

Corpus Analysis and Lexical Pragmatics: An Overview

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Abstract

Lexical pragmatics studies the processes by which lexically encoded meanings are modified in use; well-studied examples include lexical narrowing, approximation and metaphorical extension. Relevance theorists have been trying to develop a unitary account on which narrowing, approximation and metaphorical extension are all explained in the same way. While there have been several corpus-based studies of metaphor and a few of hyperbole or approximation, there has been no attempt so far to test the unitary account using corpus data. This paper reports the results of a corpus-based investigation of lexical-pragmatic processes, and discusses the theoretical issues and challenges it raises.

Keywords: lexical narrowing, broadening, approximation, metaphor, word meaning

1. Introduction

In his book *Words and Phrases: Corpus Studies of Lexical Semantics*, Michael Stubbs (2001: 71) comments on the importance of using corpus data as a complement to introspective evidence in the study of word meaning:

In many areas of semantics and pragmatics, intuitions are strong and stable (...) and must be given the status of data. However, there are also many cases in the literature where the intuitions of native speakers are less than certain, or where intuitions are demonstrably unreliable, or just missing altogether (...).

We share the view that corpus-based evidence provides a valuable complement to more traditional methods of investigation, by helping to sharpen intuitions, develop and test hypotheses and reduce the possibility of intuitive data being mere artefacts of the linguist. In this paper, we present the results of a corpus-based study used to develop and test hypotheses in the rapidly-developing field of lexical pragmatics.¹

Lexical pragmatics explores the application of the semantics-pragmatics distinction at the level of the word or phrase rather than the whole utterance. A central goal is to investigate the processes by which linguistically-specified (encoded) word meanings are modified in use (Lakoff, 1987; Carston, 1997, 2002; Blutner, 1998, 2004; Lascarides and Copestake, 1998; Sperber and Wilson, 1998, 2008; Glucksberg, 2001, 2003; Fauconnier and Turner, 2002; Wilson and Sperber, 2002, 2012; Horn, 2004, 2012; Recanati, 2004, 2010; Wilson and Carston, 2007). Well-studied examples of such processes include lexical narrowing (e.g. *drink* used to mean ‘drink alcohol’, or ‘drink substantial amounts of alcohol’), approximation (e.g. *square* used to mean ‘squarish’) and metaphorical extension (e.g. *battleaxe* used to mean ‘frightening person’). A striking feature of much

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existing research on lexical pragmatics is that narrowing, approximation and metaphorical extension tend to be seen as distinct processes which lack a common explanation. Thus, narrowing is often treated as a case of I-implicature (governed by an Informativeness-heuristic, “What is expressed simply is stereotypically exemplified”) and analysed as a variety of default inference (Levinson, 2000; see also Blutner, 1998, 2004). Approximation is often treated as a case of pragmatic vagueness involving different contextually-determined standards of precision (Lewis, 1979; Lasersohn, 1999). Metaphor is widely seen as involving blatant violation of a pragmatic maxim of truthfulness, with resulting implicature (Grice, 1967; Levinson, 1983). Typically, such accounts do not generalise: metaphors are not analysable as rough approximations, narrowings are not analysable as blatant violations of a maxim of truthfulness, and so on. Relevance theorists have been trying to develop a more unified account based on two main claims: first, there is no presumption of literalness – linguistically specified word meanings are typically adjusted (e.g. broadened or narrowed) in the course of pragmatic interpretation, using information accessible in the discourse context; second, there is a continuum of cases of broadening, from approximation through to “figurative” uses such as hyperbole and metaphor, which all involve the same interpretive mechanisms and can be explained in the same way (Wilson and Sperber, 2002; Wilson and Carston, 2006, 2007, 2008; Vega Moreno, 2007; Sperber and Wilson, 2008). How might the use of corpus data provide evidence for or against these theoretical claims? Here we report some results we obtained by the use of corpus-based evidence in a theoretical project on lexical pragmatics, and outline some of the challenges we encountered.

The use of corpus data in a project of this type presents several challenges. In the first place, as Sinclair (1991) points out, with grammatical words such as *the* or *not* occurring in a sizeable corpus hundreds of thousands of times and lexical words just a few dozen, statistical generalisations about lexical meaning are relatively hard to obtain. For instance, in the Bank of English (the 56 million word corpus we used in our research), among the words or phrases whose uses we wanted to analyse, *red eyes* occurs a mere 29 times, *bulldozer* only 61 times, *painless* 89 times, *boiling* 332 times, and so on. At one point, we were interested in the metaphorical use of *bulldozer* to mean ‘forceful, bullying person’, which is often described in the linguistic and philosophical literature as a standardised metaphor, and were surprised to find that it only occurred once, in a reference to Jacques Chirac being nicknamed “the bulldozer”. Still, our data did reveal some clear statistical tendencies, and were also useful in helping us address a common objection to relevance theory, that it tends to rely on made-up examples rather than attested utterances.

In the second place, although corpus analysis is an invaluable tool for lexicographers, its applications to theoretical work in lexical pragmatics have been rather limited. For instance, there have been relatively few corpus-based studies of approximation or hyperbole,² and while there are many corpus-based studies of metaphor, most start from the assumption that metaphorical extension works differently from other lexical-pragmatic processes, and aim to develop criteria for distinguishing metaphorical uses from other types of literal or figurative uses (Deignan and Potter, 2004; Deignan, 2005; Pragglejaz Group, 2007; Steen, 2007; Steen et al., 2010a,b; Hanks, 2010). Since our starting point was the hypothesis that it is neither necessary nor possible to distinguish such categories as “metaphor”, “hyperbole”, “approximation” and so on in constructing an adequate pragmatic theory, we could not simply adopt the methods used in such studies, but had to develop new strategies for uncovering theoretically relevant data.

Finally, corpus linguists tend to focus on established patterns, on conventional rather than novel uses of language. According to Stubbs, corpus semantics should be concerned with normal cases: with what does typically occur, rather than what might occur in strange circumstances (ibid.: 61). Deignan (2005: 5) approaches metaphor on similar lines:

² On hyperbole, see Cano Mora (2008), Sert (2008) and Claridge (2011); on vagueness/approximation, see Drave (2002).

Like many corpus linguists, my concern is with typical language patterns rather than the innovative or literary. In the case of metaphor studies, this implies conventionalised metaphors, those that might go unnoticed in everyday life.

Pragmatic theorists by contrast, are concerned with the mental processes that enable hearers to infer the speaker's meaning in both novel cases and standardised or conventionalised ones,³ and we had to develop search strategies for uncovering both types of case.

In fact, corpus studies proved a valuable source of inspiration in our research, forcing us to consider examples that we might not have come up with ourselves, helping to sharpen and test our hypotheses, and raising new and intriguing questions. In this overview, we will illustrate how we used corpus-based evidence to shed light on three main theoretical hypotheses:

- (a) The first hypothesis was that lexical narrowing is a highly flexible, creative and context-sensitive process, which cannot be easily handled in terms of default inference.
- (b) The second was that there is no sharp theoretical distinction between literal, loose and metaphorical uses, but a continuum of cases with no clear cut-off point between them, which all involve the same interpretive mechanisms and are understood in the same way.
- (c) The third was that the study of lexical pragmatic processes should shed interesting light on traditional semantic notions (e.g. literal meaning, polysemy, semantic change)

Here we will give a brief overview of the type of results we obtained, outlining the theoretical motivations behind some of our searches and the main conclusions we draw.⁴

2. Lexical narrowing

Lexical narrowing involves the use of a word or phrase to convey a more specific concept (with a narrower denotation) than the linguistically encoded "literal" meaning. To illustrate, consider (1) and (2):

- (1) Mary is a *working mother*.
- (2) Bill *has money*.

In many circumstances, the speaker of (1) would be taken to mean not just that Mary falls into the category of people who are both mothers and work, but that she is a prototypical working mother, who has young children living with her, and who works for money outside the home. Similarly, the speaker of (2) would be understood as conveying not just that Bill falls into the category of people who have some amount of money, however small, but that he has a significant amount of money, enough to be worth remarking on in the circumstances.

One theoretical view which fits well with the focus of corpus linguistics on conventionalised language patterns is that lexical narrowing is analysable as a variety of default inference. For instance, Levinson (2000: 37-8, 112-34) treats narrowing as involving a default inference governed by an Informativeness heuristic ("What is expressed simply is stereotypically exemplified"), itself backed by a more general I-principle instructing the hearer to

³ For evidence that novel or "nonce" uses may be understood as fast as conventional ones, see Clark and Clark (1979), Clark and Gerrig (1983).

⁴ For further analyses and data, see the Corpus Analysis section of the AHRC Lexical Pragmatics website: <http://www.ucl.ac.uk/psychlangsci/research/linguistics/lexicalpragmatics/Corpus>

Amplify the informational content of the speaker's utterance, by finding the most *specific* interpretation, up to what you judge to be the speaker's m-intended point (...). [ibid: 114]

The I-heuristic might be seen as dealing with stereotypical lexical narrowings such as (1) above, and the I-Principle as dealing with less stereotypical cases such as (2), where what counts as “having money” varies from situation to situation.⁵ On this approach, hearers are seen as automatically constructing a stereotypical (or otherwise enriched) interpretation and accepting it in the absence of contextual counter-indications. The alternative view, which we favour, is that lexical narrowing is a far more creative and flexible process, involving the construction of ad hoc, occasion-specific concepts influenced by a much wider range of cognitive and contextual factors than default approaches take into account (see e.g. Sperber and Wilson, 1998, 2008; Carston, 2002; Wilson and Sperber, 2002; Wilson and Carston, 2007). Thus, in order to satisfy the expectations of relevance raised by (1) or (2), the concept of a working mother, or of having money, might be narrowed to different degrees, and in different directions, in different contexts, yielding a range of occasion-specific (“ad hoc”) concepts, e.g. WORKING MOTHER*, WORKING MOTHER**, MONEY*, MONEY**, MONEY***, and so on.⁶

As a starting point for examining these hypotheses, we took a standard problem in lexical pragmatics that does not seem obviously to favour either approach: the fact that the adjective *red* is typically narrowed in different directions in common adjective-noun combinations such as *red eyes*, *red apple*, *red hair*, *red stamp*, etc. (picking out a different shade, distributed in different ways across the surface of the object, in different combinations). A default-based approach might handle this by assigning *red* a different default interpretation for each common adjective-noun combination, and predict that this will be automatically preferred in the absence of contextual counter-indications. Our hypothesis was that, although there is probably a range of fairly standard narrowings of *red* in the context of *eyes*, *hair*, *apple*, *stamp*, etc., the interpretations revealed by our corpus data would still be diverse and creative enough to raise questions about the default approach. We will illustrate using the common adjective-noun combination *red eyes*.⁷

In fact, we found considerable evidence of the creativity and flexibility of narrowing even in this common combination. In each case, the adjective *red* was plausibly understood as communicating a slightly narrower concept (e.g. RED*, RED**) appropriate to the wider discourse context, picking out a particular shade other than focal red, differently distributed over the surface of the eyes. Here are some illustrations:

(3) (...) *red eyes* denote strain and fatigue.

Here *red* is naturally interpreted as picking out a reddish-pink shade ranging around the edges of the eye, on the bags under the eye and perhaps on part of the cornea too. The exact shade and distribution the speaker is taken to convey would vary depending on further contextual clues about the colour of the skin and the degree of strain or fatigue involved.

⁵ Notice, though, that the I-Principle does not explain how the hearer identifies the speaker's intended meaning, but presupposes that he has some independent means of judging what this is. To put it slightly unkindly, the I-Principle says “Choose a more specific interpretation if you think this is what the speaker intended.” But the goal of a pragmatic theory is to explain how hearers decide that a certain meaning *was* intended, and given that lexical broadening is just as common as lexical narrowing, the I-Principle does not get us any closer to this goal.

⁶ We will follow the usual practice in lexical pragmatics of representing linguistically specified meanings (“lexical concepts”) in small capitals (MONEY) and occasion-specific meanings (“ad hoc concepts”) in small capitals followed by one or more asterisks (MONEY*, MONEY**...).

⁷ By expanding the search to include not only “red+eyes” but also “eyes+red” and “red+a number of intervening items+eyes” etc. we managed to increase the number of occurrences to 55.

(4) *In a photography session*: [This flashing light is] to stop you getting *red eyes*.

Here *red* is naturally interpreted as picking out a luminous, rusty red on the iris only.

(5) *In a conversation about demons*: (...) two burning *red eyes* she recalled (...).

Here *red* picks out a fiery and luminous red, distributed over both the cornea and the iris or the iris alone.

There are also metaphorical uses, as in (6):

(6) (...) eyes *red* with resentment (...).

Out of a total of 54 occurrences of *red eyes* and its variants (e.g. “eyes+red” and “red+intervening items+red”) in the corpus, our search identified 26 different such “discourse contexts”. The results are summarised below, along with an indication of the frequency of occurrence of the combination *red eyes* in each such context:

Context	Lines	Number of occurrences
Context of crying	4, 6, 18, 35, 38, 41, 42, 43, 44, 50, 57, 58, 59, 64	14
Context of hardship and/or stress and/or fatigue	21, 40, 45, 53, 55, 60	6
Context of eyes gleaming in the dark	29, 30, 31	3
Context of flu/cold	51, 65	2
Context of a gorilla mask	1	1
Context of eye damage	2	1
Context of midgets	3	1
Context of dizziness	7	1
Context of sheep-like eyes	8	1
Context of Albinos	17	1
Context of red-eye effect	19, 20	2
Context of rage*	23, 54, 68	3
Context of resentment*	39	1
Context of demons	26	1
Context of drunkenness	27	1
Context of Caymans	28	1
Context of koels /cuckoos	34	1
Context of eczema	36	1
Context of heat and sand	54	1
Context of sore eyes	70	1
Context of colour of one's eyes	11	1
Inconclusive cases: (context of fiction)		
Terrestrials with long ears	10	1
Fictional insects	22	1
Unknown entity	24, 25, 47	3
“Giants” and “heroes”	32, 33	2
Unknown context	69, 9	2

Notice that 17 of the 26 discourse contexts occur only once. The significant proportion of one-off uses suggests a level of creativity that poses problems for the default account and argues for a more flexible, context-dependent approach.

These results provide some evidence for the view that a hearer interpreting the phrase *red eyes* on different occasions draws on a wide range of contextual information in constructing an overall interpretation. Relevant contextual factors include the type of entity the eyes belong to (e.g. humans, animals, insects, demons or “a terrifying [gorilla] mask with little red eyes that blinked”), the cause of redness (e.g. eczema, drunkenness, crying, flu/cold, fatigue, exposure to heat, sand, light, etc.), and the severity of the cause (affecting the degree and distribution of redness). The degree and direction of narrowing seem to vary considerably from one discourse context to another, and it is not obvious that any unique default analysis would provide a better starting point for constructing the full range of interpretations than the linguistically encoded “literal” meaning (which simply specifies that the eyes in question must be red in some respects). This case contrasts markedly with those standardly discussed in the literature on narrowing – for instance, Levinson’s *secretary* narrowed to ‘female secretary’ (Levinson, 2000: 117) or Blutner’s *red apple* narrowed to ‘apple with red skin’ (Blutner, 1998) – where a single “normal” or “stereotypical” interpretation seems to hold across most or all discourse contexts.

The results also raise a number of questions for default-based approaches. For instance, should the same default interpretation be seen as assigned in every case (e.g. to every occurrence of *red eyes* in our table above, regardless of the discourse context), or could there be several “default” interpretations, each appropriate to a different discourse context? To account for the flexibility in interpretation revealed by our search, there would either have to be a very large number of “default” interpretations (raising the question of how hearers choose among them), or else the default interpretation would have to be seen as overridden by contextual factors in a very wide range of cases. A simpler alternative might be to assume (as on the relevance-theoretic account we favour) that narrowing is directly affected by encyclopaedic knowledge and pragmatic principles, without passing through an initial “default interpretation” stage.

A further question for default-based approaches is about how they handle cases in which the interpretation remains vague or open. In the absence of adequate contextual clues, for instance, a hearer may narrow the interpretation only to some extent (e.g. ‘red in a way that would be appropriate to the eyes of an imaginary insect’) or leave the interpretation open and not make the effort to narrow at all. According to relevance theory, narrowing should not apply automatically to every occurrence of *red eyes*, but is triggered by pragmatic factors (in particular, the goal of finding an interpretation that satisfies expectations of relevance). This account predicts that hearers will only narrow to a point where the utterance becomes relevant enough (i.e. to a point where it yields enough implications, for a low enough processing cost, to satisfy the particular expectations of relevance raised in that discourse context). In the absence of such triggering factors, it is predicted that narrowing will not take place, and the resulting interpretation may be relatively vague.

In our search, we encountered 9 inconclusive cases in which the entities described as having “red eyes” were either not specified in the immediate linguistic context⁸ or were invented or non-existent living kinds (“fictional insects”, “terrestrials with long ears”, etc). Why assume that hearers construct a concrete mental representation of the shade and distribution of redness over the eyes of a “terrestrial with long ears” at all? It is a genuine problem for default-based approaches to explain what happens to the automatic assignment of a default interpretation in such cases. (For discussion of cases where broadening and narrowing interact, see section 5.)

The notion of a default inference has been developed in many different ways (see e.g. Levinson, 2000: chapter 1.5; Geurts, 2009; Jaszczolt, 2014). Here we will consider how Levinson’s default-based account, which has had

⁸ We restricted the discourse context to a default of 6 lines before and after the search term. If the default context did not provide enough clues, we expanded the search to a further 10 lines before and after the search term and, if the context was still insufficient, we marked the case as open/ inconclusive.

considerable influence in pragmatics, might deal with the corpus data above. According to Levinson (2000), default narrowings are generalised conversational implicatures, to be dealt with in a theory of utterance-type meaning designed to explain how sentences are systematically paired with preferred interpretations irrespective of the contexts in which they occur. For Levinson, a theory of utterance-type meaning contrasts with a theory of utterance-token meaning, or speaker's meaning, such as relevance theory, which is designed to take context and speaker's intentions into account. It should follow that on Levinson's approach, information about the wider discourse context cannot be taken into account in the course of lexical narrowing, and the same default interpretation (specifying a certain shade and degree of redness, distributed over certain parts of the eye) must be automatically assigned to every occurrence of *red eyes*, regardless of any available contextual information about the speaker, audience, preceding discourse, topic of conversation, observable physical environment, and so on.

On the assumption (which we share with Levinson) that communicative systems tend to favour least-effort principles and to evolve in the direction of increasing efficiency, the value of a default-based approach would therefore depend heavily on the distributional frequencies of interpretations on which the default interpretation proves to be acceptable and those in which it has to be overridden or cancelled for contextual reasons. By our fairly generous estimate, a default approach of the type Levinson proposes would guide the hearer in the right direction – and therefore help with processing costs – in roughly 50% of the cases in our table above (i.e. those involving crying, fatigue, flu/cold, eye damage, eczema, heat/sand and sore eyes, although each result would have to be contextually fine-tuned in the light of more detailed contextual information about the speaker, addressee, person described, cause of the condition, etc.), but would be positively misleading and incur the costs of cancellation in the remaining 50% of cases. A more flexible inferential approach such as relevance theory would involve context-sensitive – and therefore relatively costly – fine tuning of the encoded lexical meaning in the full range of cases, but without the costs of default derivation followed by cancellation and reinterpretation in 50% of the cases. It is far from obvious that the statistical tendencies revealed by our corpus justify a default rather than an inferential account of lexical narrowing on grounds of economy of processing, yet this was the main rationale for the default approach proposed in Levinson (2000: chapter 1.3).⁹

A further claimed advantage of default-based approaches to narrowing is that they explain the ready accessibility of “normal”, or “stereotypical”, narrowings in the absence of special contextual factors. However, there are other ways of explaining this ready accessibility without appeal to defaults, as in Horn's approach based on his R principle (“Say no more than you must”, Horn, 2004: 13) or relevance theory's approach based on the Presumption of Optimal Relevance, which predicts that “normal” or “stereotypical” interpretations will be less costly to construct in most circumstances, and will therefore be selected by the relevance-guided comprehension heuristic¹⁰ as long as they yield enough implications to satisfy the audience's expectations of relevance. Moreover, neo-Griceans such as Levinson, Horn and Blutner have been primarily concerned with Grice's category of generalised conversational implicatures – those that go through in the absence of special contextual features – and have said little or nothing about how they would treat loose, hyperbolic or metaphorical uses of language, which are heavily context dependent and in Grice's framework violate his first Quality maxim (“Do not say what you believe to be false”). Relevance theorists have consistently argued against this maxim and defended the view that there is a continuum between literal, loose and metaphorical uses rather than a set of clearly definable theoretical categories which play distinct roles in communication and comprehension (Wilson and Sperber, 2002). In the next section, we will consider what light the corpus data can shed on this debate.

⁹ For further discussion and experimental comparison of the relative cost-effectiveness of default vs inferential accounts of narrowing in the case of scalar inferences, see Noveck and Sperber, (2007).

¹⁰ “Follow a path of least effort in deriving implications: test interpretive hypotheses in order of accessibility, and stop when you have enough implications to satisfy your expectations of relevance” (Sperber and Wilson, 2002/2012: 276).

3. The continuum of literal, loose and metaphorical uses

Lexical broadening involves the use of a word or phrase to convey a more general concept (with a broader denotation) than the linguistically encoded “literal” meaning. A striking feature of much research in this area is that different interpretive procedures have been proposed for a range of phenomena which could all be seen as varieties of broadening. Thus, approximation is often treated as a case of pragmatic vagueness involving different contextually-determined standards of precision (Lewis, 1979; Lasersohn, 1999). Metaphor and hyperbole are still widely seen as involving blatant violation of a pragmatic maxim of truthfulness, with the use of metaphor implicating a related simile or comparison and the use of hyperbole implicating a related weaker proposition (Grice, 1967/1989). Typically, these accounts do not generalise: metaphors are not analysable as rough approximations, approximations are not analysable as blatant violations of a maxim of truthfulness, and so on. Relevance theorists, by contrast, have been exploring the hypothesis that there is no clear cut-off point between literal use, approximation, hyperbole and metaphor, but merely a continuum of cases of broadening, which are all understood in the same way, using the same relevance-guided comprehension heuristic described above (footnote 9) (Carston, 1997, 2002; Wilson and Sperber, 2002; Wilson and Carston, 2006, 2007, 2008; Sperber and Wilson, 2008; Carston and Wearing, 2011; Wilson, 2011a). On this approach, approximation, metaphor and hyperbole are not natural kinds, which are dealt with by different mechanisms, and there is no fact of the matter about what is “really” a metaphor or hyperbole and what is not. In classifying our corpus data, then, we used “approximation”, “hyperbole” and “metaphor” not as theoretical terms but as handy descriptive labels to pick out a range of more or less prototypical examples, in line with standard rhetorical practice.

To illustrate, consider the (invented) utterance in (7):

(7) The sea is *boiling*.

This might be intended and understood literally (as indicating that the sea is at or above boiling point), as an approximation (indicating that the sea is close to boiling point), a hyperbole (indicating that the sea is hotter than expected or desired) or a metaphor (indicating that the sea, while not necessarily hot, is bubbling, churning, emitting vapour, etc.). The issue is whether these are theoretically distinct interpretations involving different interpretive procedures, or whether they merely occupy different points on a continuum, and are all understood in the same way, by broadening the linguistically-specified meaning in order to satisfy expectations of relevance.¹¹

To provide some evidence which might help to choose between these approaches, we focused on the adjectives *boiling*, *raw*, and *painless*, all of which are strictly defined but often loosely or metaphorically used. The results showed that broadening is not rare in language use. In fact, in the cases of *boiling* and *painless*, loose uses predominate:

Relative Frequency of Literal and Loose uses of *boiling*:

Type of use	Frequency in % terms
Literal	49.4%
Literal or Approximate	14.2%
Loose (i.e. non-literal)	36.1%

Relative Frequency of Literal and Loose uses of *painless*

Type of use	Frequency in % terms
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¹¹ For more detailed accounts of how lexical broadening applies in the case of *boiling*, see Wilson and Carston (2007); Sperber and Wilson (2008).

Literal	20.2%
Literal or Approximate	15.7%
Loose (non-literal)	64.0%

The results for *painless* illuminate the relation between literal use and approximation in unexpected ways. Consider (8):

- (8) *In a discussion of euthanasia*: I would want something clean and *painless*: no botch-ups. It would be the doctor or no one.

Here, the denotation of *painless* is plausibly understood as including not only cases in which the procedure was strictly and literally *painless*, but also those involving a small amount of physical pain, which would still be insignificant compared to the distress the patient would have to go through if allowed to die naturally. In other words, the linguistically encoded concept PAINLESS is broadened to PAINLESS*, whose denotation includes, but goes beyond, instances that are strictly and literally PAINLESS. Around 16% of all uses of *painless* fell into this category, with strictly literal uses making up around 20%.

From a theoretical point of view, “approximations” are sometimes seen as excluding the possibility of a literal interpretation (as, for instance, describing an object as *squarish* would generally be understood as excluding the possibility that it is strictly and literally SQUARE). However, the frequency of cases such as (8), which are indeterminate between literal and “approximate” interpretations, suggests that many loose or approximate uses of words involve a type of broadening from which the denotation of the linguistically encoded concept is not automatically excluded.¹²

Our findings for *boiling* show in more detail the form that the continuum of literal and loose uses of the same word might take. In a total of 332 occurrences, we found 164 cases which could only be understood literally (to mean ‘at or above boiling point’), as in (9):

- (9) Poached eggs come out well in a small dish using *boiling* water.

There were a further 47 cases in which either a literal or an approximate interpretation would be appropriate, as in (10):

- (10) Cover the cake with the icing, smoothing with a knife dipped in *boiling* water.

By contrast, there were only 4 cases where an approximate interpretation would be appropriate and a literal interpretation would not, as in (11):

- (11) For sauce, melt chocolate (...) over *boiling* water, then beat until smooth.

(Those of you who have tried to melt chocolate in a bain-marie might already know that if the water in the bain-marie is literally boiling, chocolate will not melt but crumble.)

Towards the figurative end of the continuum, we found 80 cases where *boiling* was metaphorically used, as in (12):

- (12) (...) several small boats disappeared in *boiling* seas (...).

¹² On this approach, cases where approximation is understood as excluding the possibility of a literal interpretation would result from a combination of narrowing and broadening – again providing evidence for a unified approach.

There were 4 clear cases of hyperbole, as in (13), and 13 cases in which metaphor and hyperbole were combined, as in (14) (where *boiling* indicates a higher-than-desired temperature, but is loosely applied to something that is not a liquid):

(13) Bring some more ice, this whisky is boiling hot (...).

(14) This summer is promising to be long and boiling (...).

Finally, there were 19 cases that would be traditionally classified as synecdoche, as in (15) (we will not consider the theoretical analysis of synecdoche here):

(15) You're changing small things like boiling a kettle (...).

Note also that the metaphorical uses of *boiling* were quite varied. More specifically, we found metaphors indicating:

- anger and emotional frustration, as in (16):¹³

(16) The brothers, seemingly stable, are absolutely *boiling* inside with various frustrations (...)

- excessive heat, as in (17):

(17) This summer is promising to be long and *boiling* (...).

- tension, as in (18):

(18) Cup final, against anyone Pakistan relations almost at *boiling* point (...).

- and finally, movement or appearance (typically of water or clouds), as in (12) (repeated here for convenience):

(12) (...) several small boats disappeared in *boiling* seas (...).

These results provide some evidence for our view that there is a continuum of cases of broadening, and that the degree and direction of broadening are heavily context-dependent.

Our corpus data highlight two important differences between the Gricean and relevance-theoretic approaches to broadening. First, Grice retains a sharp distinction between literal and figurative uses inherited from classical rhetoric, and like many philosophers of language (e.g. Lewis, 1979), he treats loose talk and rough approximations as falling on the literal rather than the figurative side (to be analysed as involving contextually-determined standards of precision rather than blatant violation of a maxim of truthfulness). Second, he sees figurative uses (e.g. metaphor and hyperbole) as not contributing to truth-conditional content or “what is said”, but merely to what is implicated. On this approach, the speaker of the metaphorical (12) above would have made no assertion, but merely implicated that several small boats disappeared in seas that resembled boiling liquid. By contrast, relevance theorists deny that there is a clear theoretical distinction between literal and figurative uses, and treat the ad hoc concepts derived via lexical-pragmatic processes (e.g. BOILING*, PAINLESS*) as contributing to truth-conditional content (explicatures) across the whole “literal-figurative” continuum.

¹³ Cognitive linguists would treat this as a case of conceptual metaphor. On the relation between cognitive linguistic and relevance-theoretic treatments of metaphor, see Wilson (2011a).

In the light of this, consider the use of *painless* in (8) above (repeated here for convenience), or in the simpler (invented) example in (19):

- (8) *In a discussion of euthanasia*: I would want something clean and *painless*: no botch-ups. It would be the doctor or no one.
- (19) *Dentist to patient*: The injection will be *painless*.

We have analysed *painless* in (8) as conveying either its literal meaning PAINLESS ('with no pain') or an approximation, PAINLESS* ('with almost no pain'). But the presence of the small amount of pain that would justify classifying *painless* in (8) or (19) as an approximation shades off imperceptibly into the amount of pain that would justify classifying it as a hyperbole, PAINLESS**, ('with less pain than expected or feared'). The Gricean framework predicts that this imperceptible shading off gives rise to a dramatic difference in processing on either side of the approximation/hyperbole divide: on the one side, the speaker is making a genuine assertion, albeit under reduced standards of precision, whereas on the other side, she is merely *implicating* that she would want a death that wouldn't hurt too much or is offering an injection that won't hurt too much. To our knowledge, there is no experimental evidence whatsoever of such a dramatic processing difference between different degrees of broadening. In the relevance-theoretic framework, by contrast, where both approximation and hyperbole contribute to truth-conditional content or "what is said", this imperceptible shading off between approximation and hyperbole is both predicted and explained.

4. Questions about literal meaning

In all our searches, we were forcibly reminded of the elusiveness of encoded "literal" meaning. We embarked on each search with what felt to us like fairly strong intuitions about the literal meaning of the given word-set, but before long, these intuitions started to waver under the weight of the extremely diverse, thoroughly context-sensitive and remarkably creative facts of language use. We will illustrate this point by considering the case of *raw*.

We began our search with the clear intuition that the encoded meaning of *raw* is NOT COOKED. Faced with the diversity of the 308 concordances that we looked at, we had no option but to question this intuition. Utterances of *raw* meaning NOT COOKED make up only 2% of all the examples we examined, with a striking 98% looking more like this:

Raw power, raw immediacy, raw skin, raw edges, something raw and honest, raw wood, raw adrenalin, raw noise, raw and wired experience, raw deal, raw humour, raw appeal, raw emotion, raw nerve, raw data, something raw and pure, raw big band brilliance, raw recruits, raw art, raw passions and (...) a sense of raw being.

The fact that the collocation *raw materials* makes up a good proportion of all such metaphorically-used examples made us consider the possibility that *raw* has taken on a broader literal sense, meaning NOT PROCESSED. In (20a-c), for example, the use of *raw materials* feels rather literal, although *raw* does not here mean NOT COOKED:

- (20) a. (...) the swallowing up of exploitable territory, populations, *raw materials* and markets by commercial capital (...).
- b. (...) explain how perfumes are constructed, show you the *raw materials* and invite you to experience the constituents (...).
- c. (...) duty free import of machinery and *raw materials* (...).

By contrast, in (21a-b) the use of *raw materials* feels closer to the metaphorical end of the continuum:

- (21) a. [it's] up to the couple to build a solid foundation out of the *raw* materials provided (...). Respect, mutual value, domestic sharing (...).
b. (...) all the *raw* material for this crisis has been around since 1988.

We decided to see if historical investigations might help. According to the OED, the etymological root of *raw* comes from the Gr. κρέας and Skr. *kravíš*, meaning RAW (i.e. UNCOOKED) FLESH. However, in Romance languages like French and Spanish, as well as in Greek, a large number of the metaphorical uses found in English would not be acceptable. This led us to think that *raw* in English might indeed have taken on a broader encoded sense, meaning NOT PROCESSED. On this approach, the proportion 2% Literal use to 98% Loose use in our corpus sample changed into roughly 32% Literal use to 65% Loose use.

One of the most interesting aspects of this search was the way in which the contrast between intuitions and corpus evidence brought to the surface intriguing questions about lexical semantics. Has the formerly ad hoc concept NOT PROCESSED (arrived at by broadening the original encoded meaning NOT COOKED) now replaced or supplemented the earlier meaning of *raw*? If *raw* has taken on this broader lexical sense, why did our initial intuitions lead us to declare with relative conviction that *raw* means NOT COOKED? And how should one account for the instability of these intuitions across individuals in our research group (some had stronger intuitions than others that *raw* means NOT COOKED) and across times (we observed significant changes in intuitions about literal meaning within individuals across times or faced with different examples)?

An important advantage of the relevance-theoretic approach to word meaning is that it explains how communication can be successful even among speakers whose representations of encoded lexical meanings are not homogeneous, and indeed vary considerably (see Sperber and Wilson, 1998, 2008; Wilson and Carston, 2007). Suppose that for some speakers *raw* has the encoded meaning NOT COOKED. Given the context-dependence of lexical-pragmatic processes, they should have no difficulty broadening it in appropriate circumstances to mean NOT PROCESSED. Suppose that for other speakers, *raw* has the encoded meaning NOT PROCESSED. Again, given the context-dependence of lexical-pragmatic processes, they should have no difficulty narrowing it in appropriate circumstances to mean NOT COOKED. Finally, suppose that for still other speakers, *raw* is now polysemous, with two encoded meanings, NOT COOKED and NOT PROCESSED. These speakers should have no difficulty arriving at the appropriate meaning in appropriate circumstances, this time by disambiguation rather than lexical adjustment. By the same token, *painless* may have the narrower lexical meaning WITHOUT (PHYSICAL) PAIN for some speakers, and the broader lexical meaning WITHOUT (PHYSICAL OR MENTAL) PAIN for others. On the relevance-theoretic approach, such variations are to be expected, and should pose no threat to communication as long as speakers can converge on the same sense on a given occasion of use.

So far, all our searches have shown considerable context-sensitivity in the way lexical items were understood. All have confirmed our view that lexical narrowing and broadening are not incidental occurrences to be abstracted away from, but are fundamental to language use.

In the brief synopsis to follow, we will use a corpus-based analysis of the adjective *empty* to show how lexical narrowing and broadening may combine in the interpretation of a single word.

5. A corpus based investigation of narrowing and broadening: *empty*

We start from the assumption that the lexical meaning of *empty* is EMPTY, an absolute concept denoting the set of items that contain nothing all. The adjective *empty* occurs in all the subcorpora of the Bank of English in a total of 2336 concordances. To make the search manageable, we decided to focus on the 89 relevant examples in the subcorpus Ukephem (which consists of ephemera – leaflets, adverts, etc) as we were more interested at that stage in colloquial/spoken language oriented samples.

Our hypotheses were, first, that encoded word meanings typically undergo narrowing or broadening in the course of comprehension, and second, that these departures from encoded meaning take place in different directions and to different degrees. Thus, we expected to find that the encoded concept EMPTY was consistently adjusted to denote a more fine-tuned type and degree of emptiness (EMPTY*, EMPTY**, etc.). The sorts of variations we expected to find were (a) variations in the type of content that the item is understood to be empty of (e.g. EMPTY OF WINE, EMPTY OF WATER, etc.) and (b) variation in the degree to which that content is understood as lacking. Our aim was to illustrate the great diversity of ways in which one particular adjective was used, and to show that narrowing and broadening are flexible enough to present challenges to any default account.

Findings for *empty*

(a) Word meanings are narrowed in different directions and to different extents

Our investigation of *empty* illustrates all three points discussed above. In all the utterances we investigated, the lexical meaning was narrowed in different directions and to different extents. In each case, the encoded concept EMPTY was adjusted to represent a more fine-tuned kind of emptiness. Compare, for instance, the following utterances:

(23) Later in the year, when the granaries are *empty*, families have to return to the market to buy grain.

(24) But whatever you do, don't play sport on an *empty* stomach or after a heavy meal.

Neither (23) nor (24) involves a strict use of *empty*. If nothing else, the empty granaries must at least contain air, and the empty stomach gastric fluids. It therefore seems plausible to assume that in the first case the communicated concept is the narrower one EMPTY OF GRAIN and in the second the narrower one EMPTY OF RECENTLY RECEIVED FOOD. Such fine-tunings occur repeatedly throughout our search. In each case, the audience brings to bear different contextual assumptions in specifying the type of contents to be understood as lacking.

(b) Variation across discourse contexts

It follows from our arguments of the last two sections that the concept communicated by use of *empty* may vary considerably across contexts. The sample of discourse contexts available for *empty* in the Bank of English is very diverse. Unlike with *red eyes*, where certain contexts (e.g. fatigue, crying, etc) tend to recur rather frequently, there is much greater contextual variation in the uses of *empty*. With the exception of just a few recurring contexts (empty stomach, property empty of tenants, bus empty of passengers and a few others) all the discourse contexts we examined are one-off occurrences. The relatively high proportion of one-off uses favours a highly context-sensitive inferential approach to lexical narrowing, such as the one we propose, rather than a neo-Gricean approach based on an appeal to generalised conversational implicatures, as discussed in section 2 above.

(c) Variation within discourse contexts

Our investigation of the word-set *red eyes* revealed a potential problem for our hypothesis about the creativity and context-dependence of word use: there was a noticeable relative constancy in the direction of narrowing within a given type of discourse context. Although the degree and direction of narrowing regularly varies across contexts, within a given context narrowing seems to go in roughly the same direction, and to roughly the same degree. In all 14 cases of crying and all 6 cases of fatigue, for example, the shade of red the speaker would be taken to have conveyed, and its distribution over the surface of the eye, is roughly the same. Our sample did not reveal even a single case in which internal variation within a given discourse context could be observed. Our hypothesis at that point was that the lack of variation related to the sample available in the Bank of English for *red eyes*, or the limited range of respects in which eyes can be plausibly described as red, rather than to some general fact about the behaviour of narrowing or the behaviour of discourse contexts themselves.

This was confirmed by our search on *empty*, which revealed at least one case in which significant variation occurs in the direction of narrowing within the same broader discourse context (a discussion of empty property). Compare (24) and (25):

- (24) (...) opening up to homeless people, the thousands of *empty* properties we know they have on their books.
(25) She was eventually housed, but in a completely *empty* flat.

Although in (24) *empty property* is understood as conveying EMPTY OF TENANTS, in (25) it would clearly be understood as conveying EMPTY OF FURNITURE. We take this as evidence that variation in the direction of narrowing occurs not only across but also within types of discourse context.

(d) Interaction between broadening and narrowing

An interesting issue for lexical-pragmatic theories is how broadening and narrowing interact. It seems plausible to assume that both broadening and narrowing can apply in the interpretation of a single monosemous item. According to Wilson and Carston (2006, 2008), for instance, the metaphorical use of *princess* to convey PRINCESS*(i.e. 'spoiled, indulged person unwilling to undertake menial chores') involves not only a broadening of the denotation of *princess* to include some people who are not princesses, but also a narrowing to include only that subset of princesses who are spoiled, indulged etc. For frameworks in which narrowing and broadening are treated as distinct processes, this raises the question of whether narrowing and broadening apply sequentially, and if so, in what order. In the case of *empty*, it seems that first the encoded concept has to be narrowed by specifying the relevant type of content, and only then can it be positioned at an appropriate point on the loose-literal-metaphorical continuum. Thus, consider (26):

- (26) remember to take with you any *empty* tablet bottles or containers to show what has been (...).

Here, the discourse context in theory permits either a literal or an approximate interpretation. So we might suppose that *empty* is first narrowed to mean EMPTY OF TABLETS. Then, if the utterance would have enough implications to satisfy the audience's expectations of relevance even with a tablet or two still left in the bottle, *empty* will be understood as an approximation; but if relevance enough is achievable only on the assumption that there are no tablets left at all, *empty* will be strictly understood.

Now consider the following examples:

- (27) [clues] that your child has been sniffing include: finding *empty* butane, aerosol or glue cans (...).
(28) (...) the three of us are sharing a room with pizza remnants, *empty* wine bottles and flagging concentration (...)
(29) (...) opening up to homeless people the thousands of *empty* properties we know they have on their books.

Again, it might seem plausible to assume that *empty* is first narrowed to mean, say, EMPTY OF WINE, EMPTY OF AEROSOL, etc., and then broadened in contextually appropriate ways. However, given our knowledge of the world, it is hard to imagine a wine bottle or an aerosol can being completely and utterly empty of wine or aerosol (assuming it has been used to store wine or aerosol at all). Typically, even an "empty" wine bottle or aerosol can will show traces of their original contents, which rules out a strictly literal interpretation. In such cases, only approximate interpretations seem acceptable.

Example (29) raises just the opposite problem. For a property to be appropriately described as *empty* in the sense of EMPTY OF TENANTS, it is imperative that not even a single tenant remains. Whereas the presence of minute traces of wine or aerosol would generally be inconsequential enough for (27) or (28) to be regarded as true, or true enough, the presence of even a single tenant in an otherwise empty property has significant social and legal consequences; so (29) would be regarded as false and misleading, rather than "true enough", if a single tenant

remained. This type of context leaves no room for lexical broadening, and approximate uses of *empty* in this sense are generally ruled out.

These examples show that the extent to which the contextually relevant contents must be present or absent for something to be appropriately described as “empty” of it is itself heavily context-dependent. Relevance theory helps to explain the appropriateness judgements involved: while the presence of a tablet or two in an otherwise empty bottle would falsify very few of the implications on which the relevance of the description “empty tablet bottle” depends (and the description is therefore relevant enough), the presence of a tenant or two in an otherwise empty property would falsify most or all of the implications on which the relevance of the description “empty property” depends (making the description irrelevant). These cases provide some support for the view that lexical narrowing and broadening are not distinct processes, but merely outcomes of a unitary process of mutually adjusting explicit content, context and implicatures in order to satisfy expectations of relevance (Sperber and Wilson, 1998; Wilson and Sperber, 2002).

To summarise, our 89-line sample of the adjective *empty* contained:

- (a) 26 lines (29.2%) in which *empty* could be interpreted either literally or approximately,
- (b) 38 lines (42.7%) in which only a literal interpretation would be plausible,
- (c) 14 lines (15.7%) in which only an approximate interpretation would be plausible, and
- (d) 11 lines (12.4%) where *empty* is interpreted metaphorically.

(e) Metaphorical uses of *empty*

As with all the other terms that we looked at in the corpus, the metaphorical uses we found for *empty* (as either an adjective or a verb) were quite varied:

- (30) a. Sugar gives you *empty* calories.
- b. Shelter is hard to find and *empty* days are spent wandering the streets.
- c. [When] a smoker is deprived of a cigarette he or she will feel *empty* and restless at first.
- d. Otto Ritter, a German archaeologist working in the *Empty* Quarter.
- e. (...) at a price to stock your wardrobe and not *empty* your pocket.
- f. (...) photo The *Empty* Raincoat CHARLES HANDY.
- g. Sit back, *empty* your head of foolish thoughts and just close your eyes.
- h. Try to *empty* your mind of anxious or guilty thoughts.
- i. Abasio turned aside to *empty* his stomach, noisily and messily.
- j. Law has become a target of efforts to *empty* it of intrinsic meaning.
- k. Life without letters from you would be much colder and *emptier* than it is.

(f) The meaning of *empty*: absolute or underspecified?

The data briefly presented above raise several theoretical questions about the encoded meaning of *empty*. One possible approach would be to treat the word *empty* (as we have done) as meaning ‘containing nothing at all’, and thus as encoding an absolute concept that is rarely strictly satisfied in nature. It would then follow that on every normal occasion of use, some broadening of the denotation of the encoded concept takes place.

Another possible approach would be to treat *empty* as encoding an underspecified concept, or “pro-concept”, such as EMPTY OF X, where X must be pragmatically supplied (Sperber and Wilson, 1998; Carston, 2002; Wilson, 2011b). It would then follow that in at least some cases (those where the pragmatically inferred contents may indeed be entirely lacking, e.g. a classroom completely empty of pupils) the under-specified term *empty* may well be strictly and literally used. It is a genuine question for lexical semantics how to choose between

these two analyses – if we need to, of course, given the remarks above about possible variations in the encoded meanings of *raw*.¹⁴

6. Concluding remarks

Our corpus studies (limited though they are) provide some support for a unitary account of lexical-pragmatic processes. They confirm that lexical narrowing and broadening are highly flexible and context-dependent processes which can combine in the interpretation of a single word, and support the view that there is a continuum of cases between literal, approximate, hyperbolic and metaphorical use. In section 2, we have tried to show that Levinson's neo-Gricean approach to stereotypical narrowing is not obviously more cost-effective than the unitary relevance-theoretic approach, and offers no clear explanation for more flexible, context-sensitive cases at all (see footnote 5). In section 3, we have tried to show that the standard Gricean framework (which offers no treatment of lexical narrowing) predicts a dramatic processing difference between a metaphorical or hyperbolic interpretation of a certain expression (e.g. *painless*) and a literal or approximate interpretation, whereas the unitary relevance-theoretic account predicts an imperceptible shading off between approximate and hyperbolic interpretations, and this prediction is borne out by our data. In section 5, we have tried to show that narrowing and broadening frequently combine in the interpretation of a single expression (e.g. *empty*), and some general account of the contextual factors that trigger broadening, narrowing or both broadening and narrowing is needed.

All this suggests that the goal of an adequate pragmatic theory should be to provide a unitary account of the full range of lexical-pragmatic processes. However, largely as a result of historical accident (perhaps combined with differences in intellectual taste), the only explicit attempts so far at developing such an account have been made within the relevance-theoretic framework. Neo-Griceans working on lexical narrowing have shown little interest in extending their account to cover metaphor or hyperbole; philosophers and literary scholars working on metaphor and hyperbole have shown no interest in extending their account to approximation or narrowing, and so on, and semanticists and logicians working on approximation have shown little interest in metaphor or hyperbole. Our claim is not that relevance theory offers the only possible unitary account: the challenge is to propose a better one.

Our corpus studies also raise a number of practical and theoretical issues, and we will end by briefly outlining some of these. The first is about the value of corpus data as a complement or corrective to intuitions. According to Stubbs (2001: 72), pragmatic intuitions may be particularly in need of complementation or correction:

”It may (...) be that intuitions about the core meaning of a word are reliable, but that intuitions about its potential use in different situations are not.”

This view is echoed by Noveck and Sperber (2007/2012: 307-8):

It makes sense (...) to judge a semantic description by its ability to account for semantic intuitions. Of course, the use of semantic intuitions (...) raises methodological problems, and calls for methodological caution. (...) Still, there are good reasons why semantic intuitions are so central to semantics. Semantic intuitions are not just *about* semantic facts, they are themselves semantic facts.

¹⁴ Recanati (2010, chapter 2) treats *empty* as polysemous, with two conventional senses: an absolute sense (EMPTY) meaning ‘containing nothing at all’, and an approximate sense which accounts for loose uses and makes it possible to describe items as more or less “empty”. However, he does not consider the type of cases we have discussed here, where both narrowing and broadening apply to the same item, and it is not clear how they would fit into his framework.

With pragmatics, the case is different:

It is a mistake to believe that the type of pragmatic intuitions generally used in pragmatics are data of the same kind as the semantic intuitions used in semantics. Genuine pragmatic intuitions are the intuitions hearers have about the intended meaning of utterances addressed to them. However, the pragmatic intuitions appealed to in theoretical pragmatics are not normally about actual utterances addressed to readers of a pragmatic article, but about hypothetical cases involving imaginary or generic interlocutors. (...) These intuitions are educated guesses (...) about hypothetical pragmatic facts, but they are not themselves pragmatic facts, and they may well be in error. That is, we may be wrong about how we would in fact interpret a given utterance in a given context. (ibid.: 308)

The pragmatic intuitions we have relied on in analysing our corpus data fall midway between the types of case that Noveck and Sperber describe. On the one hand, these intuitions are about actual utterances, produced in actual situations. On the other hand, those utterances were not addressed to us, which puts us in the position of overhearers rather than actual addressees. As a result, the pragmatic intuitions they give rise to are still to some extent about hypothetical pragmatic facts, and are open to error or influence by our prior theoretical commitments. This seems to be an unavoidable feature of the use of corpus data in lexical pragmatics.

Second, although the flexibility and context dependence of lexical-pragmatic processes favour inferential accounts of lexical adjustment, they are quite compatible with the idea that adjustments may become more or less standardised or routinised, to a point where they may give rise to an extra lexicalised sense (for either an individual or a group). This raises a number of issues about the mechanisms involved: at what point does an ad hoc concept start becoming routinised or lexicalised? How can corpus data or historical linguistic facts shed light on this process? What are the costs and benefits that encourage or impede routinisation or lexicalisation (Vega Moreno, 2007)?

Finally, many corpus linguists tacitly or explicitly adopt a “use” theory of semantics in which the use of a word gives direct insight into its meaning. By contrast, most people working on lexical pragmatics assume that the interpretation of a word or phrase in context involves an interaction between semantic and pragmatic factors, so that the relation between encoded lexical meaning and the meaning communicated by use of a word in context may be much less direct. This in turn raises important issues about the division of labour between semantics and pragmatics. As we have seen with *raw* and *empty*, there may be many different representations of the encoded meaning of a given word – some absolute, others underspecified or polysemous – which are descriptively adequate in the sense that they could interact with pragmatic processes of broadening or narrowing to predict the correct range of interpretations. On what basis does an individual acquiring a language choose between them? Here again, the answer is likely to depend on the costs and benefits involved, and corpus data may help to shed some light on what these are.

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