Received: 5 July 2020 | Accepted: 29 July 2020

DOI: 10.1111/mila.12329

SOLICITED ARTICLE

WILEY

Polysemy: Pragmatics and sense conventions

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Polysemy, understood as instances of a single linguistic expression having multiple related senses, is not a homogenous phenomenon. There are regular (apparently, rule-based) cases and irregular (resemblance-based) cases, which have different processing profiles. Although a primary source of polysemy is pragmatic inference, at least some cases become conventionalised and linguistically encoded. Three main issues are discussed: (a) the key differences between regular and irregular cases and the role, if any, of a "core meaning"; (b) the distinction between pragmatic polysemy and semantic polysemy; and (c) the role of syntactic meaning in both generating and constraining polysemy.

KEYWORDS

core meaning, homonymy, metonymy, polysemy, pragmatics, semantics

1 | INTRODUCTION

Words typically have multiple related senses: For instance, the noun "line" has a different sense in each of the following phrases, although they are all recognisably related: "a line of people," "a washing line," "lines on a page," "lines on a face," "a line of business," "a fine line between hope and despair," "learn one's lines," and so on. And the same goes for the verb "run" in each of the following: "to run a mile," "to run a bath," "to run a business," "to run for president," "to run a tight ship," "to run the gauntlet." The "family" of related senses is often linguistically cross-categorial, as is the case for both "run" and "line": So there is a noun "run" which has

multiple related senses, themselves related to the verb senses just mentioned: "a run round the park," "a run in a stocking," "the school run," "a run on sterling," "give someone a run for their money," "in the long run," and so on. And the same goes for "line" as a verb: "to line a street," "to line a page" [= draw lines on it], "to line a coat," "to line one's stomach," "to line one's pockets," to give but a small subset of the distinct senses.

My focus in this paper is on the substantive, or "concept expressing," vocabulary (e.g., nouns, verbs, adjectives), that is, words that are characterised by their flexibility of sense and adaptability to new contexts of use, by the expandability of the class (recent additions are "google," "brexit," "satnav," "upskirt," "selfie," "vlog"), and by their capacity to oscillate between syntactic category types (e.g., "stone" is a noun, a verb, and an adjective). The contrast is with what is known as functional (grammatical) vocabulary (e.g., determiners, modals, quantifiers), items that are not flexible in meaning (not contextually modulated) and that form small closed classes which are not expandable and occupy fixed syntactic categories. The particular property of the substantive vocabulary that is at issue here is its flexibility of sense/concept expression in context, which is the basis of much polysemy, something that is largely lacking in the functional vocabulary or is at least rigidly circumscribed.[1]

The paper is structured as follows. In the next section, various distinctions are reviewed, both between polysemy and other lexical phenomena (monosemy and homonymy) and within the domain of polysemy (between regular and irregular cases, and among the kinds of relations that may hold within a family of senses: narrowing, broadening, metaphorical, metonymic). In Section 3, I discuss the question of whether polysemy is best treated as a semantic or a pragmatic phenomenon, that is, a set of stable conventionalised senses or a matter of occasion-specific context-sensitive inference. Whether any help in resolving this question is provided by criteria of theoretical parsimony is considered. In Section 4, I set out the relevance-theoretic position, according to which many instances of well-established (hence, arguably, semantic) polysemy have their origins in online pragmatic processes of ad hoc concept construction. This account is extended to cases of "lexical innovation," where a new word (as opposed to just a new sense) is created, based on an existing word, and may give rise to cross-categorial polysemy. The final section is a short overview of some of the key issues to be pursued in future research on polysemy, including the question of what linguistic constraints there are on its flexibility. There I attempt to situate polysemy in a broad picture of the human language faculty, one that respects the distinction between the narrow linguistic faculty (syntax and its interfaces) and the wider, more unruly "systems" of sense and usage conventions that grow up in a language community. This is an interdisciplinary paper, drawing on work in linguistics, the philosophy of language and experimental psychology.

2 | DISTINCTIONS: POLYSEMY/MONOSEMY/HOMONYMY AND KINDS OF POLYSEMY RELATION

There is a clear conceptual distinction between monosemy (the phenomenon of a word having a single sense) and polysemy (the phenomenon of a word having multiple senses). Empirically, however, polysemy is the norm and even new word coinages which start out as monosemous

[1]For instance, although modals like "may" and "must" can have root, deontic and epistemic meanings, they are not open to further creative uses as is the substantive vocabulary. However, prepositions seem to be a striking exception: closed class, syntactically rigid, but multiply polysemous (see, e.g., Rice, 1992; Tyler & Evans, 2001).

typically rapidly become polysemous (perhaps apart from some highly technical terms that remain within their circumscribed domain of use). Consider, for instance, the case of "laser," as discussed by Panagiotidis (2014): This was originally an acronym from "light amplification by stimulated emission of radiation" (coined in 1957). At that time, it had a single concrete sense, so was monosemous, but an online search now shows various new uses of "laser," some of which may eventually become stable established senses:

1. a. "to get one's tattoos lasered" (verb)
   b. "a laser stare," that is, a persistent and piercing stare (adjective)
   c. "throw a laser," that is, a straight and strong shot in baseball (noun)
   d. "Your laser love is like a heart attack" [Mark Bolan, song lyric] (adjective)

Here again, then, we have a family of related senses *across syntactic word classes* (noun, verb, adjective). And, although I will focus on monomorphemic words in this paper, polysemy also arises for morphologically complex words (and whole phrases). For instance, the word "transmission" has both a literal compositional sense and a non-compositional sense that is related to, but more specific than, the compositional sense: (a) "transmit + -tion" = ACT/RESULT OF TRANSMITTING, (b) GEARBOX (of a car). The same goes for each of the following (omitting the compositional senses now): "execution," LAWFUL KILLING; "proofs," COPY-EDITED VERSION OF A BOOK; "transformation," A KIND OF GRAMMATICAL OPERATION; "civilisation," AN ORGANISED HUMAN SOCIETY; "reading," AN INTERPRETATION (of a sentence, of a poem/novel, etc.) (see Borer, 2017). Monosemy is, at most, a short-lived initial phase when a word is newly coined and every substantive word either *is* polysemous or very soon will be.

Another conceptually clear distinction is that between two kinds of ambiguity, homonymy, and polysemy. Homonymy is the phenomenon of there being two (or more) distinct expressions with the same phonological realization but distinct unrelated meanings, for example, the form /bat/ with the animal sense and the same form /bat/ with the hitting instrument sense, or /coach/ for the people-carrying vehicle and for the person who tutors others. Polysemy, on the other hand, is the case of a single word (or linguistic expression) which has multiple related senses as in the cases of "line," "run," "execution," and "laser" mentioned above. The relevant difference here is not one of etymology, as it is in the work of lexicographers when they set up a single dictionary entry for a case of polysemy and two or more for a case of homonymy, but a matter of speakers' mental representations and apprehension of distinctness of words and of relatedness of senses. Even if the financial institution sense of /bank/ is somehow historically related to the pile-of-earth sense of /bank/ (Elbourne, 2011, p. 38), still speakers do not now see a connection but treat the two as distinct words whose phonology happens (apparently by chance) to coincide. From a diachronic perspective, an instance of homonymy may have arisen entirely accidentally or may have started out as an instance of polysemy with subsequent loss of apprehended sense connection and splitting of a single word into two. The opposite phenomenon also seems possible. Suppose, for instance, that a form /xyz/ denotes the beak of a certain breed of bird and also a particular kind of bracket used in assembling furniture, there being no historical connection between the two words, but it happens that the bracket has a beak-like shape and movement. Is this a case of homonymy (two words, with an accidental coincidence of form) or of polysemy (a single word with related senses)? In the end, as in the /bank/ case, this is a matter of individual speakers' lexical "knowledge"; if a speaker represents it as a single

lexical entry with two related senses, then it is a case of polysemy for them. There may be individual differences in particular cases: Perhaps for one person, the use of the form /mouth/ to denote the part of a river where it enters the sea is unrelated to its use to denote the facial feature of humans/animals (hence it is a case of homonymy), while for many people those senses are clearly related (so it is polysemy).

Given the ubiquity of polysemy, it is to be expected that homonymous words will also each be polysemous. That is clearly so in the case of the noun "bank-1" (with the financial meaning), which has different (but related) senses in, "The bank on the high street burnt down," "She relies on the bank of Mum and Dad," "No shoes in the clothing bank, please," "That extra teaching I did is in the bank for next year," "Those songs are part of our cultural memory bank," and so also for "bank-2" (with the sloping pile of material meaning) and for their corresponding verbs (for further details, see Harley, 2013).

A number of experimental studies indicate that the homonymy–polysemy distinction is highly manifest in online processing: (a) There is a word recognition advantage for polysemy but not for homonymy, that is, a polysemous word is recognised faster than a homonymous word (Klepousniotou & Baum, 2007; Klepousniotou, Pike, Steinhauer & Gracco, 2012); (b) for homonyms (e.g., bank/bank; coach/coach), an immediate decision between meanings is made, typically within 250 ms, while in polysemy, there is no immediate decision in favour of one sense over the others (Brocher, Foraker & Koenig, 2016; Frazier & Rayner, 1990; Frisson & Pickering, 2001); (c) for homonyms, there is a bias towards the most frequent/dominant meaning (modulo context), for example, the financial institution sense of "bank," while there is no such bias in the case of polysemy, for example, the food sense of "chicken" (Duffy, Morris & Rayner, 1988; Frisson, 2009; Klepousniotou, Titone & Romero, 2008). While the meanings of homonymous words compete with each other for immediate selection, for a polysemous word there is sustained co-activation due to mutual priming of the related senses, so that activation of all the senses survives for at least 750 ms (MacGregor, Bouwsema & Klepousniotou, 2015).[2] Thus, the psychologists who got these results maintain that the homonymy–polysemy distinction is psychologically real and that hearers/readers do not make an immediate commitment to a specific sense of a polysemous word, but first access a single "semantically underspecified" meaning for the word (Brocher et al., 2016; Frisson, 2009; Frisson & Pickering, 2001). Some then speak of a subsequent stage of context-driven "homing-in" on one of the specific senses (Frisson, 2009).

However, while some broad generalisations about polysemy can be made, it is important to recognise that it is not a uniform phenomenon. It may be regular or irregular, and there are several different kinds of relations that may hold between related senses, including (but perhaps not exhausted by) metonymy (e.g., "school" the institution, "school" the building, and "school" the teachers and/or pupils), narrowing (e.g., "transmission" the act/instrument/result of transmitting and "transmission" the gearbox), broadening (e.g., "hoover" a particular brand of vacuum cleaner and "hoover" for vacuum cleaners in general), and metaphor (e.g., "chicken" the animal and "chicken" the cowardly person). As Brocher et al. (2016, p. 1799) say "Polysemy is not homogenous" and different kinds of polysemy may work differently from each other (and so give rise to different experimental results). Let us start with the regular/irregular distinction. It has long been noted that there are many kinds of polysemy relations which are productive and for which a regular or semi-regular rule can be formulated: For example, container/

[2]See also Pylkkänen, Llinás, and Murphy (2006) for MEG evidence that supports the homonymy/polysemy distinction and, for a comprehensive survey of the experimental evidence, see Eddington and Tokowicz (2015).

contents (e.g., "He drank the whole bottle"); material/artefact (e.g., "glass," "tin," "paper," "chalk"); object/information (e.g., "book," "magazine," "DVD"); creator/work (e.g., "I've read Dickens"); place/event (e.g., "Waterloo," "Vietnam," "Woodstock"); and many others (Apresjan, 1973; Copestake & Briscoe, 1995; Dölling, 2020; Srinivasan & Rabagliati, 2015). Most of the examples mentioned earlier, however, are not instances of any kind of recurrent pattern of sense generation, for example, the senses of the word "line" in "a line of people," "lines on a page," "learn one's lines," "a line of business," or the senses of "run" in "to run a mile," "to run a bath," "to run a business," "to run for president," and so need to be accounted for by some other means than a productive rule or general knowledge about regularities in the world.

Turning now to the different kinds of relation that can hold between two senses of a polyseme. It is notable that the relation involved for the various examples of regular polysemy just given is one of metonymy, that is, of a salient close association or "contiguity" (in the world) between the distinct categories of thing denoted, for example, an institution and the building where its activities take place, a container and its contents, a place and an event that took place there, and so forth. This is not so for the irregular cases, which by and large, seem to involve a relation of some kind of resemblance between concepts or senses,[3] so a narrowing or broadening, or a metaphorical extension of sense (sometimes a relatively obvious resemblance, as between "a line on a page" and "a line of people," sometimes much less so, as in "a line of business"). There seems to be a general tendency here: Regular polysemy involves metonymic relations and irregular polysemy involves resemblance relations (including metaphor). There may, however, be some exceptions. For instance, take the so-called double function adjectives, for example, "cold," "warm," "hard," "soft," "bright," "dim," "smooth," "rough," and so forth, each of which has both a physical property sense and a human personality trait sense. This is a metaphorical relation—we perceive some similarity or equivalence between the physical and psychological properties, although exactly what that similarity is seems difficult to articulate (Asch, 1955). It may be that it is regular and productive, although it is hard to say what "regularity" amounts to in the realm of resemblance relations.[4] The class of words that name human body parts is frequently used metaphorically, but it does not conform to any regular pattern (cf., "hand" of a clock, "leg" of a table, "eye" of a needle, "mouth" of a river, and the myriad uses of the word "face"). In general, it seems to be in the nature of resemblances, as cognised by us, that they do not give rise to anything as systematic and concrete as the metonymy cases. Regarding the apparent alignment between metonymy and regularity, there are a few cases of metonymic relations which do not seem to be instances of a more regular pattern, for example, "tea" for the drink and for the afternoon snack that typically involves the drink, or very idiosyncratic cases like the verb "gaslight" (meaning, roughly, "to undermine psychologically") and the film called "Gaslight" from which it originated. Nevertheless, overall, the correlation of

[3]The notion of "resemblance" here is intended to be close to the notion of "interpretive resemblance" developed by Sperber and Wilson (1986/1995), that is, the two concepts/senses share implications, for example, the literal and the metaphorical senses of "angel" share implications concerning virtuousness and kind behaviour. The "feature" overlap model of irregular polysemy developed by Brocher et al. (2016) is getting at a somewhat similar idea of resemblance, I think.

[4]Conceptual metaphor theorists would tell us that this productive relation is a function of an underlying conceptual metaphor: <the psychological is the physical>, such that physical properties of concrete objects provide a source domain for understanding properties in the less directly perceptible psychological domain (Lakoff & Johnson, 1980). However, even if correct, this does not take us very far as it does not specify the nature of the resemblance and there is not always a psychological counterpart to a physical property, for example, "tall," "striped," "spotted," "protuberant," "raucous."

regularity with metonymy and irregularity with resemblance-based cases (metaphor and narrowing/broadening) is relatively strong and, for the purposes of this paper, I will assume it.

In their experimental work on polysemy, Klepousniotou and colleagues have noted two other interesting (probably correlated) differences between metonymic polysemy and metaphorical polysemy, one concerning participants' offline judgements of degree of relatedness of senses and the other concerning the online word recognition results for these two kinds of polysemy. Regarding the latter, although a polysemous word is generally recognised as a word significantly faster than a homonym is, among polysemous words those with metonymically related senses (e.g., "lamb," the animal and the meat)[5] were recognised faster than those with metaphorically related senses (e.g., "leg," of a person and a table). Summing up, Klepousniotou and Baum (2007) say: "[M]etaphorical polysemy seems to be somewhere in the middle between 'pure' homonymy and 'pure' polysemy (which is best exemplified by regular metonymic transfers)" (p. 7). (See also Klepousniotou et al., 2012 for ERP results that endorse processing differences between metonymic and metaphorical polysemy.)

Moving now to offline judgements of how closely related different polysemy senses are and to what this somewhat vague notion of "relatedness" amounts to. It has been observed that, when asked for assessments of relatedness, people tend to judge metonymically related cases as being more closely related than metaphorical cases.[6] The authors typically interpret this as a matter of degree of "semantic overlap" of senses, where metonymy makes for high overlap, metaphor for moderate overlap and homonymy for low overlap. This is odd because, typically, metonymically related cases, for example, lamb—animal/meat; book—content/tome; Vietnam—place/event, do not, in fact, have a common core meaning or set of overlapping semantic features. Consider the following from Klepousniotou et al. (2008): "By core representation, we mean specifically a memory structure encompassing all semantic features that are common across multiple senses of a polysemous word (e.g. for the word 'rabbit', a core representation might include [+animate, +farm animal, +edible, +meat]" (p. 1535). It is hard to know what to make of this, as patently this is not a *common* core or set of features *shared* by the senses: Lamb the animal (hopping in the field) is not edible and lamb the meat is not animate. Foraker and Murphy (2012) make a similar point about the metonymically related senses of "church" (a building and an organisation), remarking that although the senses are "clearly closely related," they have very few, if any, features in common: "buildings are not conceptually *similar* to organizations" (p. 407).

[5]Here I follow Klepousniotou et al. (and many others) in taking the animal/meat alternation as a case of metonymy, but a very different account is given by Falkum (2017) in which it is analysed in terms of pragmatic narrowing of a general count or general mass sense of "lamb" determined by count/mass syntax, so LAMB-MEAT is one possible narrowing of LAMB + mass and LAMB-WOOL is another. Other (rule-based) approaches to the mass-count alternation employ a "universal grinder" or a "universal portioner" (Copestake & Briscoe, 1995). See Frisson and Frazier (2005) for results showing that these count-mass alternations have a somewhat different processing profile from metonymies of the "book"-type, "school"-type and "lunch"-type, which are sometimes described as cases of "inherent" polysemy (Putejovsky, 1995; Cruse, 2004; Frisson, 2015; Vicente, 2018).

[6]For a table showing the relatedness ratings, see Appendix B of Klepousniotou et al. (2008). It indicates a continuum of (judgements of) relatedness, from no or low relatedness (homonymy) to high relatedness ("pure polysemy" often involving metonymy), with metaphor and other resemblance-related cases at various points in between. However, I note that several cases of "narrowing" (not a relation discussed in this experimental work) occur in the high relatedness group: For example, "home"—general sense and more specific nursing-home sense; "examination"—general sense and more specific educational-assessment sense. Thus, the fact that animal/meat alternations are judged to be highly related is compatible with both of the current competing analyses of this relation (see previous footnote).

The relatedness of these metonymic cases has to be captured in some other way than positing a shared core meaning and, since they are frequently instances of regular polysemy, it is often formulated by a (productive) rule, which, in effect, mediates a move from one sense to another: from an animal to its flesh/meat, from a container to its contents, and so forth (Copestake & Briscoe, 1995; Pustejovsky, 1995). Although the idea is clear and seems closer to the mark than any "core meaning" account, it raises a number of issues (see Blutner, 2002; Falkum, 2015, 2017), which I will not review here, except to say that, to the extent that these rules work, they seem to be generalisations about regularities of co-occurrence in the world, as we perceive them, so components of our general knowledge rather than lexical knowledge.[7]

Now, what about the *irregular* cases (typically involving relations of narrowing/ broadening, or metaphor): Does the idea of a core meaning (or shared features, or semantic overlap) work any better for these? Note that while, by and large, metaphorical cases are felt by native speakers to be less closely related to their literal counterparts than the regular/metonymic cases, a fair number of the irregular cases in Klepousniotou et al.'s list were, in fact, given high relatedness ratings, for example, "dream" in its sleep occurrence sense and its aspiration sense (e.g., "her dream of a modelling career"); "oil" in its general sense and its cooking sense; "examination" in its general scrutinizing sense and its more specific educational-assessment sense (Klepousniotou et al., 2008, Appendix B). Interestingly, these irregular "resemblance" cases do seem more amenable to receiving an account in terms of a shared component of meaning. In their study of irregular polysemy, Brocher et al. (2016, p. 1799) discuss two senses of the word "wire," namely, FLEXIBLE FILAMENT and LISTENING DEVICE which they say have the overlapping "semantic features": *metal, cylindrical, thin*, and perhaps others.[8] They describe these as "diagnostic features for this particular ad hoc relation," and go on to suggest that overlap of semantic features "could also apply to metaphoric polysemes, a subclass of irregular polysemy" (p. 1799). In their experiment, in which they compared the processing of homonymy and irregular polysemy, the examples of the latter that they used included the following (all resemblance-based cases, in my terms), the pair of senses in each case fairly clearly sharing certain salient properties/features:

2. "wire": (a) filament/cable; (b) recording device
   "belt": (a) for trousers; (b) in a car engine
   "shade": (a) as in light outdoors; (b) as for a colour
   "play": (a) general ludic sense; (b) activity in a game
   "clean": (a) free of dirt/dust; (b) free of drugs
   And some metaphorical cases:
   "cold': (a) temperature; (b) personality trait
   "sour": (a) taste of food; (b) personality trait
   "nest": (a) construction of birds; (b) human home
   "steam": (a) water vapour; (b) anger

[7]Recent work by some philosophers takes a different approach, treating these cases of regular metonymically related senses as, in effect, different manifestations of a single concept or meaning (Vicente, 2018; Ortega-Andres & Vicente, 2019; Pritchard, 2019; and the "generative concept" account of Quilty-Dunn, forthcoming).

[8]I use italics for semantic features (as do Brocher et al., 2016) and small caps for senses/concepts.

Somewhat ironically, then, the polysemies judged to have the highest degree of semantic overlap or relatedness (i.e., the regular cases) appear to share no or very few salient features, while those that are judged to be less closely related do seem to overlap significantly. Brocher et al.'s (2016) experimental results indicate that the processing of cases of irregular polysemy is in some respects like regular polysemy and in some respects more like homonymy. The "shared features" model that they develop is like the underspecified core meaning models (as proposed by Frisson & Pickering, 2001; Klepousniotou et al., 2008) in that it accounts for an initial stage of lexical access where there is no commitment to a specific sense. However, in the next stage of processing where a specific sense is recovered, there is a degree of competition between the competing senses (albeit to a significantly lesser extent than in homonymy). This model, then, captures the distinctive nature of irregular polysemy: (a) It involves related senses of a *single* word (unlike homonymy), but (b) it differs from cases of regular polysemy (also a single word) in that it is susceptible to effects of biasing context and of frequency differences between senses, neither of which affects the processing of regular cases (Brocher et al., 2016; Brocher, Koenig, Mauner & Foraker, 2018).

There has been a tendency when discussing the established senses of a polysemous word to assume that there are two broad possibilities for their mental representation: (1) a single representation, which may be a schematic core meaning, shared by all the senses, or an information-rich representation, subparts of which constitute the distinct senses; (2) a distinct representation of each sense listed separately in a so-called "sense enumeration lexicon," as for homonymy. Given just these two options, it is usual to model regular (metonymic) cases in the first way and irregular (resemblance-based) cases in the second way. This is an unfortunate outcome for the irregular cases, as it omits any indication of their (transparent) relatedness, thus rendering "oil," "wire," "clean" and the literal/metaphorical "disarm," "nest," and "cold" as two wholly distinct words, apparently as unrelated as the homonyms "bank"/"bank" or "bat"/"bat." What the fine-grained account of Brocher et al. shows is that there has to be a third option for cases of irregular polysemy, one which allows for the representation of a single word (or "lexical entry") within which the multiple related senses are registered as such, that is, as semantic entities, neither semantically underspecified not over-specified. This is the sort of approach I began to develop in Carston (2019), where the family of senses is represented as a single "polysemy complex" in a communicational lexicon.[9] However, the resemblance between senses which Brocher et al. talk of as "shared features" is construed somewhat differently, that is, as shared components of salient encyclopaedic information associated with the atomic concepts that comprise the related senses; this is illustrated below in Section 4 on the pragmatic derivation of one sense from another.

It is noticeable that many recent papers on polysemy, whether theoretical or experimental, focus exclusively on either the regular/metonymic or the irregular/resemblance-based cases, although they are not always explicit about this. So, for instance, the theorists who favour some version of a rich informational word meaning/concept view of polysemy are discussing just the regular metonymic cases (Ortega-Andres & Vicente, 2019; Quilty-Dunn, forthcoming; Vicente, 2018), while (for the most part) the experimentalists who argue for a shared features account of polysemy focus on the irregular resemblance-based cases (narrowing/broadening, metaphor) (e.g., Brocher et al., 2016; Brocher et al., 2018). Others point out differences in the processing profiles of the metonymic and metaphorical cases (Klepousniotou et al., 2008;

[9]The general approach is manifest in Langacker's (1991) insightful account of polysemy in terms of a network of senses (and relations between them). See also Recanati (2017).

Klepousniotou & Baum, 2007) and even of kinds of metonymy (Frisson & Frazier, 2005). It looks as if this is the right way to go, that different kinds of polysemy (regular or irregular, metonymic or resemblance-based, and subtypes of each of these) are represented and processed differently (as also suggested by Foraker & Murphy, 2012), so we should not expect to provide a detailed unitary account that covers all the various kinds of polysemy. In what follows, I will focus mainly on the resemblance-based cases (irregular polysemy), on how they arise, on the constraints on their generation, and on the cognitive status of those cases that become established/conventionalised.

Another characteristic of polysemy which seems important to me is its frequent cross-categorial nature (e.g., "stone" as noun, verb, and adjective, with related senses across these categories), something which is largely ignored in current studies of polysemy. While there is a small measure of regularity in these cases, simply by virtue of the constraint imposed by the syntactic category, for example, the switch from being a noun (a thing) to being a verb (an action or process), the relations between the noun sense(s) and the verb sense(s) are various and idiosyncratic. Consider, for instance, the relation of each of the following verbs to the corresponding noun: "to stone," "to dog," "to winter," and the difference in the relation between the noun "mother" and the verb "to mother," on the one hand, and the noun "father" and the verb "to father," on the other. Ultimately, a complete account of polysemy must accommodate its cross-categoriality, perhaps by attending to the meaning of the lexical root that a related noun and verb share (√stone, √dog, √mother, etc.), an issue that I cannot pursue in this paper, although it is touched on briefly in Section 5.

3 | POLYSEMY: SEMANTIC OR PRAGMATIC?

Before addressing the question of whether polysemy is a semantic or a pragmatic phenomenon, it is worth noting that this is not a question that arises for homonymy: The two meanings of the form /bat/ are clearly a matter of linguistic semantics, that is, of encoded word meaning. This is another pointer, then, to the polysemy/homonymy distinction being psychologically real and of theoretical significance, despite the observations of the psychologists mentioned in the previous section that there seems to be a continuum of degrees of relatedness of senses, with the likes of "lamb" (animal/meat) at the high end of relatedness and the likes of "bat" (animal/hitting instrument) at the low end.

It is important to note that the kinds of cases for which the "semantic or pragmatic?" question arises are uses that are well-established in the particular language community, cases where a word is regularly used,[10] as Devitt (2013a) puts it, to express that sense, as opposed to cases of new ad hoc senses, which are indisputably pragmatic.

3.1 | Two extreme positions: It is all pragmatic versus it is all semantic

There are different (non-equivalent) ways of drawing the semantics/pragmatics distinction,[11] but for the content words under discussion here, the right way to draw it seems clear enough: It

[10]Note that both cases of regular polysemy (e.g., the animal/meat alternation) and cases of irregular polysemy (e.g., resemblance-based cases) may be "regular" uses in this sense.

[11]At the sentence level, "semantics" may be equated with the linguistically encoded (expression type) meaning (e.g., Sperber & Wilson, 1986/1995) or with the propositional content resulting from conventional/encoded meaning plus context-specific indexical saturation and disambiguation (Grice, 1975; Devitt, 2013a, forthcoming.). The domain of "pragmatics" varies correspondingly (for discussion, see Carston, 2002).

is a distinction between conventionalised/encoded meanings or senses, on the one hand, and senses that are derived inferentially in context, on the other. The former are stored in some way in the mind (in a "mental lexicon") and retrieved from that store on occasions of use, while the latter are worked out in context on the basis of some other sense which has been directly retrieved. So, from the perspective of utterance interpretation, the question amounts to whether a sense is an input to pragmatic inferential processes or an output of those processes.

There are two clear (absolutist) positions on this question: (a) all senses of a polysemous word are pragmatically inferred (on the basis of some lexically provided single meaning, typically semantically underspecified), a position probably held by Ruhl (1989), and perhaps also by Frisson and Pickering (2001), Falkum (2015, 2017), among others. (I say "probably" and "perhaps" because, although this seems to follow from much of what they write, I do not think they would really reject the position that at least some pragmatically derived senses eventually become "conventionalised"); (b) all regularly occurring senses of a polysemous word are conventionalised, stored in the lexicon and activated/decoded when the word is used, the role of pragmatics being just to select the contextually relevant one, a position held by Lepore and Stone (2015), and Devitt (2013a, 2020, forthcoming), among others. I will argue for a third position: Some of the senses of a polysemous word are pragmatic (inferred in context), some are semantic (conventionalised, mentally stored, directly retrieved) and most of these latter are pragmatic in their origin.

An absolutist pragmatic position can be dismissed fairly swiftly. We humans have capacious memories, encompassing a vast array of general world knowledge and culture-specific assumptions and behavioural conventions. It is reasonable to suppose that at least some regularly occurring senses of words are also mentally stored, along with the non-compositional senses of myriad phrasal idioms and frozen collocations (Bolinger, 1976). However, Ruhl (1989) maintains that content words are linguistically *monosemous* and the different ways in which a word may be used and understood are entirely a function of context (linguistic and extra-linguistic), so polysemy is a matter of pragmatics. On this view, the lexical meaning of a word is an abstract, unitary schema, which is common to all the actual uses and is typically underspecified along multiple dimensions (e.g., concrete/abstract, static/dynamic, causal/noncausal, etc.) which become specified in contexts of use. For instance, after a detailed analysis of a large corpus of occurrences of the verb "bear," many of which seem to differ in their sense, for example, "That chair won't bear John's weight"; "He bears a scar on his arm"; "She bore three sons and two daughters"; "His theory bears close examination"; "I cannot bear his rudeness"; and dozens of others, he considers the question what the verb "bear" means. The answer he gives is that, although it certainly has a single meaning that underlies all the different senses it acquires in contexts of use, that meaning cannot be articulated: "General abstract meanings elude consciousness; the interpretations of the conscious mind by necessity are oriented toward reality, and thus are not purely semantic, but compounds of both semantic and pragmatic. The general abstract meaning is unconscious, providing the foundation for more specific conscious distinctions" (Ruhl, 1989, p. 51).[12]

[12]Ruhl's data and analyses are compendious and detailed. Confronted with the reality of the many subtly different uses of "bear" (and the other cases he discusses, including some nouns, for example, "ice"), the issue of sense individuation looms large, as many of the differences, although perceptible, are tiny and seem to fall together into broader classes (e.g., uses of "bear" that can be very roughly paraphrased as "carry" or "tolerate" or "produce"). This is where the *pragmatic* polysemy case is at its strongest: The specificity and diversity of contexts brings indefinite possibilities of meaning modulation (pragmatic fine-tuning) such that only some small subset of cases (perhaps equivalence classes of cases) seems eligible for conventionalisation. For helpful discussion of Ruhl's account, see Recanati (2017).

However, Ruhl's theoretical commitments (to generative grammar) indicate that he is working with a different notion of semantics from the one at issue here. He mentions "conventions of communication" (p. 126) and "conventionalised senses' (p. 193) only occasionally and in passing, for these are not his interest. His "semantic" focus is *linguistic meaning* and his goal is to make the case for words having a single abstract lexical meaning which underpins all their uses: "[A] word's semantics should concern what it contributes in all contexts" (p. 87). In line with this, I would maintain that we need to make a distinction between those properties of language that are narrowly linguistic/formal and those that are more communicatively and culturally oriented (Carston, 2019). Ruhl's hypothesised monosemous semantics for content words seems to belong in the former category; as he repeatedly says, it is "remote from reality," minimalist and abstract. However, while sense conventions abound and are part of the broader language-as-instrument-of-communication, it remains unclear whether there is such a thing as a narrow linguistic meaning, an abstract common core underpinning and uniting all the senses expressible by a word (see Sections 4 and 5). That there is such an entity is an article of faith among its adherents, as no-one, including Ruhl, seems able to delineate one, although there is no doubting the intuitive appeal of the idea and the prevalence of the feeling that there just *must* be some such thing uniting (and perhaps constraining) the range of senses a word can be used to express.

Somewhat similarly, Frisson and Pickering (2001) favour a "radical monosemy" model, according to which the only element of word meaning/semantics stored in the mental lexicon is an underspecified schematic meaning, which is said to "encompass all related senses of a word" (p. 149), so, for instance: "[T]he initial meaning of *disarmed* is underspecified with respect to whether it refers to removing literal or figurative arms" (p. 158). At a subsequent stage of processing, "context is actively involved in refining the interpretation of a word by changing the underspecified meaning into a specific interpretation" (p. 164), that is, a specific sense is recovered though interaction of the schematic linguistic meaning with contextual information. Again, this sounds very much like a pragmatic account of polysemy, but, again, I find a tension here because Frisson and Pickering are explicitly focusing on established senses of a word: "The underspecified meaning is only applicable for *established* senses. Because the underspecified meaning is an abstraction over the features of specific senses, a *novel* interpretation of a word cannot be captured by the underspecified meaning" (p. 159, their emphases).[13] And, indeed, their experimental materials are all cases of senses that are well-established across adult native speakers of English, (notwithstanding inevitable individual differences). But what are "established" senses of a word if not conventionalised senses, and why would we not store these in our minds in some shape or form (perhaps as an interconnected family or network of senses)? This stance would be what they call the "radical polysemy" view, which they acknowledge is compatible with their experimental findings of an initial processing stage of non-commitment to a specific sense, but which they (tentatively) reject in favour of the "radical monosemy" view, because they believe that contextual information modulates or specifies the schematic general meaning rather than choosing among established senses.[14] As with Ruhl, then, they have a two-component model: A stored abstract linguistic meaning, which is

[13]A clear consequence of this view is that the alleged underspecified meaning does not have any constraining role on the generation of new senses, which seems entirely correct (see Section 4). In fact, the direction of influence is the opposite: New senses that become established/conventionalised would lead to a revision, a further attenuating, of the underspecified meaning.

[14]However, the later work of Brocher et al. (2016, 2018) indicates that there is a selection process, at least in the case of irregular (resemblance-based) polysemy.

semantically underspecified and common to all the related senses of a word, and a pragmatic component where this meaning interacts with contextual information in the recovery of a specific sense. As indicated above, I would advocate a two part lexical store with (i) established (conventionalised) senses for a word stored together as a single family in a pragmatic/communicational lexicon, and (b) a distinct lexical list which interacts with syntax in the narrow grammatical language faculty; if there is a schematic linguistic meaning, this is where it would belong (Carston, 2019). I take it that this is a version of what Frisson and Pickering call the "radical polysemy" view.

Working within the relevance-theoretic framework, Falkum (2015) also takes the position that, by and large, words encode a single meaning/sense and the other senses that a speaker might use a word to express are recovered in context by pragmatic inference. She gives relevance-theoretic analyses of how this inferential process works for several cases of metonymic and metaphorical senses. While she acknowledges that some of these usages may become established, she seems to resist the conclusion that those senses would be stored in the mind and retrieved directly rather than being pragmatically inferred. On her account, the typical outcome of a new sense becoming established within a language community is a "pragmatic routine" or inferential shortcut, which makes that sense more readily accessible (pp. 92–93).[15] However, Falkum's primary aim in the paper is to argue against rule-based accounts of polysemy which locate the phenomenon within the (narrow) linguistic system or "generative lexicon" (e.g., Copestake & Briscoe, 1995; Pustejovsky, 1995) and to establish the pragmatic basis of polysemy. In this respect, her account is, in my view, very convincing. Much polysemy does seem to be pragmatic in its origin: A speaker wishing to communicate a concept for which there is no linguistic encoding chooses that word (or phrase) which seems the best one at her disposal to achieve her goal; that is, its encoded sense should provide the kind of evidence which, together with information from the linguistic and non-linguistic context, will enable the hearer, employing his standing pragmatic capacities and assumptions (including that the speaker will spare him unnecessary processing effort), to infer the new sense. The position I take below is that some polysemy is pragmatic (it never becomes conventional), some is semantic (fully conventional) and many, if not all, of the semantic cases are pragmatic in their origin, derived via relevance-based inference along the lines that Falkum (2015) presents.[16]

Turning now to the opposite extreme: the view that all regularly used senses of a polysemous word or phrase are a matter of semantics. Probably the strongest exponent of the semantic view is Devitt (2013a, 2020, forthcoming), who maintains that for each of two or more regularly occurring senses of a word there is a linguistic convention, that is, a distinct lexically encoded sense. So polysemy is a kind of ambiguity and "[t]ypically, what the speaker does in using a polyseme is not modify a conventional meaning but select one meaning from her lexicon, just as she does in using a homonym" (forthcoming). Devitt's argument against the pragmatic approach consists of three points: (a) It is not sufficient to merely show (by rational reconstruction) that a pragmatic account *could* be given; (b) it must be shown, for any given pragmatic derivation, that it is "psychologically real," that is, it must be located "within the

[15]Falkum (2015) does, in fact, allow that there may be a final step of "lexicalisation" in a few cases: "Frequent activation of these inferential routines may lead to further conventionalisation of senses, and finally, in some cases, to lexicalisation. An example of this may be the mass occurrence of the noun *chicken* in English, whose meat sense seems conventional to the extent that it may have acquired a conceptual address of its own" (p. 92).

[16]Devitt (forthcoming) pits Falkum's pragmatic account against his own semantic account, but the difference seems to be merely one of emphasis and weighting. He concedes that there are some pragmatic cases (but confines them to new ad hoc senses) and she concedes that there are a few cases of a word having "two linguistically encoded senses."

cognitive lives of speakers and hearers"; (c) the psychological evidence required to support the pragmatic position is not available. The conclusion, therefore, is that the semantic account is preferable. I agree with the first point and expand on it shortly in Section 3.2; I will not address the third point except to say that, since adjudicating the semantics/pragmatics question (especially as it is framed by Devitt (forthcoming)) is not something that typically preoccupies the experimentalists, he may well be right about the lack of decisive processing evidence. What I do take issue with is the apparent presupposition of the second point: that the psychological reality burden is somehow greater for the pragmatic account than for the semantic account.

Devitt assumes that the semantic route, that is, the convention-based encoding and decoding of word senses is the basic or default position and so should be assumed unless there is evidence to the contrary. This is simply unwarranted, especially in the case of a sense for which a pragmatic account *can* be given. In such a case, surely, it is an open question whether that sense is conventionalised or not, that is, whether the cognitive process involved is one of retrieving that sense from the lexicon or of pragmatically inferring it from another sense that is conventional/encoded. Elsewhere in his paper, Devitt readily acknowledges that there are novel ad hoc uses of words, probably a lot of them, in fact, and that these have to be accounted for pragmatically. So the situation is as follows: As speakers and hearers, we directly encode/decode some word senses (the fully conventionalised ones) and we pragmatically derive others, using encoded senses as the starting point; therefore, with regard to a word which has at least one encoded sense S-1 but is used to express another pragmatically related sense S-2, there is no antecedent reason to prefer one or other of the semantic or pragmatic accounts. Adoption of either position requires appropriate psychological evidence; there is no asymmetry here in the evidential burden. So, if it is right that existing experimental literature on comprehension and production processes does not provide evidence that can adjudicate between a semantic and a pragmatic account, the question remains unanswered.

Traditionally, theorists have called on principles of parsimony or economy to provide guidance on this kind of question. In the next subsection, I consider whether they can help in adjudicating the issue of whether, when faced with a regular usage of a word to express a second or third sense, we should favour a semantic or a pragmatic account.

3.2 | Which way do parsimony considerations point?

A widely employed "methodological principle" in pragmatics is Grice's "Modified Occam's Razor" (MOR): "*Senses are not to be multiplied beyond necessity*." As applied by many pragmaticists, this has been interpreted as: If the occurrence of a sense or meaning can be explained by an independently motivated mechanism (e.g., Gricean maxims), then it is not *necessary* to posit it as a standing sense or meaning of the word and so it should not be. This principle was a reaction to a tendency among some ordinary language philosophers of the time (1950s and 1960s) to proliferate word senses as their analyses of conversational (as opposed to logical) language uncovered numerous distinct usages of words (see discussion in Grice, 1967/1989: "Prolegomena"). Key cases where MOR has been invoked (by Grice himself and others) are those where a usage is regular, for example, the exclusive interpretation of "or," or a temporal/causal understanding of cases of conjunction (e.g., "She scolded him and he cried"), cases where we either have, in Grice's terms, a "generalised" conversational implicature or a conventionalised sense of the word. Using the independently required conversational maxims, pragmatic explanations were provided for the regular occurrence of exclusive "or" (based on the inclusive sense) and

the temporal/causal conjunction (based on a simple truth-functional sense), indicating that these need not be posited as conventional senses of the word, and so should not be.

However, MOR is a parsimony principle and, as pointed out by Bontly (2005, p. 300), inspired by Sober (1990), parsimony "counts in theory-choice if and only if there are domain-specific reasons to think the theory which is more economical ... is more likely to be true." There do not seem to be any such reasons in the domain at issue, that is, the domain of human knowledge of and use of word senses. On the contrary, given evidence of our capacity to remember vast amounts of general world knowledge and to retrieve thousands of idioms, formulaic phrases and other prefabricated chunks of language (Christiansen & Arnon, 2017; Jackendoff, 1997, pp. 154–160), it seems quite likely that the true theory is the one that maintains that regularly used senses become "stored" and available for direct retrieval. Furthermore, even if we were to favour parsimony considerations in this domain, it could well be less costly overall to store recurrent senses and retrieve them directly, thereby saving on the cognitive processing effort of pragmatically inferring them even though that would be possible.[17]

The general point here is that "calcul*ability*" does not entail "calcul*ation*" (any more than "conventionalisability" entails "conventionalisation").[18] If one regularly occurring sense/use of a word *can* be pragmatically inferred from another regularly occurring sense/use of that word, then it remains to be discovered, on some other grounds, whether it is, in fact, currently inferred by speakers/hearers or has become an established sense stored in their mental lexicon.[19] Devitt (2013b, 2020) points out that MOR, as widely used by pragmaticists, "cannot be right because it would make all metaphors immortal ... Over time, a metaphorical meaning often becomes regularized and conventional: the metaphor 'dies'. Yet a derivation of what is now a new conventional meaning from the old conventional meaning will still be available" (Devitt, 2013b, p. 299). Some care is needed here, as the empirical evidence noted above in Section 2 indicates that metaphorical senses are quite generally judged to be less related to (so less easily derivable from) their literal counterparts than other cases of polysemy (e.g., Klepousniotou et al., 2008). Moreover, truly dead metaphors tend to be treated as distinct words, the inferential connection between the literal and the metaphorical senses having been lost, so as cases of homonymy rather than polysemy (e.g., Devitt's example of the verb "to incense" with the [metaphorical] sense of "to make angry" seems entirely detached from the verb's original sense of "to make fragrant with incense"). However, the general point is surely right: Languages change over time and one of the most flexible and dynamic aspects of this is changes in the senses expressed by (substantive) words, which entails the conventionalisation of at least some derived senses.

Devitt (2013b) talks of adherence to MOR as a methodological flaw of "linguistic pragmatism" (that is, truth-conditional pragmatics) and I must agree. Establishing pragmatic analyses of a range of cases served an important purpose in the early days of Gricean pragmatics, a welcome counter to the "lazy man's" postulation of ambiguity in a word whenever it helped to save

[17]For a nuanced discussion of semantic/pragmatic parsimony trade-offs, see Bontly (2005) and, building on his discussion, Millikan (2017, pp. 178–181).

[18]Essentially the same point was made decades ago by Sadock (1978) in his assessment of Grice's diagnostics for conversational implicatures: "Thus the mere fact that something conveyed by an utterance CAN be worked out according to pragmatic principles is not enough to guarantee that it is in fact a conversational implicature" (p. 286).

[19]Nunberg (1979) takes the radical position that, in general, there are no grounds for making the decision: "[T]he semantics/pragmatics distinction cannot be validated even in principle; there is no way to determine which regularities in use are conventional, and which are not. This is not to say that there are no purely linguistic conventions of use, but rather that the content of these (even construed transparently) is necessarily indeterminate" (p. 143).

a pet thesis from apparent counterexamples (see Kripke, 1977; Ruhl, 1989; Sennet, 2016), but the pendulum has since swung too far in the opposite direction in the hands of over-enthusiastic radical pragmaticists.[20]

In a cute turning of the Occamite tables, Devitt (forthcoming) maintains that parsimony considerations favour semantic conventions (SEM) over a pragmatic approach (PRAG): "We already know that there must be ... convention-exploiting processes of disambiguation in speakers and hearers ... For, those processes are the standard ones for handling homonyms ... SEM is committed to mechanisms we already know to exist ... If we really do lack independent evidence on the subconscious processes that PRAG requires, then we should prefer SEM over PRAG on Occamist grounds." But we already know that there must be pragmatic inferential processes (the sort of processes required by PRAG) because they are employed in the derivation of conversational implicatures and other cases of innovative use. The key point, again, then, is that his semantic account (SEM) is in no better position than a pragmatic account (PRAG) when it comes to Occamite parsimony—the (independently motivated) machinery is there in both cases. The issue is how to weigh up the costs of increased employment of one or the other kind of machinery and that remains unresolved.

Leaving parsimony aside now, perhaps another factor militating against the postulation of a convention when a sense can be pragmatically derived lies with the view that conventions are arbitrary (in the UK we drive on the left, but we might just as easily have adopted the convention of driving on the right; there is no particular reason for preferring one to the other). A component of sense that can be pragmatically inferred does not seem to be arbitrary; calculability and conventionality seem then to be incompatible ("must be incompatible," according to Lepore & Stone, 2015, p. 104). However, when thinking about sense conventions (and perhaps any conventions), we need to distinguish two senses of "arbitrary" (yet another case of polysemy!): (a) that it could have been otherwise; and (b) that it is unmotivated. Sense conventions are arbitrary in the first sense but not necessarily in the second sense. Many established senses of a polysemous word are motivated (they have been derived from the available evidence, guided by rational pragmatic principles), but they could have been otherwise, given a different context, a different speaker and/or hearer, or a different language history (e.g., no Norman conquest of England, hence no words "beef" or "mutton," hence no block on a meat sense for "cow" and "sheep"). Neither parsimony nor arbitrariness (in its first sense) weighs against the postulation of a second or third sense for a word when that sense can be calculated from another sense which is indubitably encoded by the word. That is, neither of these can help in adjudicating whether a sense that is regularly expressed by a word is a matter of the word's semantics (its encoded/conventional content) or is instead a sense that is (still) pragmatically derived.

To conclude this section, the two stances (semantic and pragmatic) are not rival positions at any across-the-board global level: In some instances, the senses/concepts that a speaker can use a word to express are conventionalised (hence comprehension may require disambiguation) and, in some other instances, they are pragmatically constructed (contextually modulated). However, they may be, in a certain sense, rival positions in specific cases, for instance, it might be that "angel" understood as a very kind considerate person or "shout" (as in "this is my shout" when offering to pay for a round of drinks in a pub) are conventional/semantic for some but need to be figured out (pragmatically) by others. This is just a function of the different

[20]Note that Grice himself was rather judicious in his use of the principle. See his discussion of the sense of "loose" in "loose life" and of the two senses of "animal," the general sense that includes humans and the more specific "beast" sense, for which he seems not to favour a pragmatic (conversational implicature) account (Grice, 1978/1989, pp. 48–49).

communicative histories of individuals, all of whom can, nonetheless, be said to speak "the same language" and, for the most part, it does not create a problem in communication, due to the pragmatic capacities of speakers/hearers which can make up for semantic/encoding gaps.[21] So, while I agree with Devitt that many regularities in the use of a word to express a second or third related sense are instances of conventionalised senses (semantic polysemy), there is a bigger story to tell, one that accommodates individual differences and that explains how the various senses of a word relate to each other, a story that is partly pragmatic and partly semantic.

4 | THE PRAGMATIC BASIS OF POLYSEMY

The discussion in this section is developed within the framework of "truth-conditional pragmatics" (or "semantic contextualism" or "linguistic pragmatism," as it is variously known). The general claim of this approach is that the proposition explicitly expressed by a speaker is seldom, if ever, fully captured by its linguistic content and hearers must employ pragmatic inferential processes in order to determine that content.[22]

The occasion-specific adjustment or modulation of an established (encoded) sense of a word is one of the phenomena that require a hearer to use pragmatic inferences in recovering the proposition explicitly communicated (Carston, 2002, 2012; Recanati, 2004, 2010; Wilson & Carston, 2007). Consider the following uses of the word "mother":

3. a. My *mother* was born in 1935.
   b. Stop telling me what to do. You're not my *mother*.
   c. Jack was both my father and my *mother*.
   d. Ma Rainey was the *mother* of the blues.

In (3a), we probably have a literal use, "mother" in the sense of a biological female parent, but each of the others involves a different, albeit related, sense. Exactly what that is in each case, of course, depends on the wider context, but the following rough characterisations are plausible: In (3b), the irritated speaker is not telling her addressee that she is not her biological parent but that she is not someone who has the right to treat her in a particular (directive) way; in (3c), "mother" is used to ascribe to Jack properties to do with nurturing, comforting and supporting; in (3d), it ascribes to Ma Rainey the status of a great pioneering female figure, the first and perhaps the greatest in her field (that of female blues singers). In all three of these, the concept expressed resembles the encoded literal concept MOTHER but is broader than it in some respects (its denotation is not confined to biological mothers) and narrower in other respects: In (3b) it denotes people with (stereotypic) negative attributes of (some) mothers; in (3c) it denotes people with (stereotypic) positive attributes of (some) mothers; in (3d) it denotes some sort of powerful all-embracing female figure (cf., "mother nature," "the mother of all storms"). These are all

[21] As already noted, the experimental studies on polysemy discussed in Section 2 use well-established senses, something they ensure by running norming studies prior to their processing experiments; the result is a set of cases that, I assume, succeed (more or less) in abstracting away from inevitable individual differences.

[22] For detailed arguments in favour of this position, see Sperber and Wilson (1986/1995), Carston (1988, 2002), Recanati (2010), and Hall (2014). The opposition case is put by Borg (2004) and Devitt (2013a, 2013b, 2020), among others.

fairly easily grasped but may be, at least for many people, not fully conventionalised senses of "mother," so pragmatically derived (and if not now, they were once).

Returning to the multiply polysemous words cited at the beginning of this paper, the verb "run" and the noun "line," consider the following, where I am attempting to express a new sense, albeit one that should be inferable from a more established sense/use of the word[23]:

4. a. The seagulls *run* the coastal waters.
   b. Let's remove the pleats—they're bad for the *line*.

Exactly what is intended remains unclear without considerably more context. One possibility for the sense of "run" in (4a) is something like "fly back and forth across a particular area," another is "make an impact on/regulate/affect." Suppose that an utterance of (4b) occurs in a discussion between a dress-maker and her client, so the sense of "line" concerns the way a gown falls or how well it shows the client's figure. These are irregular resemblance-based cases, probably involving some degree of broadening of an existing sense. Cases of new uses of words that require a narrowing of an existing sense may arise on a visit to the hairdresser, when you are asked whether you would like a "treatment" and told that "product" will be applied to your hair. Given the circumscribed context, you will likely be able to figure out (roughly) what is meant: The sense of "treatment" is narrowed down to some sort of (special) hair-washing procedure and "product" to a sticky substance intended to control wayward hair.

According to the relevance-theoretic account of how these ad hoc senses are derived, it involves a single context-sensitive pragmatic inferential process, which can have variable outcomes: A narrowing or a broadening of denotation, or a combination of both (as in many cases of metaphorical use). Here is a sketch of how the process works, using the example (3c), "Jack was both my father and my mother," and assuming that Jack is a man. Let us suppose the word "mother" encodes (i.e., has as a conventionalised sense) the atomic concept MOTHER which provides a direct link to an "encyclopaedic entry" of assumptions/beliefs about mothers, including the following (and much more):

5. a. A mother is a female parent [with further information about biological mothers, adoptive mothers, stepmothers, surrogate mothers, etc.].
   b. A mother typically takes care of her children from their birth until they are old enough to look after themselves.
   c. The love and nurturing of a mother is beneficial/crucial to a child's development.
   d. A mother may control/direct/manipulate her children in ways that are not beneficial and which they may resist.

[23]As Recanati (2017) notes, a complaint about much work demonstrating pragmatic meaning modulation (as in Recanati, 2004; Wilson & Carston, 2007; Falkum, 2015) is that very often the pragmatically derived sense being discussed is already well-established, perhaps even fully conventionalised. There are two reasons for this: (a) the main point of the work has been to demonstrate that such senses have been (and can still be) pragmatically derived, whether or not they are now fully conventionalised, and (b) managing to convey to readers the intended sense of a really new, ad hoc usage requires a lot more detailed setting up of context. Nevertheless, I try here to provide some cases that are at least newish (much helped by discussion with Tim Pritchard).

Some elements of encyclopaedic information are more accessible (more highly activated) than others, depending on the content of the rest of the utterance and the specifics of the occasion of use. For the current example, the most highly activated items of information are likely to be those in (5b) and (5c), which are then used as contextual assumptions/premises in deriving *contextual implications* (e.g., Jack gave the speaker the love and nurturing typical of a mother; this was highly beneficial to her development), which, in turn, via a mechanism of "mutual parallel adjustment" of explicit content, contextual assumptions and contextual implications, modulates the concept expressed/communicated by a word, yielding a distinct ad hoc concept MOTHER*, a concept whose denotation is both broader than the encoded concept MOTHER as it includes men who have given children a certain kind of motherly nurturing and narrower in that it excludes negligent mothers. This inferential process stops when context-specific expectations of relevance (formed on the basis of the presumption of "optimal relevance" conveyed by all utterances) are satisfied. The ad hoc concept/sense that is inferred is a constituent of the explicit (truth-conditional) content of the utterance, taking the place of the decoded concept MOTHER. We have here, then, another instance of truth-conditional pragmatics.[24]

This is but a sketch and raises many questions, two of which I will mention here. First, how generally applicable is it? It seems to work quite well for a noun like "mother" for which we have a rich array of encyclopaedic information to call on and this may be true for nominal concepts fairly generally, but what about verbs and adjectives? It is noticeable that, by and large, when theorists try to set out any sort of pragmatic derivation (and virtually no one but relevance theorists does) they tend to turn to nouns. It is less clear that we have such information-rich encyclopaedic entries for concepts encoded by the verbs "run" or "bear," or by the adjectives "clean," or "tired," all of which can be used to convey multiple senses. Perhaps the key contextual evidence in these cases rests more on information about past usages and their relation to the specifics of the current context than on general encyclopaedic assumptions. Work is needed on this. Second, do all pragmatic modulations of a concept/sense encoded by a word themselves constitute a distinct concept/sense? This is a question about how we should individuate concepts/senses. Some, perhaps many, modulations constitute tiny adjustments to a specific context and are perhaps too fine-grained to have the potential to be distinct senses of a word (see fn. 12). Again, work is needed. (For discussion of some of the problems of sense individuation, see Cruse, 2000, Geeraerts, 2016).

Given the diversity and indefinite range of contexts and of the thoughts we would like to express within them, word sense adjustments/modulations of this sort are going on all the time in linguistic communication. Some are one-off uses, pragmatically inferred on the specific occasion but transient; some create a precedent and recur, and the word may become frequently used with that sense so that the pragmatic inference becomes streamlined/routinised; some become fully conventionalised/encoded and are stored as senses of the word in a lexicon from which they can be directly retrieved (semantic polysemy). A plausible example of each is given here:

6. a. We're going to need *semtex* to extract that tooth!
   b. My aunty Joan was a second *mother* to me.
   c. I can't *drink* because I'm driving.

[24]For more detailed relevance-theoretic accounts of ad hoc concept derivation, see Wilson and Sperber (2004), Wilson and Carston (2007), and Falkum (2015, 2017).

The (attested) use of "semtex" in (6a) (a pragmatic broadening) is probably a one-off; the use of "mother" in (6b) (a broadening and a narrowing) is not unprecedented, perhaps moderately frequent; the use of "drink" in the narrowed sense of "drink alcohol" in (6c) seems to be fully conventionalised, such that "drink" (as both verb and noun) is semantically polysemous. In Recanati's (2017) apt slogan: (Semantic) polysemy is conventionalised modulation.

The general point of this section has been to demonstrate that new senses (ad hoc concepts) for a word arise through standard relevance-based pragmatic inference and, thus, that *many* instances of semantic polysemy have their origin in online pragmatic processes of conceptual adjustment in context (a point that is not original to relevance theory, although the specific account of it is). I say "many" rather than "all" because there are two other sources of polysemy. One is explicitly stipulated definitions for specific purposes, as in scientific, medical or legal domains (e.g., the legal stipulation that the word "child" in England denotes anyone who has not yet reached their 18th birthday). The other, which is of greater interest here, is syntax. For instance, a noun may occur with count or mass phrasal syntax, giving rise to distinct senses (e.g., "I can see two rabbits," "I don't like rabbit"), each of which may, in turn, be pragmatically adjusted to provide further senses (e.g., narrowings of the general mass sense to the meat and the fur senses) (see Borer, 2005a; Falkum, 2017), and a verb may enter into several distinct argument structures (or syntactic frames) and be understood differently as a result; for example, the piling up in "Mary piled up the stones" is understood to be an intentional action, but in "The stones piled up in the hurricane" it is not (Borer, 2005b; Marantz, 2013).

Syntax and pragmatics work together in a second kind of prevalent online lexical creativity, that of cross-categorial modulations of meaning/sense (i.e., motivated coinings of new words). I am focusing here on cases where the new word does not involve any change of form (no category-distinguishing affixes as in "problem-atize" or "typ-ist"), known in some frameworks as "conversion" (Lieber, 2004).

7. a. The factory horns *sirened* midday.
   b. Max *houdinied* his way out of the prison cell.
   c. Joan used to *jam-spoon* her son regularly.
   d. I need a quick *fix* for my broken watch strap.
   e. Hiring Joe was a really good *get*.
   f. Marie was an *embed* for two years in Afghanistan

   (examples (7a) to (7c) adapted from Clark & Clark, 1979)

We can think of these as "ad hoc words," that is, new on-the-spot coinages: $[\text{siren}]_{\text{v}}$, $[\text{houdini}]_{\text{v}}$, $[\text{jam-spoon}]_{\text{v}}$, $[\text{fix}]_{\text{n}}$, $[\text{get}]_{\text{n}}$, $[\text{embed}]_{\text{n}}$, with each of which comes an ad hoc concept/sense, distinct from any sense of the word from which it was derived. Focusing now on the noun-to-verb conversions, which are more common than verb-to-noun (a point worth further thought), it seems clear that grasping the intended sense is a matter of pragmatic inference using information provided by the encyclopaedic entries linked to the noun senses (e.g., knowledge about the sound and purposes of sirens; knowledge about the man Harry Houdini), plus immediate context (especially necessary in the "jam-spoon" case), all crucially constrained by the syntax of the new word and its wider syntactic environment. There is a case, then, for talking of families of senses whose relatedness crosses syntactic categories, so that the formal polysemy-bearing unit

is more basic than the word (noun, verb, adjective); it is the (categoryless) root they share: √stone, √houdini, √fix, √laser, and so forth.

As discussed above for the new senses of existing words, some of these will be one-off uses (e.g., "jam-spoon" used here to denote the action of hitting someone with a large wooden spoon used in making jam), some will become established words in the language (perhaps the verb "siren" is now one of these) and others will be somewhere in between (the verb "houdini" may be on its way to becoming established, perhaps at the "pragmatic routine" stage, in the terms of Falkum, 2015). Each verb is potentially polysemous in its own right; for instance, the verb "houdini" has distinct (albeit related) senses in the following cases; in (8b), it denotes frantic twisting movements of the body; in (8c), it denotes ingenious ways of releasing something (here money) from an apparently secure location:

8. a. Max houdinied his way out of the prison cell.
   b. The toddler wailed and houdinied in his push-chair.
   c. The manager houdinied the company funds into his own bank account.

In the next section, I outline what seem to me to be some key issues to be addressed in a more complete account of (irregular) polysemy and the direction to take in pursuing them.

5 | WHERE TO NEXT? CONCEPTUAL FLEXIBILITY AND SYNTACTIC CONSTRAINTS

A focus on the fundamentally pragmatic nature of (irregular) polysemy brings with it an emphasis on the considerable flexibility of our capacity to generate and grasp new senses for words in new contexts. The senses of a polysemy family are related by chains of pragmatic inference each of which is constrained only by those components of encyclopaedic information linked to the input sense/concept that are most accessible and relevant in the particular context of generation. This may seem excessively under-constraining, prompting the worry that I am overstating the free and creative nature of our expression of new senses for words (ad hoc concepts). As discussed in Section 2, a first thought here is that there is surely a component of meaning shared by all of the senses comprising a word's "polysemy complex," a stable core meaning (or set of "semantic features," as the psychologists put it). I can see no evidence for such an entity, but even if there is, it does not function as a constraint on the pragmatic process of generating new senses expressible by the word. A particular *pair* of senses may overlap, as in Brocher et al.'s (2016) discussion (see Section 2) and as the pragmatic account of ad hoc concept derivation demonstrates, but as more senses accumulate they move off in different directions such that they form a family or network of nodes that are interrelated but are not restricted to a common template.[25]

However, as noted in the previous section, when the expression of a new sense involves a word category change, there is a very general "meaning" constraint on that sense, which comes

[25]As Wittgenstein (1953) observed when discussing the word "game," the senses of a polysemous word form "a complicated network of similarities overlapping and crisscrossing" (p. 31). See also Langacker's (1991) discussion of the network of senses for "run" (p. 267), and Ramiro, Srinivasan, Malt, and Xu's (2018) account of the different senses of "face" in terms of their model of "nearest neighbour chaining," which bears interesting similarities to the relevance-theoretic account in Section 4.

from the syntactic category of the new word. The category—noun, verb, adjective—ensures that the new sense denotes, very roughly, "things" or "eventualities" (actions, states) or "properties," respectively. And, given the rule-governed nature of the syntax, which provides a logical form for the proposition expressed by an utterance, we might expect it to be a source of further constraints on the senses expressible by a given word. With this in mind, I turn to a brief discussion of some current work in generative grammar.

Many linguists have pointed out a striking difference between two kinds of "semantics," the two variously labelled as "semantic structure" and "semantic content," or "grammatical meaning" and "conceptual content," or "semantic skeleton" and "encyclopaedic body," and all note the rigidity of the first member of the pair and the flexibility of the second (e.g., Borer, 2005a, 2005b; Grimshaw, 2005; Lieber, 2004; Ramchand, 2008). Obviously, my focus in this paper has been on the second, the flexible, side of the distinction and the important question now is the extent to which the first, the rigid, side imposes constraints on the new senses a word can be used to express. A relevant and productive, if ultimately inconclusive, line of inquiry is that of Levin (1993) and Levin and Rappaport-Hovav (1995), who have investigated the nature of verbs and the various argument structures they can enter into. They have characterised verbs as falling into classes, for instance, the class of "change of state" verbs (e.g., "break," "open," "bake," which change the state of their object from intact, closed, raw, to broken, open, baked, respectively), and the class of "manner" verbs (e.g., "shout," "cry," "march," "stroll"), each class associated with a particular argument structure profile (e.g., "Sue opened the door"; "The door opened"). To the extent that this is correct, these components of grammatical meaning (change of state, manner of doing something) may impose a constraint on new senses, so that, for instance, a metaphorical sense of "open" (as in "open your mind") has to involve a change of state. Note that this is very different from the "core meaning" position discussed above, inasmuch as that view postulates an underspecified meaning that is unique to the specific word, a meaning that unifies and individuates it, while the Levin account characterises *classes* of words.

Recently, persistent problems with this verb level classification have led to a decomposition of verbs and other word categories into roots and their categorising heads (e.g., √open + v, √open + adj; √siren + n, √siren + v), with the view that it is categoryless roots (not words) that are the atomic terminal elements of syntactic structures (Acquaviva, 2009; Borer, 2005b, 2017; Harley, 2013; Marantz, 1997, 2013, among others). This opens up the prospect of capturing the cross-categorial nature of much polysemy, with a range of possibilities for how it may play out depending on whether roots themselves are shown to have meaning properties or not, a very interesting but contentious issue which I cannot pursue here (Arad, 2003; Borer, 2017; Panagiotidis, 2014).

Furthermore, it points to the need for care in discussions of polysemy about what content is attributed to a word/root and what is attributed to the wider syntactic frame within which the word/root appears. A useful illustration of this is provided by the (now much discussed) case of different occurrences of the verb "siren," originally presented by Clark and Clark (1979, p. 803):

9. a. The fire stations sirened throughout the raid.
   b. The factory sirened midday and everyone stopped for lunch.
   c. The police sirened the Porsche to a stop.
   d. The police car sirened up to the accident.
   e. The police car sirened the daylights out of me.

This looks like a case of polysemy, with the verb "siren" expressing a different (albeit related) sense in each case, roughly:

10. a. Produce a wailing sound by means of a siren.
    b. Use a siren to signal a time.
    c. Use a siren to issue an order or warning.
    d. Drive quickly while sounding a siren.
    e. Scare by means of the sound produced by a siren.

Clark and Clark acknowledge that "the interpretation of the innovative verb is strongly constrained by its syntactic environment" but go on to emphasise the importance of pragmatics, specifically the role of world knowledge: "to distinguish the interpretation of 'siren midday' and 'siren the Porsche to a stop', one must know the difference between factory and police sirens, and how they are used" (p. 803).

The syntactician Borer (2005b, pp. 69–70) discusses these cases from her "constructivist" perspective on the syntax–lexicon relation, according to which syntactic constructions or templates have a meaning which comprises an event structure with a range of properties (temporal and aspectual) and relations (among the participants in the event and subevents). As she points out, each of the five examples in (9) has a distinct argument structure, determining a distinct syntactic construction, each with its own meaning, which consists of a particular event type, for example, an event of signaling in (9b), an event with a specific end goal in (9c), an event of locomotion in (9d). On this way of looking at the situation, "the particular event in which *siren* is embedded will be determined by the syntax it finds itself in, and not by *siren* itself ... the verb *siren* [is] interpreted as a modifier of that event" (p. 70). It is impossible to do justice to Borer's big picture here, but this brief discussion should be enough to indicate the general issue: Whether or not we adopt her particular view of the syntax-lexicon relation, there is an important question regarding which components of the apparent polysemy come from the syntax and which are attributable to the word or root.

Suppose we were to accept Borer's account on which the syntax plays a substantial role in determining, for instance, whether the sirening is an event of marking a time as in (9b), is used to bring about a result as in (9c), or involves a psychological predicate as in (9e), then we may conclude that the verb "siren" itself means nothing more than "emit sound by use of a siren," so it is not polysemous. This would be too swift, however, since it is, like all substantive words, pragmatically susceptible to being used to express a range of further senses, as the following examples indicate:

11. a. The police sirened me to a stop with a loud whistle.
    b. He sirened his point that the Russians were coming.
    c. The kids shrieked and sirened loudly all afternoon.

The first two, taken from Ruhl's (1989, p. 84) discussion of the Clark and Clark paper, are cases of what he calls "pragmatic generalisation," where the sense of the verb "siren" is broadened: In (11a), it has the ad hoc sense of producing a warning by using any instrument that emits an appropriate sound, and in (11b), its sense involves a kind of emphatic insistent warning.

Another possibility is the "metaphorical" use in (11c) where the children used their voices to make shrill "ee-aa, ee-aa" sounds.

The general point here is that the local pragmatic processes that modulate the conceptual content (senses) of words and phrases are operating within syntactic configurations that impose a particular structure of participants and relations. So when we are faced with an apparent polysemy, there is always an issue of teasing out which aspects of the overall sense are to be attributed to the rigidly constraining syntax and which to the flexible concept-modulating pragmatics (and, ultimately, to the conventionalised senses).

6 | CONCLUSION

The myriad complex phenomena discussed under the term "polysemy" raise a host of questions concerning the nature of word senses, their relation to occasion-specific pragmatically inferred conceptual modulations, their relations with one another (metonymies of several kinds, metaphorical, narrowing/broadening), and their interaction with syntactic meaning constraints. It may be that some cases (in particular, some of the regular metonymic cases) are simply different aspects of an inherently complex concept (e.g., SCHOOL, BOOK, LONDON) and may, ultimately, be shown not to involve multiple discrete senses of a word (so, strictly speaking, not to be instances of polysemy, after all). It may be that the degrees of relatedness among irregular senses of a word are so variable (in particular, between literal and some metaphorical senses) that the distinction between polysemy and homonymy turns out to be not worth preserving. This is an area in which just about everything is up for grabs and the most I can hope to have achieved here is to have set out some of the distinctions in play and some of the many intriguing issues that need to be addressed.

ACKNOWLEDGEMENTS

Some of the material in this paper was presented at a *Mind & Language* workshop on Polysemy, organised by Gregory Currie and held at the University of York, in October 2019. I would like to thank the participants at that workshop for their lively discussion and helpful suggestions, in particular, the other speakers: Michael Devitt, Francois Recanati, and Deirdre Wilson. I am especially grateful to Ingrid Lossius Falkum, Tim Pritchard, Deirdre Wilson, and an anonymous reviewer, who read earlier drafts of the paper and gave me constructive criticism and encouragement.

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How to cite this article: Carston R. Polysemy: Pragmatics and sense conventions. *Mind & Language*. 2020;1–26. https://doi.org/10.1111/mila.12329