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Sense individuation

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In the first week of March 2013, immediately after the Italian parliamentary elections, the cover of the magazine *The Economist* bore a composite picture featuring Silvio Berlusconi and Beppe Grillo, under the caption *Send in the clowns*. Semantically speaking, lots of things are going on here. Both men are clowns in a derived sense only, if we take the literal meaning of *clown* to be "fool, jester, as in a circus or a pantomime; performer who dresses in brightly coloured unusual clothes and whose performance is meant to make the audience laugh". Grillo entered parliament as the leader of the anti-establishment Five Star Movement, but as he originally is an actor and a comedian, the relevant sense of *clown* could be paraphrased as "comic entertainer", i.e. as a slightly looser, more general reading of the central meaning. Berlusconi on the other hand is a clown in a figurative sense: his populist political antics characterize him as a man acting in a silly and foolish way – a metaphorical buffoon, in short. But while we readily recognize that *clown* applies in different ways to Grillo and Berlusconi, this creates a problem when we try to define the precise meaning of the word in *Send in the clowns*. The plural suggests that there is a single sense of *clown* that applies to both men, but then what would that meaning be, given the differences that we just discussed? Should we define a meaning at all that covers both "comic entertainer" and "metaphorical buffoon", or should we rather say that the simultaneous presence of two distinct senses underlies the punning effect of *Send in the clowns*?

From the point of view of semantic theory, this simple example illustrates a crucial methodological question: we perceive the differences between the three interpretations of *clown* – "jester in a circus or pantomime", "comic entertainer in general", "someone acting so silly as to make a fool of himself" – but what arguments exactly do we have to say that these are different meanings of the word, and how do we determine what the meaning is in the context of a specific utterance? How, in other words, do we establish the polysemy of a word, or any other linguistic expression?

This chapter introduces a major change that has taken place over the last quarter century in the way linguists think about the problem of polysemy. Roughly speaking, semantic theory has moved from a static conception of polysemy, in which senses are well-defined linguistic units (just like, say, phonemes or morphemes are discrete elements within the structure of a language) to a much more flexible and dynamic view of meaning. The chapter consists of three main parts. In the first part, we gradually zoom in on the central questions of polysemy research. We then present an overview of the arguments that have led semanticists to abandon a static conception of polysemy. In the third part, we have a look at the various

ways, theoretical and methodological, in which semantic theory has incorporated the new view. The chapter concludes on a prospective note: it will be argued that the challenge posed by the new conception of meaning has not yet been adequately answered but rather defines a research programme for further investigations.

1 Drawing distinctions

To get a grip on the issues involved in the study of polysemy, we first need to introduce two sets of distinctions: that between polysemy, vagueness, and ambiguity on the one hand, and that between utterance meaning and systemic meaning on the other.

1.1 Polysemy, vagueness, ambiguity

The first distinction is important because in linguistic semantics (and specifically in lexical semantics, which will be our main focus throughout the chapter), the concept of polysemy contrasts with the notion of vagueness. More specifically, the distinction between polysemy and vagueness involves the question whether a particular semantic specification is part of the semantic structure of the item, or is the result of a contextual, pragmatic specification. For instance, *neighbour* is not considered to be polysemous between the readings "male dweller next door" and "female dweller next door", in the sense that the utterance *our neighbour is leaving for a vacation* will not be recognized as requiring disambiguation in the way that *she is a plain girl* does. In the latter case, you may be inclined to ask whether *plain* is meant in the sense of "ugly" or "unsophisticated, simple". In the former case, you may perhaps wonder whether the neighbour in question is a man or a woman, but you would not be inclined to ask something like: "In which sense do you mean *neighbour* – male neighbour or female neighbour?" The semantic information that is associated with the item *neighbour* in the lexicon does not, in other words, contain a specification regarding gender; *neighbour* is vague (or "unspecified", as is sometimes said) as to the dimension of gender, and the gender differences between neighbours are differences in the real world, not semantic differences in the language. This notion of *conceptual underspecification* has to be kept distinct from three other forms of semantic indeterminacy. Since at least some of these alternative forms of indeterminacy may themselves be referred to as *vagueness*, we need to be aware that the discussion of vagueness (as contrasting with polysemy) is beset by terminological pitfalls.

First, conceptual underspecification as just illustrated differs from the *referential indeterminacy* that may characterize the individual members of a category, as illustrated by a word like *knee*. It is impossible to indicate precisely where the knee ends and the rest of the leg begins, and so each individual member of the category *knee* is not discretely demarcated.

Second, referential indeterminacy may relate to entire concepts rather than just their individual members. Such *categorical indeterminacy* involves the fuzzy boundaries of conceptual categories, as illustrated by any colour term. In the same way in which we can think of the category *knee* as the set of all real and possible knees, we can think of a colour like *red* as the set of all individual hues that could be called *red.* But then, it will be very difficult to draw a line within the spectrum between those hues that are a member of the category *red* and those that are not: where exactly does the boundary between *red* and *orange* or *red* and *purple* lie (see Chapter 7)?

Third, the conceptual underspecification of individual meanings differs from the *interpretative indeterminacy* that occurs when a given utterance cannot be contextually disambiguated. For instance, when the intended interpretation underlying *she is a plain*

girl cannot be determined on the basis of the available information, the interpretation is indeterminate, and the utterance is said to exhibit ambiguity. Ambiguity, in other words, may result from contextually unresolved polysemy.

1.2 Utterance meaning and systemic meaning

A second distinction that is necessary to get a clear view on the problem of polysemy is that between meaning at the level of the linguistic utterance, and meaning at the level of the linguistic system – between the meaning, in other words, that is a stable part of the system of the language, and the meaning that is realized in the context of a specific speech situation. In a simple model, the distinction between polysemy and vagueness coincides with that between utterance meaning and systemic meaning. As the case may be, in the actual situation in which the sentence is uttered, *our neighbour is leaving for a vacation* might call up the idea of a man or a woman, when all involved know who is being talked about. But although the concepts "male dweller next door" or "female dweller next door" would then indeed be activated in the context of the utterance, we would still not say that they add to the polysemy of *neighbour*. We could call "male dweller next door" or "female dweller next door" the utterance meaning of *neighbour*, but the systemic meaning would just be "person who lives next door": the systemic meaning belongs to the level of semantics, the utterance meaning to the level of pragmatics.

Does this imply that we can forget about utterance meaning? In the Saussurean, structuralist framework, the core of linguistic enquiry is the system of the language, and in the Chomskyan, generative framework, it is the mental representation of language, the way language is represented in the mind. So both of these traditions (and they are, apart from the post-Chomskyan functional-cognitive approaches, the dominant traditions in the history of contemporary linguistics) naturally favour focusing on systemic meaning. But while there may be a traditional theoretical motivation for looking at systemic meanings alone, methodologically speaking this can only be maintained if we have direct access to the mental lexicon. Some theorists do indeed assume that we can introspectively establish the meaning of linguistic expressions, at the level of the linguistic system. A highly articulate voice in this respect is Wierzbicka's (1985 and multiple other publications; see Chapter 25 for more discussion). She argues that to state the meaning of a word, one must introspectively study the structure of the concept that underlies and explains how the word can be used, and to understand the structure of the concept means to discover and describe fully and accurately the internal logic of the concept, through methodical introspection and thinking, rather than through experimentation or empirical observation of the scope of application of the item. To the extent that they understand language, language users have direct, unmediated access to the meaning of the linguistic expressions. The method of semantics, then, consists of attentively tapping into that immediate knowledge.

Such an idealist methodological position needs to be treated with caution, though (for a more extensive discussion of criticism voiced with regard to Wierzbicka's views, see Geeraerts 2010: 127–137). First, as a rather down-to-earth rebuttal, we may consider the way in which such an introspective exercise would actually work. In practice, one would likely imagine different contexts in which the targeted expression is used, and determine the definition of the word on that basis: if you want to know what *clown* means, you imagine circumstances in which you would use the word, and try to find a common denominator for those usages. But that, of course, is basically a roundabout way of grounding the analysis in contextualized language use: rather than a direct access to systemic meaning or mental

representations, introspection then merely provides an indirect access to utterance meaning. Second, we could ask the question how an introspective method can be validated, i.e. how can we establish that it is a valid method, without simply assuming that it is? One possibility could be to compare the results of an introspective strategy with actual usage data: is the meaning that is intuitively identified the same that is activated in actual usage? But then again we would obviously be back to square one: we would again be using utterance meaning as a point of comparison, and we'd need to establish what those utterance meanings are.

So, unless we can be more convinced of the possibility of a direct access to systemic meaning, including utterance meaning in the investigation is a methodological prerequisite: utterance meaning is the primary observational basis of semantics.

2 Blurring the lines

The conceptual exploration in the previous section reveals that the sense individuation issue has two dimensions: the level at which the individuation takes place, and the criteria to be used for individuation. In this section, we take a closer look at each of these dimensions. First, we will see how a critical scrutiny of the traditional polysemy tests tends to blur the distinction between vagueness and polysemy. Second, we will show that a closer look at the levels of analysis has a similar result, i.e. to blur the distinction between utterance meaning and systemic meaning.

2.1 Polysemy tests

An examination of different basic criteria for distinguishing between polysemy and vagueness reveals, first, that those criteria are in mutual conflict (in the sense that they need not lead to the same conclusion in the same circumstances), and second, that each of them taken separately need not lead to a stable distinction between polysemy and vagueness (in the sense that what is a distinct meaning according to one of the tests in one context may be reduced to a case of vagueness according to the same test in another context). (See Geeraerts (1993) for a fuller treatment.) In general, three types of polysemy criterion can be distinguished.

First, from the *truth-theoretical* point of view taken by Quine (1960: 129), a lexical item is polysemous if it can simultaneously be clearly true and clearly false of the same referent. Considering the readings "harbour" and "fortified sweet wine from Portugal" of *port*, the polysemy of that item is established by sentences such as *Sandeman is a port* (in a bottle), *but not a port* (with ships). Anticipating on the discussion in section 3.2, we may say that this criterion basically captures a semantic intuition: are two interpretations of a given expression intuitively sufficiently dissimilar so that one may be said to apply and the other not?

Second, *linguistic* tests involve syntactic rather than semantic intuitions. Specifically, they are based on acceptability judgements about sentences that contain two related occurrences of the item under consideration (one of which may be implicit). If the grammatical relationship between both occurrences requires their semantic identity, the resulting sentence may be an indication for the polysemy of the item. For instance, the identity test described by Zwicky and Sadock (1975) involves "identity-of-sense anaphora". Thus, *at midnight the ship passed the port, and so did the bartender* is awkward if the two lexical meanings of *port* are at stake. Disregarding puns, it can only mean that the ship and the bartender alike passed the harbour, or conversely that both moved a particular kind of wine from one place to another. A mixed reading in which the first occurrence of *port* refers to the harbour, and the second to wine, is normally excluded. By contrast, the fact that the notions "vintage sweet wine from

Portugal" and "blended sweet wine from Portugal" can be combined in *Vintage Noval is a port, and so is blended Sandeman* indicates that *port* is vague rather than polysemous with regard to the distinction between blended and vintage wines.

Third, the *definitional* criterion (as informally stated by Aristotle in the *Posterior Analytics* II.xiii) specifies that an item has more than one lexical meaning if there is no minimally specific definition covering the extension of the item as a whole, and that it has no more lexical meanings than there are maximally general definitions necessary to describe its extension. Definitions of lexical items should be maximally general in the sense that they should cover as large a subset of the extension of an item as possible. Thus, separate definitions for "blended sweet fortified wine from Portugal" and "vintage sweet fortified wine from Portugal" could not be considered definitions of lexical meanings, because they can be brought together under the definition "sweet fortified wine from Portugal". On the other hand, definitions should be minimally specific in the sense that they should be sufficient to distinguish the item from other non-synonymous items. A maximally general definition covering both *port* "harbour" and *port* "kind of wine" under the definition "thing, entity" is excluded because it does not capture the specificity of *port* as distinct from other words.

The existence of various polysemy tests is nontrivial for two fundamental, interlocking reasons. First, the three types of criteria may be in mutual conflict, in the sense that they need not lead to the same conclusion in the same circumstances. In the case of autohyponymous words, for instance, the definitional approach does not reveal an ambiguity, whereas the Quinean criterion does. *Dog* is autohyponymous between the readings "Canis familiaris", contrasting with *cat* or *wolf*, and "male Canis familiaris", contrasting with *bitch*. A definition of *dog* as "male Canis familiaris", however, does not conform to the definitional criterion of maximal coverage, because it defines a proper subset of the "Canis familiaris" reading. On the other hand, the sentence *Lady is a dog, but not a dog*, which exemplifies the logical criterion, cannot be ruled out as ungrammatical.

Second, each of the criteria taken separately need not lead to a stable distinction between polysemy and vagueness, in the sense that what is a distinct meaning according to one of the tests in one context may be reduced to a case of vagueness according to the same test in another context. Without trying to be exhaustive, let us cite a few examples involving the linguistic criterion. Contextual influences on the linguistic test have been (implicitly or explicitly) noted by several authors. In fact, the recognition occurs relatively early in the literature on the subject. When Lakoff (1970) introduced the *and so*-construction as a criterion for polysemy, he argued that *hit* is ambiguous between an intentional and an unintentional reading, because *John hit the wall and so did Fred* would constitute an anomalous utterance in situations in which John hit the wall intentionally but Fred only did so by accident, or the other way round. Catlin and Catlin (1972), however, noted that the sentence could easily be uttered in a context involving imitation. A situation in which John hits his head against the wall after stumbling over his vacuum cleaner and is then comically imitated by Fred might very well be described by the sentence in question. Nunberg (1979) further drew the attention to sentences such as *The newspaper has decided to change its size*, which features intuitively distinct senses of newspaper ("management, board of directors" and "material publication").

Similar cases can be found involving coordination rather than anaphora. For instance, Norrick (1981: 115) contrasted the decidedly odd sentence *Judy's dissertation is thought provoking and yellowed with age* with the perfectly natural construction *Judy's dissertation is still thought provoking though yellowed with age*. If the coordination generally requires that *dissertation* be used in the same sense with regard to both elements of the coordinated

predicate, the sentences show that the distinction between the dissertation as a material product and its contents may or may not play a role. Cruse (1982) noted that none of the following series of sentences containing coordination produces feelings of oddity: *John likes blondes and racehorses – John likes racehorses and fast cars – John likes cars and elegant clothes – John likes elegant clothes and expensive aftershave – John likes expensive aftershave and vintage port – John likes vintage port and marshmallows*. Coordinating the first item in the series with the last, however, does produce an awkward sentence. So, while the awkwardness of *John likes blondes and marshmallows* would normally be taken as evidence for the polysemy of *like*, the pairings mentioned above suggest that there is a continuum of meaning rather than a dichotomy. Cruse concludes that readings that are close together can be coordinated without oddity, but if they are sufficiently far apart, they are incompatible. If this picture is correct, it does not make sense to ask how many senses of *like* there are: "There is just a seamless fabric of meaning-potential" (1982: 79).

From these and similar publications (Taylor 1992; Tuggy 1993; Kilgarriff 1997; Allwood 2003) it appeared, in other words, that the contextual flexibility of meaning may take radical forms: it does not just involve a context-driven choice between existing meanings, or the on-the-spot creation of new ones, but it blurs and dynamizes the very distinction between polysemy and vagueness. To come back to our initial example, Grillo is a clown in one sense but not in the other, and the reverse holds for Berlusconi, but in the right context, both seemingly incompatible senses can be combined.

2.2 Levels of analysis

The distinction between systemic meaning and utterance meaning may be made more specific in two ways: as a distinction between conventional meaning and occasional meaning, and as a distinction between stored meaning and derived meaning. If we look more closely into these two distinctions, it will become clear that they blur the equation of "polysemy versus vagueness" and "systemic meaning versus utterance meaning".

The distinction between conventional and occasional meaning was first made explicit by Hermann Paul at the end of the nineteenth century: the conventional meaning (*usuelle Bedeutung*) is the established meaning as shared by the members of a language community; the occasional meaning (*okkasionelle Bedeutung*) involves the modulations that the usual meaning can undergo in actual speech (1920: 75). If the "usuelle Bedeutung" is like the semantic description that would be recorded in a dictionary (fairly general, and in principle known to all the speakers of a language), then the "okkasionelle Bedeutung" is the concretization of that meaning in the context of a specific utterance. To mention just one of the examples listed by Paul, the word *corn* used to be a cover term for all kinds of grain, but was differently specialized to "wheat" in England, to "oats" in Scotland, and to "maize" in the United States, depending on the dominant variety of grain grown in each of these countries: the context of use triggers the specialized meaning. But crucially, there exists a dialectic relationship between language system and language use: occasional meanings that are used very often may themselves become usual, i.e. they may acquire an independent status. So, on the one hand, usual meanings are the basis for deriving occasional ones, but on the other, the contextualized meanings may become conventional and decontextualized. The clearest criterion for a shift from the occasional to the usual level is the possibility of interpreting the new meaning independently. If *corn* evokes "wheat" without specific clues in the linguistic or the extralinguistic environment, then we can be sure that the sense "wheat" has become conventionalized (see Chapter 15).

This dialectic relationship precludes a simple equation of "conventional meaning versus occasional meaning" with "polysemy versus vagueness". To the extent that occasional meanings are just easily traceable contextual specifications, they fall under the heading of "vagueness", and their relevance for linguistics is minimal. However, to the extent that occasional meanings might be on their way to becoming conventionalized, "conventional" becomes a graded notion: meanings may be more or less conventional (and hence, more or less interesting from the systemic point of view). More generally, if we want to get a good idea of language change, occasional utterance meanings cannot be discarded as in principle less interesting: all changes of conventions begin as occasional changes on the utterance level. (For a contemporary formulation of the interplay between system and usage in polysemy research, see Hanks 2013.)

The distinction between conventional meaning and occasional meaning takes a predominantly social perspective on language: it looks at what is common in a community of speakers, and how those common patterns change over time. By contrast, we may look at language as an individual phenomenon as represented in the head of the language user. Within such a psychological perspective (a perspective that has been dominant in contemporary linguistics ever since Chomsky's definition of language as a cognitive phenomenon), economy of representation is often mentioned as an important criterion: a mental representation of the language that is parsimonious is supposed to be superior, and more specifically, linguistic phenomena that can be derived by some kind of generative, rule-based mechanism need not be stored separately in the mental representation. Applied to semantics, this implies that meanings that can be contextually derived need not be mentally stored as such. For instance, *chocolate* has two meanings: "food made from cacao beans, with a brown colour and a hard but brittle substance" and "hot drink made from milk and powder containing chocolate (as defined before)". It could then be argued that in the context *a cup of chocolate*, the presence of *cup* automatically triggers the second interpretation. The pattern *a cup of* ___ assumes that a mass noun will fill the slot, and specifically, a mass noun referring to a liquid. The meaning of *chocolate* is then, so to speak, automatically liquefied. In terms of representation, if we know what *chocolate* means in its basic reading and what *a cup of* ___ demands of its slot filler, it would seem that it is not necessary to separately list the second meaning of *chocolate* in the mental lexicon: instead of selecting the meaning from a list of stored readings, the meaning is computed by applying the expectations that are activated by *cup* to the stored basic meaning of *chocolate*.

This kind of model, aiming at a parsimonious distinction between stored meanings and contextually derived meanings, appears in various theoretical quarters, from Ruhl's largely descriptive approach (1989) over Evans' version of cognitive semantics (2009) to Pustejovsky's formalized Generative Lexicon model (1995). Two problems are relevant in the present context.

First, how important is it really to keep listed meanings and derived meanings separate? A parsimonious approach makes a distinction between semantic information that is stored in the (mental) lexicon, and readings that are derived pragmatically, in context. But if we take into account language change, such a strict distinction between what is stored and what is derived cannot be preserved. Pragmatic, context-dependent meanings have to be able to permeate to the level of semantics, in the way in which Paul's *okkasionelle Bedeutung* can over time be promoted to the status of *usuelle Bedeutung*. This is not just a social process of conventionalization; it is also an individual psychological process: one of the cognitive phenomena to be accounted for is the fact that some uses of a word may become psychologically more salient than others. Such a process requires that a reading that is at one point pragmatically derived leaves a trace in the mental lexicon of the language user: language users remember hearing/reading or saying/writing it, and the more they use it, the more cognitively

entrenched it becomes. Just like in the case of conventional and occasional meanings, a strict separation between stored and derived readings (what Langacker (1991) refers to as the "rule/list fallacy") is difficult to maintain.

Second, even if we were able to strictly keep up the distinction, it would not help us with the problem of sense individuation. The distinction between stored meanings and derived meanings does not coincide with that between conventional meanings and occasional meanings, nor does it coincide with that between polysemy and vagueness. Even if the "hot drink" meaning of *chocolate* can be derived contextually, it is still considered a different reading (and a conventional one at that). In fact, it is precisely *because* it is considered a different reading that it makes sense to explore how it can be most economically represented, by listing it or by computing it. As a consequence (and this is a point that cannot be sufficiently emphasized), assuming a dynamic model of meaning distinguishing between listed and computed meanings does not as such solve the question how to distinguish vagueness from polysemy.

So, a closer look at the opposition between utterance meaning and systemic meaning brings to light that like the distinction between vagueness and ambiguity, it is not a strict dichotomy, and in addition, that care needs to be taken with equating it with the latter distinction. At the same time, the discussion reinforces the methodological idea that utterance meaning is the observational basis of polysemy research. If meanings at the level of the linguistic system are postulated to explain the appearance of utterance meanings, we have to be clear about those utterance meanings first. Theoretical models that incorporate a generative or inferential semantic mechanism in the linguistic system as such will have to be clear about the division of labour between stored and derived readings, but as long as it is not established on independent grounds what the total set of meanings is that has to be accounted for, it will be difficult to decide which meanings are going to be stored and which ones will be computed (or both), and by means of which mechanisms. If we want to build a theoretical model of a given phenomenon, we need a set of observations: if we want to know whether the food eaten by chickens influences the colour of the yolk of their eggs, we need to observe chickens with different diets, and in the same way, if we want to compare theoretical models of the mental lexicon (with different degrees of parsimony, with different derivational mechanisms etc.), we need an observational basis as a testing ground and a point of comparison.

3 Exploring the consequences

In the past two decades, the observed vagueness of the borderline between vagueness and ambiguity has contributed to two developments. Theoretically speaking, models of meaning were suggested that try to live up to the idea of systemic meaning as "meaning potential". Methodologically speaking, alternative forms for observing meaning and meaning differences were deployed.

3.1 Theoretical developments

The breakdown of the traditional model of systemic senses as discrete entities that are straightforwardly activated in usage led to the development of alternative models that try to capture the flexibility and fuzziness of meanings. A detailed presentation of these models is beyond the scope of this chapter: see Geeraerts (2010) for a full overview. Analytically speaking, three features constitute the basis of these models:

- *prototypicality effects*, i.e. the recognition that a distinction needs to be made between central and peripheral readings of an item (see Chapter 7);
- *schematicity*, i.e. the idea that the flexibility of meaning includes cases in which a distinction between readings that is relevant in one context is neutralized in another (as, for instance, in the example with which we started the chapter);
- *mechanisms of semantic extension*, i.e. the observation that the flexibility of meaning rests on specific ways of getting from an existing reading to a new one, like metaphor, metonymy, generalization, specification, similarity (see Chapter 15).

Of these three features, prototypicality on the one hand, and metaphor and metonymy on the other, have received most attention from researchers. From a sense individuation point of view, we may note that the influence of the classical model diminished only gradually. For instance, initial models like Brugman's (1988) for the semantic structure of *over* (a preposition that functioned as a rallying point for the comparison of different representational models) took the form of radial networks of very specific readings that were easily mistaken to have the same status as classical, discrete senses. But the nodes in such a network were not meant in the traditional way to begin with, and later studies like Geeraerts (1992) and Dewell (1994) emphasized that the dimensions underlying the various readings provide more insight into the structure of the category than the individual points in the network. Over time, a consensus seems to have grown that an adequate model corresponding to a nonclassical view of meaning takes the form of a structured feature pool from which subsets are selected or derived in a given context.

At the same time, no standard representational format has emerged, and the representational models generally do not address the sense individuation issue directly. Distinguishing between utterance meanings and systemic meanings, for instance, is not a central point of concern, nor is the way in which individual senses are to be identified made explicit. An exception in this respect is Tyler and Evans (2001), who formulate guidelines for the demarcation of senses as well as for the determination of prototypes. The procedure they suggest is at its core a variant of the definitional criterion mentioned above (to the extent that new senses are only to be posited when they are not already covered by a given sense). Although the proposal includes collocational behaviour (see below) as one of the criteria for distinguishing senses, it is not a full-fledged answer to the methodological challenge posed by the difficulties of the classical polysemy tests.

3.2 Methodological developments

The emergence of new models of polysemy (or perhaps we should use a neutral term like "semantic variation" to avoid the suggestion that we adhere to a clear distinction between vagueness and polysemy) was paralleled by shifts in the methodology of semantic research. To understand the importance of methodology, we may go back to the discussion of levels of analysis. We noted that a complete model of linguistic meaning cannot be achieved without systematic attention to differences in contextualized meanings as they appear in actual usage – a "usage-based approach" in the sense of Langacker (1991). But utterance meaning is clearly no more immediately transparent than stored meanings. Recall our opening example: it will not be easy to come up spontaneously with a definition of the meaning realized in *Send in the clowns*. Or consider the example *We are out of fruit*. We know that various features are associated with *fruit*: fruit is generally sweet, juicy, it is commonly used as a dessert, and technically it is the seed-bearing part of a plant. But it is unlikely that all those features are

activated in the mind when someone utters the statement *We are out of fruit*. In the context of *A lemon is a fruit*, only a subset of features is activated and conversely, others are backgrounded: a lemon is not sweet, and it is not used as a dessert. But how would that mechanism of foregrounding and backgrounding work in *We are out of fruit*? When you use that phrase when you are drawing up your grocery list, the idea of a certain type of food will probably be prominent in your mind, but apart from that, is the idea of fruit that you have in your head at that point so clear that you can ascertain whether the fact that fruits are dominantly sweet was on your mind or not? Or perhaps you weren't thinking of fruit in terms of an abstract concept with definitional features, but you were thinking of it in terms of a collection of things like apples, strawberries and bananas? But then again, is what passed through your head so clear that you would be able to tell without a doubt whether, for instance, oranges were part of the set you were thinking of (see Chapter 11)?

The difficulty of such direct, introspective analyses strengthens the need for indirect measures of meaning: instead of studying meaning directly, we can study the behavioural correlates of meaningful language use, and base our analysis on those. Three major perspectives for doing this have come to the foreground in the past two decades (see also Stefanowitsch (2010)): an experimental, a referential, and a distributional corpus-based approach.

(1) *Experimental research* (involving reaction time experiments, naming tasks, association tasks, similarity judgements, self-paced reading, lexical decision tasks, sentence completion, eye tracking, neuro-imaging etc.) constitutes the standard methodological paradigm in psycholinguistic research. Through the work of Rosch (1975) on category structure, this type of work had an indirect but considerable influence on the adoption of prototype models in linguistics (see Chapter 7), but linguists themselves only gradually moved to experimental and interdisciplinary studies of semantic issues. Linguistically, the approach is now most conspicuous in the context of research into metaphor, imagery, and embodiment (see Gibbs (2007), Bergen (2007)), more so than in the context of polysemy and prototypicality research.
(2) A *referential method* takes its starting-point in the objects or events that a linguistic expression refers to. For instance, Geeraerts et al. (1994) study Dutch clothing terms on the basis of images and pictures as may be found in magazines and the like. The items referred to by means of a given word are subjected to a componential description, and this description is then used to analyze the boundaries and the internal structure of the clothing words (see Chapter 12). So, for instance, the loanword *legging(s)* is analyzed by describing depicted leggings in terms of length, tightness, presence of a crease, material, function, and gender of the wearer. The frequencies and co-occurrences of these features allow the prototype and the range of the concept to be identified. A referential approach of this kind is so far relatively uncommon (see Anishchanka et al. forthcoming, (2015) for a further example).
(3) The *distributional corpus-based method* is without argument the most influential methodological innovation in linguistic semantics (see Chapter 6). Initiated in the 1980s by Sinclair's lexicographical work (Sinclair 1991), it now takes three main forms. (For a more extensive treatment, see Geeraerts (2010: 165–178, 263–266).) First, most directly related to the tradition pioneered by Sinclair, statistical methods are used for identifying semantically relevant contextual clues in the corpus (collocations, i.e. co-occurring words, and colligations, i.e. syntactic patterns). These distributional data are then usually interpreted manually to arrive at a semantic characterization of the words and expressions under investigation (see Stubbs (2002) for examples). Second, the "behavioural

profile" approach follows the converse path: the corpus utterances in which a word occurs are coded manually or semi-automatically for potentially relevant features, and statistical techniques are then applied to classify the occurrences into distinctive senses and usages. Various statistical techniques are used. For example, Grondelaers et al. (2002) apply a logistic regression analysis to the Dutch particle *er*, Gries (2006) uses hierarchical cluster analysis to group occurrences of the verb *to run* into different senses, and Glynn (2010) performs a correspondence analysis to visualize groups of occurrences of the verb *to bother*. Third, a "semantic vector space" approach as illustrated in Heylen et al. (2012) maximizes the use of quantitative techniques: both the identification of contextual clues and the clustering of occurrences into semantic classes based on those clues is done in a statistical way.

The relationship between these different methods is nontrivial. To a large extent, they seem to capture different, non-overlapping phenomena. The referential method, for instance, will work best for material objects, events, and processes, but a lot of the information that will be revealed by taking such a referential perspective may be absent from the corpus. The information that is encoded in texts is probably not all the information that language users rely on, and specifically, the kind of features that are prominent in a referential approach (like the shape of objects) may not be explicitly expressed in textual data. How easy, for instance, would it be to retrieve information from the corpus about the average length of leggings, or the dominant shades of a colour term like *navy*? In a similar way, at least some of the psycholinguistic experimental methods are able to gather information about on-line processing that is inaccessible to the off-line perspective of a referential or a distributional method.

It is no surprise, then, to see scholars switch to mixed and interdisciplinary methods. Particularly for the semantic analysis of constructions, the combination of corpus data and experimental data is an emerging trend (see Gilquin and Gries (2009)). But although these studies generally show a convergence of the different types of evidence, there is no reason to assume that this will be automatically the case. Schmid (2010), for instance, argues that corpus frequencies need not directly reflect the psychological entrenchment of linguistic expressions. The relationship between the three methods could thus also be one of conflict and not just complementarity. If we look at this possibility with some distance, divergences between the different methods should in fact not come as a surprise. Note to begin with that the three methodological perspectives are crucially similar to the three traditional polysemy tests we distinguished earlier.

- The definitional test resembles the referential approach, to the extent that it too primarily looks at the extralinguistic situation that is referred to by the words.
- The linguistic test, like the corpus-based distributional method, looks at syntagmatic patterns in which a word occurs (but with a much narrower scope than the contemporary corpus approach, to be sure).
- Like the logical test, the experimental psycholinguistic methods explore the subjectively cognitive understanding of the language user.

Given the similarity among the newer empirical methods and the older polysemy tests on the one hand, and the divergences among the three classical tests on the other, divergences among the three successor models (if we may call them that) will have to be seriously reckoned with. As such, an immediate challenge for polysemy research consists of a systematic comparison of the three methods.

4 Defining a programme

In the foregoing we saw, first, how the traditional tests for polysemy exhibit mutual divergences and contextual inconstancy, and so cast doubt on the stability of the distinction between vagueness and polysemy. Second, it became clear that a methodologically sound approach to the problem of sense individuation needs to get a good grip on utterance meaning, even if the goal is to capture systemic meanings. And third, the three traditional polysemy tests, which relied heavily on intuition, were each succeeded by a more sophisticated empirical approach that continues the perspective of the original test in a methodologically more solid manner. But we have no clear picture yet of the possible divergences among those three new approaches, or of the success they have in identifying utterance meanings.

A research programme follows from these conclusions, but it needs to be formulated with caution. If we were simply to ask which method is the best at identifying utterance meanings, we should be aware by now that formulating the question in that way may be deceptive. Validating the methods in a straightforward way is only possible if we have an independent way of identifying utterance meanings – but that was the difficulty to begin with. In addition, if we think of the various methods as tools for identifying precisely delineated utterance meanings, we may well be repeating the mistake that originally came with the traditional model of systemic polysemy. We have given up the idea of discrete systemic meanings, but aren't we still thinking of utterance meanings as clear and distinct entities? Methodologically speaking, we are trying to get a clear picture of utterance meaning, but what if the thing we try to picture is intrinsically unclear? Are we looking at something through a fog, or is the fog the thing we are looking at?

So let us go back to basics: what is it that we do when we describe semantic variation? Given that each utterance is different to begin with, what we are doing when we look for different meanings at the level of utterances is identifying equivalence classes, i.e. sets of utterances that are identical or near-identical from the point of view of meaning. But the equivalence classes that we find may be influenced by the method we use and the specific parameters we include in the application of that method. If we don't hypostatize meaning, then the research programme will have to address the following questions.

First, to what extent do the various methodological approaches correlate with each other? This is the question that emerged at the end of the previous section: under which contextual conditions and parameter settings do the different methods show divergence or convergence?

Second, what external phenomena do the resulting classifications of meaning correlate with? If a given method yields a specific set of equivalence classes among utterances, for which other aspects of linguistic behaviour is that specific classification relevant? For instance, it could be that a distributional analysis yields a classification of semantic verb classes that plays a significant role in the choice of auxiliaries with those verbs, whereas a classification resulting from experimental association data has explanatory value in a multimodal analysis of the spontaneous gestures accompanying language. These are imaginary examples, but the point will be evident: a large-scale exploration of such correspondences should be pursued.

Third, is meaning a unitary phenomenon? If there is no one-to-one correspondence between the results of the methods, we could say that there are aspects of meaning that are identified by method A and others that we measure with method B, but we will have to leave open the possibility that the phenomena under scrutiny will eventually be recognized as different entities altogether, rather than as different aspects of the same phenomenon.

To get a better grip on what is at stake here, we may refer to well-known examples from the exact sciences. On the one hand, meaning could be like light, which has to be conceived in terms of particles or waves depending on the kind of experiment with which its properties are investigated. In physical theory light is still, ontologically speaking, thought of as one thing, but under the perspective of different methods, different properties are foregrounded. How those apparently contradictory properties can be reconciled into a single theoretical model of light is another matter, but that difficulty does not detract from the fact that light is considered a unitary phenomenon. On the other hand, meaning could be like the notion of a vital force, which in large parts of pre-twentieth-century biology was believed to be a unitary principle of life underlying the full spectrum of biological phenomena. Within a reductionist biochemical framework, however, that spectrum is resolved in different, ontologically distinct systems, like metabolism and evolutionary selection, each with its own appropriate methods of investigation. The current situation in semantics could then be described as undecided between these two models: is meaning a unitary phenomenon appearing in different guises according to the perspective we take, or should it be broken down into a complex of distinct phenomena? The question is open for investigation: send in the semanticists . . .

Further reading

Geeraerts, Dirk 1993. Vagueness's puzzles, polysemy's vagaries. *Cognitive Linguistics* 4: 223–272. Systematic discussion of polysemy criteria, and the difficulties associated with them.

Tuggy, David 1993. Ambiguity, polysemy, and vagueness. *Cognitive Linguistics* 4: 273–290. Discusses the representational issues following from the difficulties faced by polysemy criteria.

Glynn, Dylan and Kerstin Fischer (eds.) 2010. *Quantitative Methods in Cognitive Semantics*. Berlin: De Gruyter Mouton, and Glynn, Dylan and Justyna Robinson 2014. *Corpus Methods in Semantics*. Amsterdam: Benjamins. Two representative collections illustrating contemporary methods in polysemy research (and semantics more broadly).

Hanks, Patrick W. 2013. *Lexical Analysis. Norms and Exploitations.* Cambridge, Mass.: MIT Press. Focuses on polysemy from the lexicographer's point of view.

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Related topics

Chapter 2, Internalist semantics; Chapter 5, Cognitive semantics; Chapter 6, Corpus semantics; Chapter 7, Categories, prototypes and exemplars; Chapter 11, Contextual adjustment of meaning; Chapter 12, Lexical decomposition; Chapter 15, Semantic shift; Chapter 29, Semantic processing.