is semantically bleached. In some cases, the proper identification of the proxy sense as opposed to a benefit sense is difficult as benefit can be implied (e.g., *She has sympathy for him*). However, many examples clearly have no sense of benefit (e.g., "*Ohayo*" is Japanese for "good morning," or *Do you take me for a fool?*). The contrast between proxy and benefit can be observed in the following sentences.

He taught for her. (She owned the school.)

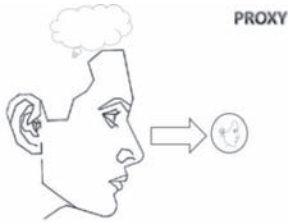
He taught for her. (She was sick that day.)

The second sentence remains somewhat ambiguous, but it is possible to further constrain the context so that only a proxy reading is possible. We can imagine a scenario such as the following: she hated to have anybody teach her class and understood that she would be fired when the school saw how

much better Hiroshi was at teaching, so she was enraged when she learned that he had taught for her while she was sick.

The iconic representation of the sense (Figure 8) shows that the trajector replaces the landmark in some way (e.g., by filling a role or function). Intention is often de-emphasized or absent (thus the dotted lines).

Figure 8. Schema for proxy sense of FOR.



Exchange. In many typical cases, a human being is performing an action while mindful of the potential benefit of the action to others.⁵ In other cases, human beings are not so altruistic and focus instead on envisioned compensation for their actions. This may explain the development of an exchange sense that is evident in sentences such as *He paid \$1000 for the car*, and so on. The proxy and exchange senses are so close in meaning that it may appear that they can be combined to achieve greater parsimony within the semantic account of FOR senses; yet it should be noted that it is possible to create sentence contexts that are ambiguous in terms of the two senses. For example, the sentence *He handed the*

⁵ The discussion of this sense closely follows analysis developed by Andrea Tyler.

money over for her could receive the following two interpretations, reflecting the proxy and exchange senses respectively:

He handed the money over for her (because she couldn't hand it over herself).

He handed the money over for her (because she'd been kidnapped).

The iconic representation of this sense (Figure 9) shows that the trajector's benefit often receives no focus or is absent (thus the faded smiley). The arrow indicates that the intention typically involves notions of reciprocity.

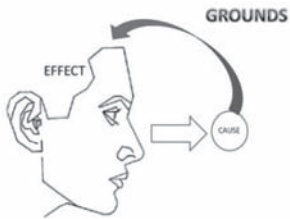
Figure 9. Schema for exchange sense of FOR.



Grounds. In typical exchanges, one party is motivated to give something as the result of having received something. In other words, the act of giving is the result and the act of receiving the cause. Through semantic bleaching, this may have led to a more abstract sense that simply attributes a result (the trajector) to a specific cause (the landmark). This sense figures prominently in the language of culpability (e.g., *arrested for*, *blamed for*, *caught hell for*, *charged for*, *fired for*, *held in contempt for*, *in prison for*, *penalties for*, *punishment for*, and *sued for*). Other examples would include

famous for, grateful for, hospitalized for, noted for, and renown for. The iconic representation of this sense (Figure 10) is similar to that of exchange except that the trajector and landmark elements now represent elements of a basic causal schema.

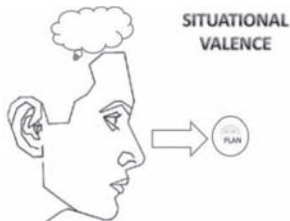
Figure 10. Schema for grounds sense of FOR.



Situational valence. The benefit sense implies that an action is performed while focusing on the possible benefit of an action. In some situations, it is possible to consider both the positive and negative effects of an entity, event, or general situation on an ideal conception of affairs. For example, the sentence *Junk food is bad for children* states that a trajector (junk food) hinders the landmark (i.e., the plans and hopes) that people typically have for children. Likewise, the sentence *This job would be good for John* refers to a conception of some ideal situation regarding John. If the sentence is turned around to read *John would be perfect for this job*, it suggests that the speaker has some ideal conception of the state of affairs regarding the job (which is now the landmark). Unlike the benefit sense, the situational valence sense allows for trajectors with both positive and negative prosody. The iconic representation (Figure 11) shows that the idea of benefit has given way to a general notion of an ideal state of affairs. The erased

lower half of the smiley shows that the sense allows for both positive and negative prosody.

Figure 11. Schema for situational valence sense of FOR.

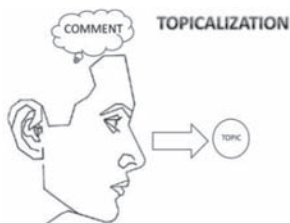


Topicalization. Semantic bleaching of the situational valence sense leads to an extremely general schema that is similar, in many ways, to the differentiation between topic and comment. The comment, in this sense, serves as the trajector, which is understood within the general context of the landmark. This sense appears in sentences such as *The team's tied for last place*, *It's common for there to be storms in this area*, and *I'm late for work*. Quite often, this sense picks out a specific dimension of a situation as the particular domain of relevance (e.g., *He looks young for his age*, *That's normal for this time of year*, and *The nozzle may be adjusted for height*).⁶ The iconic representation of this sense (Figure 12) is similar to that of situational valence except that intention has given way to the more abstract notion of a comment and the

⁶ Lindstromberg (2010) glosses this as “in relation to a norm” and gives the example, “For a woman of 90, she’s very active.” This “in relation to a norm” sense would pass the crosslinguistic example criterion for plausibility, as it is associated with distinct constructions in other languages (e.g., *chikonun* in Korean).

landmark is now simply a general topic.

Figure 12. Schema for topicalization sense of FOR.



Expected response. In some situations, actions performed with a specific intent in mind involve agents who can be expected to respond in a prototypical manner. For example, a person calling a doctor can assume that the doctor will not remain completely passive and will respond in some typical way. In these limited circumstances, FOR may be used to mark this expectation (A. Tyler, personal communication, July 1, 2010). Typical examples include *appeal for*, *ask for*, *beg for*, *demands for*, *gesture for*, *plea for*, *proposal for*, *request for*, and *signal for*. The human actors that fill the landmark slot (e.g., doctors, the fire department, and the police) tend to be associated with prototypical responses. This explains the infelicity associated with the fourth sentence below:

1. He called the police.
2. He called for the police.
3. He called his neighbor.
4. ?He called for his neighbor.

When abstract actions are associated with the landmark, they often directly refer to the response (e.g., *He called for help*, and *This abhorrent action has led to demands for a prompt response*). The sense typically appears with verbs of communication. Iconically, the sense is represented as in Figure 13 by a landmark element that is capable of responding in a typical manner based on the trajector's intention.

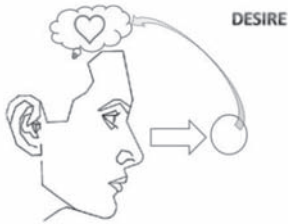
Figure 13. Schema for expected response sense of FOR.



Desire. In some situations, the focus can shift from the response to the desire for a response (A. Tyler, personal communication, July 1, 2010). In the sentence *She's longing for a visit from her son*, the desired visit can be viewed as a response to the longing; however, because the person's desire is not necessarily expressed, the response cannot be directly attributed to the emotion. This sense is evident in the following phrases and sentences, *He's spoiling for a fight*, *I'm hungry for something different*, and *She's desperate for a job*. This sense can also subsume what Lindstromberg (2010) refers to as the support (e.g., *He's for the measure*) and choice (e.g., *opt for change*) senses of FOR (p. 224)⁷ as these uses also highlight a yearning associated with the trajector. Iconically, the representation (shown in Figure 14) is

similar to that of expected response except that the response is usually semantically bleached (the white arrow) and the focus has shifted to the trajector’s emotional state (the heart). It may be plausibly argued that rather than representing a separate sense, the use of these emotion-related words with FOR are based on a folk theory of emotions (for a related discussion, see Kövecses, 2010, Ch. 7) in which the emotion is the initial step in a causal chain culminating in behaviors that achieve the desired effect. If this position is adopted, the desire sense can be subsumed under the intention or, in some cases, under the grounds sense.

Figure 14. Schema for desire sense of FOR.

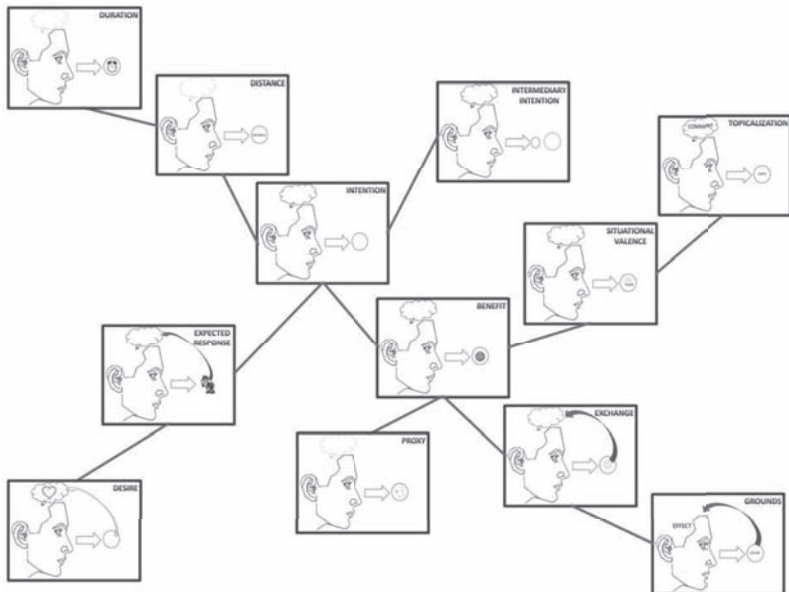


Polysemy network of FOR. The polysemy network for FOR is shown in Figure 15. The network is not intended to capture

7 Lindstromberg’s list of senses, designed for completeness and pedagogical utility, is arguable too large and theoretically unconstrained. He also does not distinguish between motivations for literal versus intended meaning. For example, he includes, “What I wouldn’t give for a beer!” as an “object of emotion” sense similar to the sense of FOR in “hate somebody for having done something.” The beer example clearly appears to be derived from its literal meaning based on exchange, which Lindstromberg, incidentally, also lists, glossing it as “compensation.” Alternatively, Lindstromberg’s support sense may be associated with the benefit sense depicted in Figure 7.

diachronic development.⁸ Instead, it shows how the senses are likely to exist synchronically in terms of their closely related schematic structure.

Figure 15. Polysemy network of FOR.



8 FOR is different from many English prepositions in that the original sense has disappeared (Tyler & Evans, 2003). It should also be noted that patterns of diachronic development have been found to be poor predictors of L1 acquisitional patterns (Rice, 1999). This is likely to be true as well for L2 learners, who, in addition to being affected by the relative salience of various senses, are additionally affected by L1 transfer.

Conclusion

The current analysis of FOR is both incomplete and tentative. One possible criticism is that it posits a considerable number of senses and is thus overly unconstrained. In defense of the current approach, it may be mentioned that semantic accounts, while being sensitive to Occam's razor, must also be adequately narrow (i.e., must avoid positing a small number of overly general senses) so that they do not predict preposition use that is clearly unacceptable. Positing a large number of senses may be the only path to achieving this.

References

- Bennett, D. C. (1975). *Spatial and temporal uses of English prepositions: An essay in stratificational semantics*. London, UK: Longman.
- Boroditsky, L. (2000). Metaphoric structuring: Understanding time through spatial metaphors. *Cognition*, 75(1), 1-28.
- Clark, H. H. (1973). Space, time, semantics, and the child. In T. Moore (Ed.), *Cognitive development and the acquisition of language* (pp. 28-63). New York, NY: Academic Press.
- Francis, N., & Kučera, H. (1982). *Frequency analysis of English usage: Lexicon and grammar*. Boston, MA: Houghton Mifflin.
- Gentner, D., Imai, M., & Boroditsky, L. (2002). As time goes by: Evidence for two systems in processing space time metaphors. *Language and Cognitive Processes*, 17(5), 537-565.
- Giora, R. (1997). Understanding figurative and literal language. The graded salience hypothesis. *Cognitive Linguistics*, 7(1), 183-206.

- Herskovits, A. (1986). *Language and spatial cognition: An interdisciplinary study of the prepositions in English*. Cambridge, UK: Cambridge University Press.
- Jiménez Catalán, R. M. (1996). Frequency and variability in errors in the use of English prepositions. *Miscelanea: A Journal of English and American Studies*, 17, 171-188.
- Kemmerer, D. (2005). The spatial and temporal meanings of English prepositions can be independently impaired. *Neuropsychologia*, 43(5), 797-806.
- Kövecses, Z. (2010). *Metaphor: A practical introduction*. Oxford, UK: Oxford University Press.
- Lakoff, G. (1987). *Women, fire, and dangerous things: What categories reveal about the mind*. Chicago, IL: University of Chicago Press.
- Langacker, R. W. (1987). *Foundations of cognitive grammar. Vol. 1, Theoretical prerequisites*. Stanford, CA: Stanford University.
- Lindstromberg, S. (2010). *English prepositions explained* (Revised ed.). Philadelphia, PA: John Benjamins.
- Louw, B. (1993). Irony in the text or insincerity in the writer? The diagnostic potential of semantic prosodies. In M. Baker, G. Francis, & E. Tognini-Bonelli (Eds.), *Text and technology* (pp. 157-176). Philadelphia, PA: John Benjamins.
- MacGregor, L. J., Bouwsema, J., & Klepousniotou, E. (2015). Sustained meaning activation for polysemous but not homonymous words: Evidence from EEG. *Neuropsychologia*, 68, 126-138.
- Mueller, C. M. (2012). *Comparison of an integrative inductive approach, presentation-and-practice approach, and two hybrid approaches to instruction of English prepositions*. (Ph.D.),

University of Maryland, College Park.

- Munnich, E. L. (2002). *Input and maturation in the acquisition of second language spatial semantics*. (Doctoral dissertation), University of Delaware, Newark, DE. ProQuest Dissertations and Theses (UMI no. 3046621) database.
- Pylkkänen, L., Llinas, R., & Murphy, G. L. (2006). The representation of polysemy: MEG evidence. *Journal of Cognitive Neuroscience*, 18(1), 97-109.
- Reppen, R., Ide, N., & Sunderman, K. (2005). American National Corpus (ANC) 2nd release. Philadelphia, PA: Linguistic Data Consortium.
- Rice, S. (1999). Patterns of acquisition in the emerging mental lexicon: The case of “to” and “for” in English. *Brain and Language*, 68(1-2), 268-276.
- Rohrer, T. C. (2007). Embodiment and experientialism. In D. Geeraerts & H. Cuyckens (Eds.), *The Oxford handbook of cognitive linguistics* (pp. 25-47). New York, NY: Oxford University Press.
- Tyler, A., & Evans, V. F. (2003). *The semantics of English prepositions: Spatial scenes, embodied meaning, and cognition*. Cambridge, UK: Cambridge University Press.
- Tyler, A., Mueller, C. M., & Ho, V. (2011). Applying cognitive linguistics to learning the semantics of English TO, FOR, and AT: An experimental investigation. *Vigo International Journal of Applied Linguistics*, 8, 122-140.
- Vendler, Z. (1957). Verbs and times. *The Philosophical Review*, 66(2), 143-160.