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The lexical pragmatics of count-mass polysemy[*]

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Abstract This paper investigates a subtype of systematic polysemy which in English (and several other languages) appears to rest on the distinction between count and mass uses of nouns (e.g., shoot a *rabbit*/eat *rabbit*/wear *rabbit*). Computational semantic approaches have traditionally analysed such sense alternations as being generated by an inventory of specialised lexical inference rules. The paper puts the central arguments for such a rule-based analysis under scrutiny, and presents evidence that the linguistic component provided by count-mass syntax leaves a more underspecified semantic output than is usually acknowledged by rule-based theories. The paper develops and argues for the positive view that count-mass polysemy is better given a lexical pragmatic analysis, which provides a more flexible and unified account. Treating count-mass syntax as a procedural constraint on NP referents, it is argued that a single, relevance-guided lexical pragmatic mechanism can cover the same ground as lexical rules, as well as those cases in which rule-based accounts need to appeal to pragmatics.

Keywords: polysemy, lexical pragmatics, count-mass, Relevance Theory, concepts, procedural meaning

1 Introduction

A central insight of lexical pragmatics is that word meanings undergo pragmatic modulation in the course of utterance interpretation. Consider the italicised word forms in (1)-(5):

(1)   Mary was hungry and *opened* the grapefruit.

(2)   Emma had a difficult first year at university. She didn't get enough *units* to continue.[1]

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1 Example due to Carston (1988: 145)

(3)   After the phone call with her ex-boyfriend, Jane came out of the room with *red* eyes.

(4)   I think it's best to let the baby sleep in his room. It's *boiling* outside.

(5)   Peter will no doubt make it to the top. He's a *lion*.

Lexical pragmatic accounts treat (1)-(5) as instances of linguistically-encoded meanings being pragmatically fine-tuned by way of specification or generalisation of conceptual content, in accordance with the situation of utterance (Blutner 1998, 2002, Bosch 1983, 1994, 2007, Carston 2002, 2010, Gibbs 1994, Levinson 2000, Murphy 2002, Recanati 1995, 2004, 2016, Sperber & Wilson 1998, 2008, Travis 1985, 2008, Wilson & Carston 2006, 2007). Although the accounts may differ with regard to the specifics of the mechanism(s) they take to be responsible for such lexical adjustment, they share the idea that the contents communicated by the italicised expressions in (1)-(5) cannot be derived on the basis of linguistically-encoded meaning alone. This view, sometimes referred to as truth-conditional pragmatics (e.g., Carston 2002, Recanati 2010), considers encoded sentence meanings to fall short of yielding truth-conditional contents (even after disambiguation and reference resolution), and pragmatic inference to be required for the hearer to bridge the gap between underspecified linguistically-encoded meanings and the propositions expressed (i.e., the communicated meaning or truth-evaluable content) by speakers on given occasions.[2] Lexical pragmatics, then, addresses semantic underdeterminacy manifested at the level of individual words. For instance, in the case of *open* in (1), the idea would be that real-world knowledge associated with the object denoted by the direct object of the verb provides the hearer with clues regarding the sort of opening it expresses (e.g., to open a grapefruit typically involves removing its skin), and contributes to a specification (narrowing) of the more general concept encoded by the verb. Also, depending on the context, further specification of the concept expressed may be required: for instance, opening a grapefruit for eating may involve peeling it, opening it for use in a juice squeezer may involve slicing it in two, etc. Moreover, as pointed out by several authors (Bosch 1994, Searle 1983, Sperber & Wilson 1998), the range of possible specifications in meaning for this verb (e.g. *open* a book, a dishwasher, a bottle of wine, a pair of curtains, one's mouth, a conference, a word document, etc.) makes it seem unlikely that the lexicon should store all of them, and so at least a considerable number of them must be pragmatically inferred

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2 A fundamental debate within the field of linguistic communication concerns the notion of truth-conditional content, and whether it is a property of sentences (i.e., linguistically-encoded meanings), or utterances (i.e., speaker meanings). It should be noted at the outset that my position on this issue, reflected throughout this paper, is the latter. See for instance Carston (2002: Chapter 1) for a comprehensive defence of the 'pragmaticist' idea that sentence meanings massively underdetermine speaker meanings, which are taken to be the bearers of truth-conditional content.

on the basis of world knowledge and/or the situation of utterance. Similarly, the specification of the meaning of the noun *units* in (2), and the shade and distribution of *red* in (3),[3] the loose use of *boiling* in (4) and the metaphorical extension of the concept encoded by *lion* in (5), each requires the addressee to take his world knowledge and the situational context into account in deriving the speaker-intended meaning (e.g., Wilson & Carston 2007; for a range of attested examples, see Kolaiti & Wilson 2014).[4]

Lexical pragmatic processes are thought to play a central role in giving rise to the phenomenon of *polysemy*, where a single word form is conventionally or contextually associated with several related meanings (e.g., Falkum 2011, Hopper & Traugott 1993/2003, Sperber & Wilson 1998, Taylor 2003). The prevalence of polysemy in natural languages suggests that there is pressure on the lexicon to extend a finite set of words to new functions rather than to invent new words for each sense (Murphy 2002: 406), and lexical pragmatic processes play a key role in enabling communicators to do this.[5] Indeed, some 'radical' pragmatic accounts tend to see polysemy as an epiphenomenon of pragmatic processes operating at the level of individual words: "In general ... polysemy is the outcome of a pragmatic process whereby intended senses are inferred on the basis of encoded concepts and contextual information" (Sperber & Wilson 1998: 197).[6] While the important contribution of pragmatics to lexical interpretation has become increasingly recognised, even among the most ardent defenders of formal lexical semantic theories (Asher 2011), there appears to be wide agreement that there is a certain type of polysemy, often referred to as 'systematic' or 'regular', that does not lend itself to a pragmatic analysis (Copestake & Briscoe 1992, 1995, Rabagliati et al. 2011). In systematic polysemy,

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3 So-called indexical approaches to lexical meaning, first introduced by Peter Bosch in a series of publications (e.g., Bosch 1983, 1994, 2007), treat the variation in truth-conditional content that colour adjectives give rise to as resulting either from a hidden variable in their logical form (Kennedy & McNally 2010, Szabó 2001), or from their being fully indexical predicates (Bosch 1983, Rothschild & Segal 2009). A pragmatic counterpart to such indexical approaches is Wilson's (2011) proposal that in fact *all* content words (e.g., *red*, *lion*, *open*) encode a procedure for constructing context-specific senses on the basis of the encoded conceptual content and contextual assumptions. While the pragmatic approach I take in this paper is closely linked to that of Wilson, an indexicalist approach might be a promising option for spelling out in more formal terms the variations in truth-conditional content that systematic polysemy gives rise to.

4 Some contemporary theories of lexical pragmatics defend a 'deflationary' approach to metaphor, which they take to involve the same pragmatic mechanism(s) as do other types of adjustments of lexical meaning such as specification and broadening (see, e.g., (Recanati 1995, 2004, Carston 1997, 2002, Wilson & Carston 2006, 2007, Sperber & Wilson 2008)).

5 In the case of conventionally polysemous senses, identifying the pragmatic process responsible for the existence of the related senses would be a matter of diachronic analysis (Traugott & Dasher 2002)

6 Sperber and Wilson were discussing cases like the ones in (1)-(5), which can be analysed in terms of specification/narrowing or broadening of conceptual content.

the related senses of a word can be predicted from the ontological or 'real-world' category of its denotation. Examples are terms for animals used to denote the meat of the animal (*Chicken is healthy*), names of cities used to denote the inhabitants of the city (*Cambridge voted conservative*), terms for fruits used to denote the tree carrying the fruit (*I have a cherry in my garden*), and many more (see Dölling forthcoming for an overview). Such cases are standardly treated as being linguistically generated by a set of lexicon-internal rules of sense extension. An apparently strong case for a lexical rule-based analysis is the subtype of systematic polysemy that in English, and several other languages, patterns with the syntactic count-mass distinction (henceforth *count-mass polysemy*), as illustrated by (6)-(9):

(6)   a.   *A rabbit* jumped over the fence. ('animal')
        b.   They serve *rabbit* at the River Café. ('meat')
        c.   . . . *turkey*, *halibut*, *reindeer*, *frog*, etc.

(7)   a.   We have *a pine* in our garden. ('tree')
        b.   This table is made of *pine*. ('wood')
        c.   . . . *olive*, *cherry*, *chestnut*, *birch*, etc.

(8)   a.   Karen promised she would cook *pasta* tonight. ('food')
        b.   Karen made us *a delicious pasta*. ('food portion')
        c.   . . . *risotto*, *soup*, *steak*, *stew*, etc.

(9)   a.   Joan likes to drink *beer*. ('drink')
        b.   Could I have *three beers*, please? ('drink serving')
        c.   . . . *water*, *martini*, *coke*, *cappuccino*, etc.

Rule-based approaches typically take the effect of the lexical rules to be to change the value of a +COUNT or +MASS feature in the lexical representation of the noun, thereby altering its denotation accordingly. Within many lexical semantic frame-works, the rules are taken to come with specific interpretive predictions based on lexically stored information, so that for instance, a mass use of an animal term would have a meat sense as default, a count use of a liquid term would have a conventional serving sense as default, and so on (e.g., Asher 2011, Asher & Lascarides 2003, Copestake & Briscoe 1992, 1995, Gillon 1992, 1999, Kilgarriff 1995, Kilgarriff & Gazdar 1995, Ostler & Atkins 1992, Pustejovsky 1991, 1995). Advocates of this sort of approach often claim that lexical rules are required to account for the availability of 'default' senses in uninformative contexts, and to explain the productivity and morpho-syntactic consequences of systematic polysemy and the parallel that might be drawn with morphological processes.

This paper puts this widespread view — that the process underlying systematic polysemy is semantic in nature and thus that the sense alternations it gives rise to are linguistically generated — under scrutiny. Focusing on count-mass polysemy, I

argue that rule-based approaches tend to overlook, or at least considerably downplay, the fact that the flexibility observed in lexical interpretation quite generally is also found in these apparently systematic cases, which I will show are both context-sensitive and subject to pragmatic modulation. The paper presents evidence that the linguistic component provided by count-mass syntax to systematic polysemy leaves a more underspecified semantic output than is usually acknowledged by rule-based theories, and that the alternations in meaning that arise can be explained by appeal to pragmatics. Thus, the (bold) claim of this paper is that no specialised lexical semantic rules are required to account for systematic polysemy; instead, the phenomenon has its origin in the operation of more general lexical pragmatic processes. It should be noted that recent computational semantic approaches, particularly work on word meaning in distributional semantics (for overviews, see Clark 2015, Erk 2012), abandon lexical rules in favour of a more empirically oriented approach where large-scale corpus analyses are used to create predictive models for the distribution of a word's (attested) senses (e.g., Boleda et al. 2012, Heylen et al. 2015). While this shift of focus from stipulated lexical rules to models based on actual word usage represents a promising development within computational lexical semantics, there are still many unresolved (and underexplored) issues when it comes to accounting for systematic polysemy. One problematic issue is how to account for senses which are too rare to occur in corpus data (for discussion, see Copestake 2015). Therefore, my focus in what follows will be the classical rule-based theory, which remains the most developed lexical semantic account of systematic polysemy to date and is still widely influential. For instance, its assumptions regarding sense generation and interpretation continue to underlie work on polysemy in psycholinguistics (see, e.g., Frisson & Frazier 2005, Klepousniotou 2002, Murphy 1997, Rabagliati et al. 2010, 2011, Rabagliati & Snedeker 2013).

The paper is organised as follows. Section 2 discusses the rule-based approach to systematic polysemy. The standard arguments underlying this approach are considered, including: (i) the senses are linguistically marked; (ii) the sense alternations are systematic/productive; (iii) the 'blocking' phenomenon, and (iv) the availability of 'default' senses. I argue that each of them can be countered by a plausible pragmatic explanation. Section 3 discusses the syntactic count-mass distinction and proposes an account of how this morpho-syntactic component may interact with the pragmatic interpretive system. I then develop and argue for the positive view that count-mass polysemy can be given a more flexible and unified account within a lexical pragmatic framework. I propose Relevance Theory (Carston 2002, Sperber & Wilson 1986/1995, Wilson & Sperber 2004, 2012) as a suitable theoretical framework for this purpose and argue that a single lexical pragmatic mechanism can cover the same ground as the lexical rules, as well as those cases in which rule-based accounts need to appeal to pragmatics. In Section 4 I discuss how the apparent systematicity of

count-mass polysemy can be reflected on the lexical pragmatic account, through a re-consideration of the standard arguments underlying rule-based approaches.

2 Count-mass polysemy as rule application

Lexical semantic accounts have influentially argued that systematic polysemy is generated by an inventory of specialised lexical inference rules, in this way avoiding a listing of predictable senses in the mental lexicon (Asher 2011, Asher & Lascarides 2003, Copestake & Briscoe 1992, 1995, Gillon 1992, 1999, Kilgarriff 1995, Kilgarriff & Gazdar 1995, Leech 1981, Ostler & Atkins 1992, Pustejovsky 1991, 1995). In a classic paper, Pelletier (1975) posited an abstract, general rule called the UNIVERSAL GRINDER, whose effect was to create from a count noun denoting a physical object a mass noun with properties appropriate for an unindividuated substance. This would yield the 'rabbit stuff' sense in (10) below.

(10)   After the accident, there was *rabbit* all over the road.[7]

The converse operation is performed by Bunt's (1985) UNIVERSAL SORTER (also termed the 'universal packager' by some authors), which turns mass nouns denoting substances into count nouns with properties appropriate for an individuated entity. This would yield the individuated reference of *golds* and *silvers* in (11).

(11)   She studied the seven strongboxes on the shelves. (. . .) The number of *golds* and *silvers* was considerable.[8]

In order to account for count-mass polysemy, many computational lexical semantic approaches treat the UNIVERSAL GRINDER and SORTER as lexical rules on a par with other rules of the grammar (specifically, morphological rules). In addition, they posit a set of conventionalised sub-cases of the rules, which make specific interpretive predictions for count and mass occurrences of nouns. These include, to mention a few, the rules of MEAT GRINDING and FUR GRINDING, which form meat- and fur-denoting mass nouns from animal-denoting count nouns (Copestake & Briscoe 1995, Ostler & Atkins 1992), WOOD GRINDING, which creates wood senses from tree-denoting count nouns (Kilgarriff 1995), and FOOD and DRINK PORTIONING, which convert food- or drink-denoting mass nouns into count nouns denoting a conventional portion of the substance (Copestake & Briscoe 1995):

(12)   MEAT GRINDING: They serve *rabbit* at the River Cafe.

(13)   FUR GRINDING: The model wore *mink* on the catwalk.

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7 Example due to Copestake & Briscoe (1995).
8 Example from Modesitt, L. E. Jr. (2009). *Arms Commander*. New York: Tom Doherty Associates.

(14)   WOOD GRINDING: This table is made of *pine*.

(15)   FOOD PORTIONING: Karen made us *a delicious pasta*.

(16)   DRINK PORTIONING: Could I have *three beers*, please?

In this way, computational lexical semantic accounts take there to be a set of lexical inference rules (the UNIVERSAL GRINDER/SORTER and their various convention-alised sub-cases) in the mental lexicon that is responsible for generating count-mass polysemy as illustrated above. In other words, the shifts in meaning are assumed to have a wholly linguistic basis. Some authors point out that pragmatics may have a role to play in contributing to further contextual specification of the denotation, or, in some cases, in overriding default interpretations (Copestake & Briscoe 1995, Lascarides & Copestake 1998), but it merely serves the function of a useful add-on; the main interpretive work is being done linguistically on the basis of lexical rules.

2.1   Senses are linguistically marked

Perhaps the most compelling argument for a rule-based analysis of count-mass polysemy is that the senses are formally marked in languages such as English, which make a morpho-syntactic distinction between count and mass NPs. So in an utterance of *I love chicken* or *That store sells mink* the absence of determiners provides the hearer with direct evidence of the intended mass interpretation and, rule-based approaches would claim, of the 'meat' or 'fur' interpretation respectively.

That the morpho-syntactic alternation between count and mass occurrences of nouns has important consequences for how the nouns are interpreted is, of course, beyond discussion. The question is rather *what* this linguistic component contributes by way of interpretation-relevant information. As is often pointed out, most nouns appear to exhibit a great degree of flexibility in their ability to occur with both count and mass interpretations (Allan 1980, Bunt 1985, Pelletier 1975, Pelletier & Schubert 2003, Pelletier 2012, Ware 1975). Some illustrations are given below.

(17)   The child brought a book and *a pencil*./The child had *pencil* all over her face.

(18)   We went to the park and sat down at *a bench*./Susie asked me to move over and give her *some more bench*.[9]

(19)   Susan brought *her radio* to the beach./There is *radio* all over the world.

(20)   "Those strawberry pop-tarts are dangerous. I came home one day from work and there was *toaster* in the back yard. It evidently caught fire on one of the

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9 Example due to Wisniewski et al. (2003).

kids and my wife yanked the cord from the wall and heaved it out the back door. Guess what was in *the toaster*."[10]

(21)   She's expecting *a baby*./"I watch these TLC shows about women who didn't know they were pregnant until they went into labor. Some of the stories just absolutely floor me, but I can kind of, sort of see it as possible for a woman who typically gains weight in her tummy not to recognize that the extra bulk there is *baby* instead of food."[11]

(22)   The statue is made of *gold*./Britain brought home an impressive number of *golds* from the Olympics.

(23)   *Back pain* is *a terrible pain*.[12]

In all of the examples above, the count or mass syntax provides an important clue to the intended interpretation of the nouns, but it is also clear that a good deal of pragmatic inference is required to home in on the precise interpretation in those cases where a noun that describes a prototypically countable entity occurs with mass syntax, or where one that describes a prototypically uncountable entity occurs with count syntax. For instance, the NP *some more bench* in (18) has to be interpreted relative to what one knows about the real-world properties of benches (i.e. a flat expanse of space). And an understanding of the mass use of *radio* in (19) or *baby* in (21) requires accessing one's general world knowledge about radios as transmitters of information or about the development of babies in the womb. The examples also show that the count-mass alternation yields interpretations that may go beyond those that can be generated by a UNIVERSAL GRINDER. For instance, the interpretation of the mass occurrences of *pencil* and *radio* above can arguably not be derived through 'grinding' of the physical object described by the count expressions *pencil* (referring to the marks left by its use on the child's face) and *radio* (referring to the transmission of radio signals). Given the high degree of context-sensitivity demonstrated by these examples, it seems that what count-mass syntax provides here is no more than an interpretive clue regarding whether the entity it picks out should be seen as having 'count' or 'mass' properties, but that the pragmatic system is required to fill in the rest. (In Section 3 I return to discussion of what this clue may amount to and more specifically to the notions 'count' and 'mass'.) But notice also that this context-sensitivity applies to many instances of count-mass polysemy that have traditionally been taken to be of the systematic, rule-based kind. Even for the relatively restricted groups of animals, trees and food and drink items, examples where the linguistic alternation between count and mass uses of NPs yields senses that go beyond those

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10 http://www.badmovies.org/forum/index.php?topic=122407.0
11 http://www.hobomama.com/2011/01/feeling-fat-during-pregnancy.html
12 Example due to Bunt (1985).

that can be plausibly claimed to be generated by lexical rules are not difficult to come by. Consider (24)-(29).

(24)   Will a hamster bite if it senses *cat* on my hands? ('particles')

(25)   [Biology teacher]: Now take a look at these different samples. *Rabbit* should be easy to recognise. ('faeces')

(26)   In the old days, *birch* was used to heal wounds. ('bark')

(27)   *Pine* is antiseptic for the respiratory tract and it treats pneumonia, asthma, and other respiratory ailments. ('oil')[13]

(28)   Jane was offered *three wines* at the tasting. ('varietals')

(29)   [Before going home from work, the aquarium employees go through their usual closing routine, which includes checking that the pools have the correct water levels]: Employee A: Have you gone through everything? Employee B: I just need to check *the waters*, then I'm done. ('levels of water')

The intended interpretation of each of the italicised nouns above should be easily inferable in context, and the count or mass use of the noun provides an important clue to this interpretation. But by itself this linguistically encoded information is arguably insufficient; the hearer must also activate his real-world or contextual knowledge in interpreting the nouns. So unless we posit a new rule for each new sense, which does not seem like a satisfactory option, it appears that what is provided linguistically in these cases is something less specific than the rule-based accounts would have it to be.[14] But if lexical rules are not required to interpret the italicised nouns in (24)-(29), then one might ask whether they are really necessary in the alleged 'rule-based' cases or if they can be interpreted on the basis of the same pragmatic mechanism. (Notice also that on the rule-based account, the default interpretations generated by the lexical rules would have to be cancelled and replaced by the appropriate

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13 Example from Edwards, W. D. (1999). *The Aromatherapy Companion*. Storey Publishing.

14 It has been suggested to me that at least some of the examples discussed in this section could be analysed in terms of syntactic ellipsis of the NP head (e.g., *rabbit* in (25) could be an ellipsis for rabbit faeces, given an explicit linguistic antecedent in the prior discourse), and thus that the full conceptual content of the NP can be recovered linguistically without appeal to pragmatic inference. However, most (if not all) cases of count-mass polysemy could, in principle, be analysed in terms of NP ellipsis (even paradigmatic examples such as *John likes chicken* could be seen as elliptical of *John likes chicken meat* given the appropriate linguistic context), which makes it difficult to see how cases of ellipsis should be distinguished from cases of polysemy. Notice also that an utterance of (25) would arguably be natural in a context where there is no explicit linguistic antecedent but where the intended referent is identifiable on the basis of extra-linguistic clues (e.g. where the biology teacher is pointing to a salient exemplar). See Hall (2009) for a comprehensive discussion of the distinction between ellipsis and pragmatic enrichment from a relevance-theoretic perspective.

contextual interpretations in (24)-(29), a step which might be unnecessarily costly in processing terms, although, of course, not impossible). As a further illustration of this interpretive flexibility, consider the various uses of the noun *olive* in (30).

(30)   a.   Mary put an *an olive* in her drink. ('fruit')
      b.   We have *an olive* in our garden. ('tree')
      c.   This table is made of *olive*. ('wood')
      d.   My current colour crush is *olive*. ('hue')
      e.   The bottle to the left is *olive*. ('oil')
      f.   Susan's favourite fragrance is *olive*. ('flower')
      g.   *Olive* is used to treat a person who suffers from tiredness, fatigue and exhaustion due to excessive work or study.[15] ('extract')

The different senses of olive in (30) spring from real-world knowledge about olives: An olive is a small, savoury, green or black fruit that grows on a tree, its wood can be used to make furniture, it develops from a pleasantly scented flower, is used in making vegetable oil, is thought by some to have healing effects, and so on.[16] How many lexical rules would the computational semanticist postulate here? And what would be the criteria for determining, say, that we have to do with a lexical rule (of WOOD GRINDING) in (30c), but with a pragmatically derived sense in (30f)? In other words, what makes the knowledge that olive trees make good wood more 'semantic' than the knowledge that olives develop from flowers, or are thought to have healing effects?[17] It seems that the lexical rules, even if they could be shown to exist, would only be able to account for a subset of the variety of interpretations that the alternation between count and mass uses of nouns may give rise to. A question that arises, then, concerns the theoretical motivation for having lexical rules as part of the interpretive system: what do they add to a theory of utterance understanding by way of explanation? While the morpho-syntactic distinction between count and mass NPs clearly has some important interpretive consequences, these seem to be less specific than rule-based accounts would have them to be. That the sense alternations involved in count-mass polysemy are reflected linguistically therefore does not seem

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15 Example from Costigan, L. (2006). *Women and Healing*, iUniverse.

16 One reviewer pointed out that some of the uses listed in (24)-(30) are mainly possible in cases where there is a highly salient discourse referent and would be less natural if uttered 'out of the blue'. I share the reviewer's intuition here: Given the appropriate contextual circumstances (and I take the presence of a supporting context to be the normal situation in verbal communication) the alternation between count and mass uses of nouns gives rise to a much wider range of interpretive possibilities than rule-based accounts tend to assume, where verbal utterances are typically studied in idealised 'out of the blue' contexts.

17 This illustrates a well-known problem in lexical semantics concerning the cut-off point between linguistic knowledge and general world knowledge, and it is not clear how (or whether) rule-based accounts distinguish between the two.

to provide a strong argument for the existence of lexical rules. A more promising approach, which I will explore in 3 of this paper, is to treat the count-mass distinction as it is manifested in English and other languages as a sort of interpretive pointer or clue, which paves the way for lexical pragmatic creativity.[18]

2.2 Systematicity/productivity of sense alternations

Lexical rule-based accounts offer an explanation for the systematicity and productivity of count-mass sense alternations, that is, for the fact that they systematically target nouns whose denotations involve a specific ontological or 'real-world' category (animals, trees, food and drink items, and so on), and can be extended productively to any new members of that category. For instance, if someone told you about a newly discovered animal of the giraffe family called *swib* ("Yesterday, Attenborough was photographed with *a swib* in Congo. It's a huge animal."), and this was the first time you heard of this animal, you would probably have no difficulties understanding a following utterance containing the novel noun used in a 'meat' sense ("*Swib* is really delicious, by the way — you should try it.") although you would never have come across this usage before. According to rule-based accounts, this suggests the presence of a productive lexical rule.

There is some experimental evidence that people find such conventionalised (allegedly rule-based) sense extensions more acceptable than novel extensions of the meaning of a newly acquired word (Murphy 1997). In an experiment, subjects were exposed to a novel word, followed by its occurrence in a context in which its meaning was extended, either in a conventional or creative (novel) way. An example of a conventional extension was the use of the novel animal term *tonklet* to refer to the meat of the animal, while a novel extension was a use in which it referred to a place where the animal lived. Subjects were asked to judge how appropriate or normal the extended sense of the word was. Results showed, not surprisingly, that subjects were more likely to accept conventional than novel extensions of the meaning of the newly acquired term. While Murphy's results was taken to support the view

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18 In some languages, bare 'count' nouns can appear in internal argument position without receiving a mass interpretation (e.g., Spanish *Lleva jersey*; lit. wears pullover, 'She's wearing a pullover' and Norwegian *Han kjører bil*; lit. he drives car, 'He's driving a car'). The literature contains various proposals for how to analyse such uses, but they are typically regarded as distinct from the mass uses discussed in this paper. For instance, Espinal (2010) analyses such bare 'count' nominals in Spanish and Catalan as denoting number-neutral properties of kinds. Borthen (2003) analyses the corresponding Norwegian uses as being singular but 'type-emphasising', implying nonpartitivity and nonreferentiality. Although English is more restricted with respect to such bare nominal uses in internal argument position, it is an interesting question whether any of the non-individuated uses discussed in this paper could be seen as either number-neutral, property of kind-denoting or 'type-emphasising'. For reasons of space I cannot get into this complex issue here.

that count-mass polysemy arises on the basis of productive rules stored in speakers' mental lexicon — which would explain their preference for conventionalised, 'rule-derived', interpretations over novel, 'unsystematic', ones — it also has a non-linguistic explanation, which takes into account how such conventionalised sense extensions typically reflect real-world regularities (Fodor & Lepore 2002, Rabagliati et al. 2011). Fodor & Lepore (2002: 117) write:

> Suppose it's right that 'lamb' is polysemous between the animal and the meat. Surely that's because lamb-the-meat comes from lamb-the-animal. Surely there just *couldn't* be a word that's polysemous between *lamb-the-animal* and (say) *beef-the-meat*? Or between *lamb-the-animal* and *succotash-the-mixed-vegetable*? That there couldn't may itself sound like a deep fact of lexical semantics. But no; it's just the truism that, the less one can see what the relations between X and Y might be, the more one is likely to think of an expression that is X/Y ambiguous as homonymous rather than polysemous.

Relations such as those between animals and their meat/fur, trees and their wood, food and drink items and their conventional servings, and so on, reflect highly predictable states of affairs in the world, which we are repeatedly exposed to in our daily lives, and they form part of our general world knowledge (stored in long-term semantic memory). Upon encountering a new instance of one of these categories — an unfamiliar animal, say — we can, on the basis of this knowledge, infer that the relation also applies to this instance, and in certain cases that it does not, for instance, if the animal in question is too small to plausibly be appropriate as food or has no fur. Over time, our frequent exposure to such relations might lead to their representations becoming immediately activated when we access specific concepts in appropriate contexts. For instance, accessing the concept TURKEY might immediately result in the activation of the assumption TURKEYS ARE MEAT. The high accessibility of such inherent, frequently encountered relations compared with, for instance, more contingent relations such as that between an animal and its dwelling, which may not be as salient (at least not for individuals living in urbanised areas), might explain the preference observed for conventionalised over novel sense extensions. So instead of being the product of lexical rules, the systematicity and productivity of these sense alternations could be seen as being dependent on, and arising from general world (or encyclopaedic) knowledge of predictable relations. Such a pragmatic explanation would have an advantage over the linguistic one in that there would be a straightforward way of explaining why sense alternations are subject to pragmatic constraints (and why rather than being productive they are in fact 'semi-productive', cf. Copestake & Briscoe 1995); for instance, why animal nouns such as *halibut* and *sphinx* do not, under normal circumstances, have fur senses while *bear* and

rabbit do, why *fairy fly* and *virus* do not usually have meat senses, and so on. Such real-world facts would have to induce exceptions to the rules on the computational semantic account.

2.3   The 'blocking' phenomenon

Another seemingly compelling argument in favour of a rule-based approach is the parallel that might be drawn between lexical rules and derivational morphological processes; both appear to be 'blocked' by the existence of underived synonymous lexical forms (Briscoe et al. 1995, Clark & Clark 1979, Copestake & Briscoe 1992, 1995, Ostler & Atkins 1992). For instance, Aronoff (1976) noted that the form **gloriosity* does not appear in English because it would be synonymous with the existing form *glory* and therefore blocked from being generated. Similarly, the existence of lexicalised forms such as *veal*, *pork*, *beef*, *wood*, and so on, is thought to block the application of the rules, explaining the oddity of the uses below:

(31)   ?John likes to eat *calf/pig/cow*.

(32)   ?This chair is made out of *tree*.

Such lexicalised forms are analysed as exceptions to the lexical rules, by analogy with exceptions to morphological processes. However, as some authors have pointed out (Blutner 1998, Nunberg & Zaenen 1992), unlike most exceptions to morphological patterns, which are normally considered ill-formed and do not occur in ordinary language use, it seems that derived and lexicalised forms of mass expressions co-exist happily in English:

(33)   Hindus are forbidden to eat *cow*. (?*beef*)

(34)   Overall, households that display trees made out of plastic now outnumber households that display trees made out of *tree*. (?*wood*)

(35)   In Asia, *roast suckling pig* is eaten in Chinese or Vietnamese restaurants for important parties. (?*pork*)

Nunberg & Zaenen (1992: 391) consider the example in (33) and argue that the reason the use of *beef* would be odd in this case is that the interdiction concerns the status of the animal in the Hindu religion, and not just its meat: "Hindus are forbidden to eat *beef* only because it is cow-stuff". The mass use of *tree* in (34) is motivated by the fact that it is the Christmas tree's properties as a natural tree (but where its wood properties are only secondary), as opposed to a fake plastic tree, that is at stake in this context. As to the use of the derived form *roast suckling pig* in (35), it is quite conventional and preferable to the lexicalised form *pork*, due to the

semantics of the modifier combined with our knowledge about the small size of the suckling pig and that it is usually the whole animal that is being roasted and not just an unspecified portion of its meat. These examples show that the oddity of derived uses in cases where there exists a lexicalised alternative disappears under the right contextual circumstances, and thus suggests that the blocking phenomenon may be pragmatic in nature. In other words, the 'blocking' phenomenon does not seem to provide a very strong argument in favour of a rule-based account of count-mass polysemy.

In their discussion of examples such as (33)-(35), Copestake & Briscoe (1995: 39) suggest that uses of a derived form in cases where there exists a lexicalised alternative are possible because the choice of a less common or interpretable form from among different ways of expressing the same meaning "carries the (discourse) implication that the terms are not strictly synonymous". The hearer may therefore infer that some additional meaning is intended; in (33), as we saw, that the interdiction concerns the animal as a whole and not just its meat, due to its status in the Hindu religion. This latter use is clearly more informative than the alternative utterance containing beef, which would not (at least not as easily) give access to this information. I agree with Copestake & Briscoe insofar as it seems likely that the interpretive system is sensitive to the frequency of use of (quasi-)synonymous forms such as cow/beef, pig/pork and so on, and so the use of a derived form instead of a more frequent lexicalised one may be interpreted as implicating some additional meaning. But such effects do not have to be due to a semantic restriction on the use of a derived form in cases where there exists a parallel lexicalised form. As far as I can tell, there is not much in Copestake & Briscoe's explanation to support a semantic restriction view either. While they argue that the blocking phenomenon is semantic in nature, their explanation for it seems to be a mainly pragmatic one.

2.4   The availability of 'default' senses

Finally, advocates of rule-based approaches to count-mass polysemy argue that lexical rules are required to explain the availability of 'default' interpretations in uninformative contexts (Asher 2011, Copestake & Briscoe 1992, 1995, Pustejovsky 1995). For instance, the most accessible interpretation of (36) below might be the one in which rabbit picks out 'rabbit meat' (and thus that 'Sam enjoyed but later regretted *eating* the rabbit').

(36)   Sam enjoyed but later regretted *the rabbit*.[19]

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19 Example due to Copestake & Briscoe (1995: 42).

Within computational semantic accounts, constructions of this kind are typically treated as being interpreted by means of a generative rule of 'coercion' (Asher 2011, Asher & Lascarides 2003, Pustejovsky 1991, 1995; see also Zarcone 2014 for a recent development of this account). They involve a verb that subcategorises for an NP or VP syntactically, but which semantically requires a complement of the type 'event'. In cases where this type requirement is not satisfied by the surface syntactic structure, a coercion operator changes the semantic type of the NP into an event, consistent with information stored as part of the the lexical representation of the noun (so-called *qualia* information, cf. Pustejovsky 1991, 1995). In this way, the semantic processing of (36) would involve the selection of an appropriate aspect of the lexically specified meaning of the complement (in this case its *telic role*: 'rabbit meat is for eating'). The idea is that this explains the default character of the eating interpretation and goes against a pragmatic analysis: "[T]he *meat-grinding* sense of *rabbit* provides a telic role which allows the eating interpretation to be constructed. However, if the lexicon does not propose such a sense, it is unclear what it is about the context which allows pragmatic specialization of the interpretation" (Copestake & Briscoe 1995: 42, see also Asher 2011: 93 for a similar argument).

The claim that the availability of 'default' interpretations in uninformative contexts is evidence of a linguistically-mandated process appears to underestimate the hearer's use of background knowledge in the interpretation process: a lack of linguistic context does not mean that the utterance is necessarily understood in a vacuum. Arguably, there are hardly any entirely context-free interpretations. Cognitive pragmatic theories of utterance interpretation such as Relevance Theory (Carston 2002, Sperber & Wilson 1986/1995, Wilson & Sperber 2004, 2012) emphasise that utterances are understood against a set of contextual assumptions — a subset of the hearer's assumptions about the world — which may include assumptions activated by or derived from observation of the physical environment, encyclopaedic knowledge, memories and beliefs as well as the preceding linguistic context (Sperber & Wilson 1986/1995: 15). When the assumptions that may be derived from the linguistic and extra-linguistic context are scarce, as in (36) above, the hearer will have to rely more on information stored in his long-term memory in interpreting the utterance. Assuming that lexically encoded concepts are points of access to an ordered array of encyclopaedic knowledge (e.g., Wilson & Carston 2006; see Section 3 for more detail on this issue), the linguistic meaning of (36) would activate information about the concept RABBIT, among which assumptions along the lines of RABBITS ARE MEAT, RABBIT MEAT IS DELICIOUS TO EAT may be highly accessible. These assumptions, combined with assumptions that the other concepts encoded by the sentence may give access to (for instance that EATING DELICIOUS FOOD IS AN ENJOYABLE ACTIVITY, which might be activated by the concept ENJOY), may lead to the eating interpretation becoming more accessible than any of the other

possible interpretations and could be what gives it a 'default' character. In this way, its availability can also be explained in pragmatic terms. Notice also how real-world knowledge would exclude an eating interpretation of (37) in an 'out of the blue' context and instead render another interpretation accessible:

(37)   Sam enjoyed but later regretted *the hamster*.

In the absence of any further contextual specification, the most accessible interpretation might be one in which *the hamster* refers to the animal, and that Sam enjoyed having it as a pet but later regretted this. This interpretation becomes available through activation of encyclopaedic knowledge about hamsters (e.g., HAMSTERS ARE PROTOTYPICAL PETS, THEY HAVE SOFT CUDDLY FUR, etc.). Advocates of the rule-based account could of course argue that the lexical representation for *hamster* includes this information (e.g., by its *telic role* specifying that the purpose of these animals is to be held as pets, or something along these lines) and therefore makes available a different 'default' interpretation in this case. However, they would also have to explain why there is arguably no particular 'default' interpretation arising from an 'out of the blue' utterance of (38):

(38)   Sam enjoyed but later regretted *the mouse*.[20]

Specifically, we need to know what it is about the lexical representation of *mouse* that makes it unclear what interpretation it would have without any further contextual specification. Of course, proponents of the rule-based account could argue that mouse does not have a telic role that could serve as input to the compositional process and therefore no default interpretation is computed in (38). And similar ad hoc explanations could be given for any 'out of the blue' context where the type coercion process fails to generate a clear default interpretation. However, an alternative explanation might be that such 'out of the blue' utterances are only felicitous when they give access to enough conceptual (encyclopaedic) knowledge to be interpreted — in other words, when the hearer's (arguably non-linguistic) background assumptions are sufficient to suggest a likely interpretation — in which case an explanation based on lexical semantics only seems untenable.

It is also questionable whether the 'default' character of the eating interpretation in (36) is properly explained on the rule-based account proposed by Copestake & Briscoe, where there would be (at least) three possible interpretations of *rabbit* made available by the lexicon: the general ground sense ('rabbit stuff'), the meat-grinding sense ('rabbit meat') and the fur-grinding sense ('rabbit fur'). Why is the meat-grinding sense selected and not any of its other rule-generated senses? To explain this, Copestake & Briscoe suggest that lexical entries may include representations of

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20 I thank an anonymous reviewer for this example.

the attested lexical rules which have applied to them, and that these are associated with a probability. So in the lexical entry for *rabbit*, the meat-grinding rule should have a higher probability than the other rules, leading to the meat interpretation being generated by default and providing the input to the coercion mechanism. However, if frequency of use determines the probability of a sense, it is not impossible that the 'unground' sense might have an equal probability in (36), given that the NP *the rabbit* is unspecified with respect to its syntactic count/mass properties, but it does not seem like a good candidate for a 'default' interpretation.[21] Again, a simpler explanation for the interpretive preference would be one which the hearer is activating his background or other contextual knowledge to disambiguate between these interpretive possibilities (or where only the most accessible one is activated), and where information about sense frequency plays a role but is not the only determining factor.

2.5 Wrapping up: Lexical rules are not necessary

I hope to have shown so far that none of the standard arguments given for a rule-based account of count-mass polysemy provides decisive grounds for claiming the existence of lexical rules, and that each of them can be countered by a plausible pragmatic explanation. Furthermore, I have argued that count-mass polysemy is more pragmatics-driven than is usually acknowledged by rule-based theories, which allow for little flexibility of interpretation. If lexical rules are defeasible (which I think they must be, given the range of context-dependent interpretations that the count-mass alternation may give rise to), it remains for rule-based theories to explain what makes them necessary, if we already have defeasibility as part of our pragmatic system.

Finally, as I touched on above, there is the problem of overgeneration, which is inevitably associated with rule-based theories. For instance, on Copestake & Briscoe's (1995) account, utterances such as *Rabbit is expensive*, *Mary loves moose*, *Reindeer is hard to come by these days* would, given the UNIVERSAL GRINDER, the rules of MEAT GRINDING and FUR GRINDING, be three-ways ambiguous (and there may be other rules applying as well). If pragmatic considerations play a role in deciding that one rule has prevalence over the others in a given context, which indeed seems likely, it leaves us again with the question of what role the lexical

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21 This is of course an empirical question. Whether language users are in fact as unanimous with respect to the 'default' interpretations they assign in out-of-the-blue contexts as rule-based accounts presuppose, would be an interesting topic for experimental investigation. In a recent study of the interpretation of pre-nominal possessives (e.g., *John's knife*) in English speaking adults, Kolkmann (2016) found that 'default' interpretations were considerably less principled than might be predicted on the basis of lexical-semantic rules.

rules are playing in the interpretation process. If lexical pragmatics is required to handle the most context-dependent cases of count-mass polysemy, as well as cases of overgeneration, it seems likely that the same pragmatic mechanism would also be capable of handling that part of the interpretive work done adequately by the lexical rules. The question, then, is whether anything is to be gained by deriving some interpretations in one way (via lexical rules) and others in a distinct way (via pragmatics). At least, considerations of theoretical economy (cf. Occam's razor) would favour an account with only one mechanism (combined with an account of the fact that some senses or interpretations are more common or accessible than others) over one in which there are two parallel mechanisms.

Taken together, I think the points raised in this section make an alternative, lexical pragmatic approach worth considering. While it has been claimed that pragmatics cannot handle cases of systematic polysemy (e.g., Copestake & Briscoe 1995, Rabagliati et al. 2011) or instances of 'default' interpretations more generally (Asher 2011) (see Section 2.4 for more detail on this issue), there have not, to the best of my knowledge, been any systematic attempts to provide a pragmatic explanation of this data. The final part of this paper is devoted to an outline of a lexical pragmatic account of count-mass polysemy.

3   Count-mass polysemy as pragmatics

In English (and in other languages containing this feature), nouns are linguistically marked as either count or mass by the presence or absence of determiners or plural morphemes. As discussed in Section 2.1, this provided a key argument for advocates of a rule-based analysis of count-mass polysemy. A pragmatic account must answer the following questions: What does count-mass syntax contribute to the interpretation process? How does it interact with the pragmatic system? In the next subsection, I present a brief overview of some of the main theoretical and psychological issues that have been raised in connection with the count-mass distinction. Based on this, I suggest an approach to the distinction that will underlie the pragmatic account of count-mass polysemy that will follow in section 3.2.

3.1   The lexical semantics of count-mass polysemy

The count-mass distinction has attracted a lot of attention among linguists, philosophers and psychologists due to the fundamental issues it raises for the relation between grammar, conceptual representation and the physical world. A widespread view of the nature of the count-mass distinction is that it is an inherent property of nouns themselves, which are specified as either count or mass in the lexicon (e.g., Chierchia 1998, Gillon 1992, 1999, Quirk et al. 1985 and many others). Such

lexicalist approaches take count and mass features to provide selection restrictions on determiners, accounting for the morpho-syntactic characteristics of the distinction, for instance, that count but not mass expressions can be pluralized, appear with the indefinite article (e.g., *a car*, *cars*) and quantifiers such as *several* and *few* (e.g., *several/few cars*), while mass expressions appear with quantifiers such as *much* and *little* (*much/little water*). A challenge for this view is the existence of 'double-life' nouns, which sometimes occur as count nouns, sometimes as mass nouns (e.g., *rock*, *rope*, *love*, *fantasy*, etc.), and which are equally natural in both uses (Ware 1975). Furthermore, as illustrated in Section 2, it seems that most nouns, if not all, can be used as both count nouns and mass nouns with an adjustment in meaning (*We had much sun last week*, *That's a lot of shopping centre for a small town*,[22] *Two waters, please!*, etc.). In order to account for this flexibility, some theorists appeal to 'conversion' rules that transform count nouns into mass nouns and vice versa (e.g., Gillon 1992, 1999). It seems that it is this kind of approach that implicitly underlies most rule-based approaches to count-mass polysemy: If a noun is syntactically marked as either count or mass, the function of the lexical rule would be to change the value of the feature, thereby generating a default sense.

It has been argued against lexicalist approaches that if any noun can be either count or mass, it is unclear what syntactic work the count and mass features actually do, when no constructions will be ruled out (Borer 2005, Pelletier 2012, Pelletier & Schubert 2003). Thus, another line of approach takes count and mass to be properties not of lexical items but of functional structures (Allan 1980, Borer 2005, Bunt 1985, Pelletier 2012, Ware 1975). On this view, it is NPs, not nouns as such, that are the bearers of count and mass properties. One version of this *structuralist* approach is Pelletier (2012). He takes nouns to have comprehensive denotations, containing *all* the semantic values of which they are true (e.g., *cake* is true of both some individuals and some stuff). Combining a noun with a determiner to form an NP involves adding one of the syntactic features 'count' or 'mass' to the NP, the semantic effect of which is to 'delete' either the count or mass part of the meaning of the noun. Another version is Borer's (2005) account, on which all noun denotations are mass but where mass is seen not as an inherent property but as arising from 'default' interpretations in the absence of count structure. These structuralist approaches are promising in that they account well for the existence of 'double-life' nouns as well as the flexibility that most nouns exhibit with respect to their ability to occur as both count and mass nouns, with corresponding shifts in meaning.

A second, big issue is the relation between the syntactic count-mass distinction and the conceptual representations it maps onto. Quine (1960) famously argued that the syntactic count-mass distinction corresponded to a culturally constructed

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22 Example due to Nunberg & Zaenen (1992).

ontological distinction between objects (individuals) and substances (stuff), and that count-mass syntax was the means by which children learn to discriminate the two. Against this position, there is now much empirical evidence that the conceptual distinction between count and mass is universal and robustly present in language-independent systems prior to the acquisition of count-mass syntax in languages that have it (Barner & Snedeker 2006, Bloom 1994, 1999, Imai & Gentner 1997, Papafragou 2005, Soja 1992, Soja et al. 1991), and so acquiring the syntactic distinction presupposes rather than gives rise to such basic ontological categories. Several psychologists have suggested that count-mass syntax corresponds to a conceptual distinction between the kinds of entities we *perceive* as individuals (where the notion of individual corresponds approximately to 'discrete bounded entity'), and those we *perceive* as non-individuated entities. This approach, referred to as *the cognitive individuation hypothesis*, proposes that a speaker's use of a count or mass expression to refer to some aspect of reality depends on her interpretation of the referent as an individual or as a non-individuated entity (Bloom 1996, Langacker 1987b, Mufwene 1984, Wierzbicka 1988, Wisniewski 2010). This then leads the hearer to *construe* the entity referred to as individuated or non-individuated, respectively. This hypothesis has received support in a number of experimental studies (e.g., Bloom 1994, 1999, Bloom & Kelemen 1995, McPherson 1991, Middleton et al. 2004, Wisniewski et al. 1996, 2003). However, its advocates also acknowledge that even if there is much evidence that the count-mass distinction is to a large degree conceptually based, there are exceptions. One example is the conventional mass use of *toast* in English to refer to individuals.[23] Another may be 'mass' superordinate expressions such as *furniture*, which appear to have individuals in their denotations, and where the experimental results are conflicting: some studies suggest that *furniture* nouns are typically interpreted as picking out individuals (Bale & Barner 2009, Barner & Snedeker 2005); others indicate that subjects construe referents of count superordinates (e.g., *vehicles*) differently from those of mass superordinates such as *furniture*, the former being interpreted as referring to one or more distinct entities, the latter to a non-individuated group of objects united by spatial and/or functional contiguity (Wisniewski et al. 1996). The status of the *furniture* cases remains a topic of debate in the literature (for an analysis that recognises both the 'non-individuated' and 'constituent objects' facets of the entities in their denotations, treating them both as so-called functional aggregates, see Grimm 2012). However, the conflicting experimental results regarding their interpretation suggest that people's intuitions about the count and mass properties of their denotations may diverge, possibly as a result

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23 For instance, as Paul Bloom (cited by Wisniewski 2010: 185) has commented, "I have no doubt that I think of a piece of toast as a singular individual, but — due to a quirk of English — I have to talk about it using the word 'toast', a mass noun. So I ask you 'Do you want more toast?' while thinking of a singular entity.".

of linguistic knowledge and real-world knowledge influencing people's judgements in different ways in these particular cases.

In this paper I adopt the following view on the count-mass distinction. First, concerning its syntactic characteristics, I take a structuralist approach along with Pelletier (2012), Borer (2005) and others, and assume that count and mass are properties not of individual nouns but of NPs, and consequently that there is no syntactic difference between 'count nouns' and 'mass nouns'. I take it that nouns are syntactically unspecified with respect to their count and mass properties, and that this is determined by the syntactic structure into which they are inserted (or in some cases by the wider context, as when they are combined with the determiner *the*, which creates NPs which are syntactically unspecified with regard to their count-mass properties). This position will have important consequences for the pragmatic account of count-mass polysemy that I will propose in the next section.

Second, I broadly subscribe to the cognitive individuation hypothesis, assuming that a speaker's *use* of count or mass syntax in an NP reflects her interpretation of the entity described by the head noun as either an individual or a non-individuated entity, which in turn would lead the hearer to construe this entity in the one way or in the other (constrained, to some extent, by the real-world properties of denotations, cf. the *furniture* cases discussed above). However, unlike what is assumed by the cognitive individuation hypothesis, I see this as taking place at the level of NPs, not individual nouns. In this way, count-mass syntax can be seen as encoding a *procedure* (cf. Blakemore 1987, Wilson 2011), which guides the hearer in the inferential process of utterance comprehension by imposing a constraint on the entity referred to by use of the NP in question (i.e. as one that is individuated or non-individuated respectively).

Moreover, assuming that our ability to distinguish conceptually between individuated and non-individuated entities does not rely on count-mass syntax, our strong intuitions about the count or mass properties of many concepts may arise from mentally stored encyclopaedic (or real-world) knowledge about the entities they pick out, including both prototypical and imagistic representations. That we typically take concepts such as CAT and SAND to pick out individuated and non-individuated entities respectively, is grounded in our real-life experiences with these entities. Of course, our count-mass judgements may also be influenced by the 'default' or most frequent uses of nouns (e.g., that *cat* typically occurs with count syntax and *sand* with mass syntax) but the primary source of these judgements is taken to be conceptual rather than linguistic. We 'see' cats out in the world as bounded countable individuals and sand as an unbounded entity. Thus, in many cases, the conceptual count-mass distinction has a perceptual-experiential basis (McPherson 1991). In other cases, however, there may be no such count-mass relevant information stored, or what is stored may be compatible with the entities in the denotation having either property. Examples are abstract terms (e.g., *love*, *hope*, *anger*), 'double-life' nouns

(e.g., *rock*, *rope*, *stone*), some plurals (e.g., *blues*, *wares*, *clothes*), and the *furniture* cases, where our intuitions about their count or mass properties may diverge, and where one construal might have become conventional in one language (e.g., the English mass usage *furniture*) and another construal in other languages (e.g. French *meubles*, Norwegian *møbler*).

Finally, the syntactic distinction that language users make use of is not a direct or perfect reflection of the conceptual distinction. Sometimes the real-world properties of an entity allow for more than one possible conceptualisation (e.g., *many leaves/much foliage*, *furniture/meubles*, cf. Grimm 2012). In other cases we may have to do with an idiosyncratic linguistic convention (e.g., *toast*). However, in the majority of cases the speaker's choice of count or mass syntax is indicative of how she conceptualises the entity referred to.

In the next section, I will outline a pragmatic account of count-mass polysemy, which rests on the assumptions about the count-mass distinction I make above. My account is framed within Relevance Theory (Carston 2002, Sperber & Wilson 1986/1995, Wilson & Sperber 2004, 2012), whose assumptions concerning verbal communication are well suited to tackle the interpretive flexibility involved in count-mass polysemy. However, the gist of the account should also be available to other approaches in which context (broadly construed) and pragmatic inference play a crucial role for the outcome of lexical interpretation. My main proposal is that although count-mass syntax provides the hearer with an important clue to the interpretation intended by the speaker, it is but one of many sources of information that the hearer draws on in the pragmatic inferential process of deriving speaker-intended lexical meanings. The aim will be to show that pragmatics, often aided by syntactic clues, has a constructive role to play in the interpretation of count-mass polysemy.

3.2   The lexical pragmatics of count-mass polysemy

First some theoretical preliminaries. The relevance-theoretic approach to pragmatics is a fundamentally cognitive account of utterance interpretation. The central claim about human information processing is that it "tends to be geared to the maximization of relevance" (*The Cognitive Principle of Relevance*; Sperber & Wilson 1986/1995: 260). Relevance is defined as a potential property of inputs to cognitive processes, and may be assessed in terms of the amount of effort (of perception, memory and inference) it takes to process the input, and the 'positive cognitive effects' the individual may derive from it, where a positive cognitive effect involves a warranted strengthening, revision or elimination of a previously held assumption, or the derivation of a contextual implication (Wilson & Sperber 2004: 608). Other things being equal, the more cognitive effects an input yields to an individual and

the less effort it takes to process it, the higher the degree of relevance of that input to the individual at that time (ibid. 609).

Another central assumption of Relevance Theory is that ostensive stimuli in the form of utterances create in the addressee a presumption that they are optimally relevant (*The Communicative Principle of Relevance*; Sperber & Wilson 1986/1995: 260). An utterance is optimally relevant if (a) it is at least relevant enough to be worth processing, that is, it is more relevant than other inputs that the hearer could have been attending to at the time, and (b) it is the most relevant one compatible with the speaker's abilities and preferences, taking into account that the speaker might be unable or unwilling to make her utterance more informative or economical given the circumstances (ibid. 270). To make her utterance optimally relevant, the speaker should achieve at least enough cognitive effects to make the utterance worth processing and avoid causing the hearer any gratuitous effort in achieving those effects. The hearer's goal in communication is to find an interpretation of the speaker's meaning that meets the expectations of relevance raised by the ostensive stimulus itself.[24]

To illustrate, consider the following example. On 27 January 1967, the command module of the *Apollo 1* spacecraft was destroyed by a fire during a test and training exercise, killing the three astronauts aboard. When one of the control centre employees called up another NASA colleague to tell him about the incident, he uttered (39):

(39)   We *lost* our crew![25]

Given the ambiguity of the utterance (and more specifically of the verb *lose*), the colleague at the receiving end was at first unsure whether he was being told that the crew were simply missing — that they had been unable to find them and so couldn't carry out the testing — or if he was in fact telling him that they had all died. But when his colleague continued, in an agitated voice, "There has been a fire!", he understood his intention to communicate the latter. Although the contextual information was still compatible with the first interpretation, that (a) they couldn't locate the crew and (b) there had been a fire, the hearer inferred, taking the agitation in the speaker's voice into account, the causal-explanatory connection between the first and the second utterance. According to Relevance Theory, he arrived at this interpretation by following a comprehension heuristic that is applied automatically to verbal input (Wilson & Sperber 2004: 613), by which the hearer (a) follows a path of least

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24 For a review of experimental evidence testing the Cognitive and Communicative Principles of Relevance, see Van der Henst & Sperber (2004). For experiments testing other key tenets of Relevance Theory, including the presumption of optimal relevance, see Van der Henst et al. (2002a,b) and Noveck & Sperber (2007).

25 Attested example from the documentary *In the Shadow of the Moon* (2007) directed by David Sington.

effort in considering interpretive hypotheses, and (b) stops when the interpretation he arrives at satisfies his expectations of relevance. Given the available contextual assumptions in (39), including the speaker's agitated behaviour, the interpretation that the hearer's three colleagues had been killed was more relevant than the other interpretation being not only highly accessible in the circumstances but also carrying a huge range of contextual implications concerning the consequences for the crew's families, future Apollo missions, and so on.

In the relevance-theoretic framework, the distinction between linguistic semantics and pragmatics is seen as corresponding to different processes involved in utterance comprehension: (i) decoding of the linguistic material into a 'logical form', and (ii) pragmatic inference. A logical form — the semantic output of linguistic processing — is seen as a structured set of concepts: a highly underspecified, not fully propositional 'template' or 'schema' for a range of possible propositions, which contain slots that have to be filled — a process that requires pragmatic inference (Carston 2002). There is thus quite a specific division of labour between semantics and pragmatics, where pragmatic inference is seen as required for the hearer to arrive at a fully propositional (i.e. truth-evaluable), communicated meaning (for examples and discussion of other ways of drawing the semantics-pragmatics distinction, see McNally 2013 and Stojanovic 2014).

In its view on concepts, Relevance Theory takes the Fodorian critique of decompositional (specifically, definitional) accounts of lexical meaning to be decisive (Fodor 1981, 1998), and the most plausible alternative to be a simple mapping from lexical form to mental concept.[26] For instance, the lexical form *lion* is seen as encoding the mental concept LION, which would be a constituent of the logical form resulting from the linguistic processing of an utterance containing the the lexical form *lion*. Such stable mental concepts stand in referential relations to things the world. For instance, the concept LION stands for the property that all and only lions have ('lionhood') (Wilson & Sperber 2002). Further, a mentally repre-

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26 There is a big debate in philosophy and cognitive science regarding the nature of concepts: Are they definitional, partly definitional, prototypes, atomic or something else? Each position is associated with its own set of advantages and shortcomings (see Laurence & Margolis 1999 for a review, and Margolis & Laurence 2015 for recent perspectives). While I adopt the relevance-theoretic (Fodorian) position here, according to which there is a simple mapping between words and (atomic) mental concepts, this is not crucial to the overall argument presented in the paper (for relevance-theoretic accounts discussing whether pragmatically derived (ad hoc) concepts are plausibly atomic or decompositional, see Allott & Textor (2012) and Hall (2017). There is also an on-going debate within Relevance Theory regarding the nature of word meaning: one proposal is that substantive words (nouns, verbs, adjectives) do not encode full-fledged concepts but more schematic representations (Carston 2012, 2013). Another is that they encode polysemy complexes, consisting of sets of conventional senses (Carston 2016, forthcoming). Although my account of the pragmatics of count-mass polysemy is based on the orthodox relevance-theoretic position according to which most words encode full-fledged concepts, it should also be compatible with these recent theoretical developments.

sented concept is seen as an address in memory that may give access to different kinds of information, including: (i) *lexical* information connected with the linguistic form that encodes the concept (i.e. its phonological and syntactic properties), and (ii) *encyclopaedic* information associated with the entity that the concept stands in a referential relation to, that is, a set of conceptually represented assumptions and beliefs, including stereotypes and culture-specific information, and also, in many cases, imagistic and/or sensory-perceptual representations (Sperber & Wilson 1986/1995: 86). The idea that concepts are associated with encyclopaedic entries is broadly equivalent to the notion of *mental files* recently introduced in philosophy and experimental psychology (Fodor 2008, Recanati 2012, Perner et al. 2015).[27] For instance, an encyclopaedic entry (or mental file) associated with the concept LION might plausibly include some of the following assumptions about the entity it picks out, which may be used in inferences involving the concept:

(40)   *Encyclopaedic entry* for LION:
     a.   IS A LARGE CAT
     b.   IS TAWNY-COLOURED
     c.   LIVES IN AFRICA
     d.   IS A SKILLED HUNTER
     e.   IS IS VERY STRONG
     f.   IS COURAGEOUS
     g.   IS PERSEVERING
     h.   LOOKS LIKE THIS: [mental image]
     i.   . . . etc.

Relevance Theory sees lexical interpretation as typically involving the construction of occasion-specific *ad hoc concepts*, which may be narrower or broader than the linguistically encoded concepts (Carston 2002, 2010, Wilson & Carston 2006, 2007, Wilson & Sperber 2012). Lexical broadening and narrowing involve taking the encoded concept and its associated encyclopaedic information, together with a set of contextual assumptions, as input to the inferential process of constructing hypotheses about the speaker-intended meaning on the basis of expectations of relevance. As an illustration, consider the metaphorical use of *lion* in (5), repeated below as (41) for convenience.

(41)   Peter will no doubt make it to the top. He's a *lion*.

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27 It also has an affinity with the notions of *conceptual domain* in cognitive linguistic approaches (e.g., Langacker 1987a) and *vector spaces* in distributional semantic approaches (e.g., Clark 2015). Notice, however, that encyclopaedic entries themselves are not part of the encoded meaning of words, but merely associated with them.

The linguistically encoded meaning of the word *lion*, (let's say) the concept LION, will provide access to stored encyclopaedic information about its instances. Suppose that the most contextually salient referent for *Peter* is the speaker's colleague, who is manifestly not a lion in any literal sense but is known to be a passionate mountain climber, and who has just told his colleagues about a climbing trip in the Himalayas that he's planning to take during the summer. This contextual information might provide the hearer with certain expectations about how the utterance in (41) should achieve relevance to him. The encyclopaedic assumptions associated with the concept LION that are likely to be added to the context in interpreting (41) would be those that can be applied equally to humans, and which contribute to the relevance of the interpretation (i.e. achieve enough implications, at a low enough processing cost). In this case, accessible encyclopaedic assumptions might be that LIONS ARE VERY STRONG, COURAGEOUS, PERSEVERING, etc. So on the basis of these the hearer would broaden the concept encoded by *lion* to an ad hoc concept LION*[28] (paraphrasable as 'very strong, courageous, persevering, etc.'), which picks out actual lions as well as those humans who possess these properties, and allows the speaker to draw further implications, for instance about Peter being likely to push his limits and take risks when climbing mountains, about the sort of climbing trip that Peter is planning, and so on (see Wilson & Carston 2006 for further examples).

Another example of lexical broadening would be the hyperbolic use of *boiling* in (4) above, repeated here as (42) for convenience, to refer to an uncomfortably high temperature (cf. Wilson & Carston 2007):

(42)   I think it's best to let the baby sleep in his room. It's *boiling* outside.

Here, the communicated ad hoc concept BOILING* is broader than the encoded concept, picking out not only substances that are literally boiling but other items that can be classified as uncomfortably hot. The hearer would arrive at this broadened concept by adding to the context encyclopaedic assumptions made accessible by the concepts BOILING and OUTSIDE (e.g., TOO HOT TO FEEL COMFORTABLE), in combination with the contextual information that babies should not be exposed to very high temperatures, to satisfy his occasion-specific expectations of relevance.

The outcome of the process of ad hoc concept construction may also be a concept that is narrower than the one linguistically encoded. This would be the case in (1) and (2) above, repeated here as (43) and (44):

(43)   Mary was hungry and *opened* the grapefruit.

(44)   Jane had a difficult first year at university. She didn't get enough *units* to continue.

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28 By convention, ad hoc concepts are marked with an asterisk.

The concept encoded by the verb *open* is very general — it may involve a range of different activities (e.g., open a book, a dishwasher, a bottle of wine, a pair of curtains, one's mouth, a conference, a word document, etc.) — and on most occasions of use is has to undergo some form of contextual specification.[29] On the relevance-theoretic account, the occasion-specific sense in (43) results from the construction of an ad hoc concept which is more specific than the general concept encoded by *open*. This process of conceptual narrowing would involve adding to the context encyclopaedic information made accessible by the concept OPEN (both stereotypical and more specific ways of opening), together with information activated by the concept GRAPEFRUIT (e.g., GRAPEFRUIT IS A FRUIT, HAS A THICK SKIN, A SWEET EDIBLE MEAT INSIDE, etc.), warranting the construction of the ad hoc concept OPEN* (paraphrasable as 'peeled off the skin').[30] A similar account can be given of the interpretation of *units* in (44), although here the hearer may have to rely more on assumptions made available by the wider discourse context (in particular, encyclopaedic information associated with the concept UNIVERSITY) in order to arrive at the speaker-intended, narrowed down ad hoc concept UNITS* (paraphrasable as 'university credit modules'). The key point here is that on the pragmatic account the ad hoc-concepts in (41)-(44) are all derived as a result of the operation of a single lexical pragmatic process, which fine-tunes the communicated meanings of words in different directions (either as broader or narrower than the linguistically-encoded concepts) in line with the hearer's situation-specific expectations of relevance.

Returning now to count-mass polysemy, my proposal in this paper is that even these apparently systematic sense alternations arise mainly due to the same sort of lexical pragmatic process that yields the occasion-specific senses in (41)-(44). This process — of ad hoc concept construction — is also responsible for the interpretive flexibility observed in count-mass polysemy (cf. Section 2). Consider the use of the NP *the rabbit* below.

(45)   John came home from the restaurant with a stomach ache. He blamed it on *the rabbit*.

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29 It may be that some instances of opening simply remain underspecified, even at the level of communicated thought. Carston (2012: 614) discusses this possibility on the basis of examples such as *Whenever I open anything I feel anxious* or *Everyone opens things sometimes*, which appear to involve the communication of very broad and underspecified OPEN concepts. But, as she points out, even these general concepts seem to be narrower (e.g., by being confined to the opening of concrete objects capable of being physically opened) than the supposedly linguistically-encoded concept OPEN, which also applies to a range of more abstract forms of opening (e.g., conferences, lectures, accounts, etc.).

30 That is, if this level of specificity is required to satisfy the hearer's context-specific expectations of relevance.

The unspecificity of nouns with respect to their syntactic count-mass properties entails that every noun is potentially polysemous between an individuated (object) conceptualisation and a non-individuated (stuff) conceptualisation, constrained to some extent by the real-world properties of the entity it describes.[31] The second part of the utterance in (45) is likely to achieve relevance for the hearer by offering an explanation as to why John ended up with a stomach ache. The NP *the rabbit* is linguistically unspecified with regard to its count or mass properties. But as the hearer would be looking for a particular kind of implication (the reason for John's stomach ache), he may, as a result of accessing encyclopaedic information associated with the concepts RESTAURANT (e.g., RESTAURANTS SERVE FOOD TO CUSTOMERS, etc.) and RABBIT (e.g., RABBITS ARE MEAT, RABBIT MEAT IS SERVED AT RESTAURANTS, RABBIT MEAT IS DELICIOUS TO EAT), construe the concept communicated by the NP as referring to a non-individuated (food) entity, and further narrow it down to the ad hoc concept RABBIT* (paraphrasable as 'rabbit meat'). This, together with other contextual assumptions (e.g., IF SOMETHING IS DELICIOUS TO EAT ONE OFTEN HAS TOO MUCH OF IT, HAVING TOO MUCH TO EAT MAY LEAD TO A STOMACH ACHE, etc.), would warrant an implication that satisfies his context-specific expectation of relevance (e.g., JOHN ATE TOO MUCH RABBIT* AT THE RESTAURANT AND AS A RESULT HE ENDED UP WITH A STOMACH ACHE).[32]

In the example above, the syntactic information provided by the NP was not sufficient to specify whether it was to be conceptualised as count or mass, and pragmatics had a constructive role to play in determining its contextual interpretation. The example also serves to illustrate how the alternation between these possible conceptualisations is not isomorphic to the syntactic count-mass distinction. However, in the canonical cases of count-mass polysemy, the count or mass conceptualisation *is* linguistically specified by a noun's occurrence in a count or mass NP. How does this linguistic component interact with the pragmatic system in the construction of ad hoc concepts? Consider the examples of systematic polysemy in (46) and (47).

(46) a. *Three dogs* ran across my lawn today.
      b. In China, I tried *dog* for the first time.

(47) a. The plants need *some water*.

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31 And so whether or how often this polysemy potential is actually realised will vary depending on the noun.

32 This is of course only one of several interpretive possibilities for (45). Another might be that the rabbit (food) was bad or too heavy, and that this is what caused John's stomach ache, which would be based on the activation of a set of other encyclopaedic assumptions such as (RABBITS ARE MEAT, MEAT SPOILS, EATING SPOILED MEAT CAUSES STOMACH ILLNESS, etc.). This interpretive flexibility can be accommodated on the pragmatic account.

b.   [To waiter]: Can we have two hamburgers and *a water* to share, please?

First let's consider the prototypical uses. In (46a), the noun *dog* is used in a count NP to refer to a set of individual dogs, and in (47a), the noun *water* is used in a mass NP to refer to a non-individuated entity of water. On the present account, count-mass syntax would in both cases provide the hearer with a procedural instruction to construct a concept that picks out entities that are either individuated (46a) or non-individuated (46b). The output of the linguistic processing of the NPs, (let's say) DOG{individuated} and WATER{non-individuated}, both correspond closely to representations of prototypical exemplars likely to be highly activated as part of the encyclopaedic information associated with the concepts, and would allow for easy retrieval of the speaker-intended interpretations (which, depending on the context of utterance, may require some further specification).

Second, in the less prototypical use in (46b), where *dog* occurs in an NP with mass syntax, the output of linguistic processing, (let's say) the concept DOG{non-individuated}, includes a procedural instruction to the pragmatic system that the concept to be constructed picks out non-individuated entities. Based on encyclopaedic assumptions made available by the concept DOG and the other concepts activated by the utterance (e.g., DOG MEAT IS CONSUMED IN CHINA) the hearer may construct the ad hoc concept DOG* (paraphrasable as 'dog meat'), which would be narrower than the output resulting from the linguistic processing of the NP (specifying any kind of non-individuated entity that can be classified as DOG).

Similarly, in (47b), where *water* occurs with count syntax in the NP *a water*, the output of linguistic processing would be the concept WATER, combined with an instruction to construe this concept as picking out individuated entities, let's say WATER{individuated}. The pragmatic system would then construct a narrower ad hoc concept on the basis of this procedural instruction, highly activated encyclopaedic information associated with the concept itself (e.g., WATER IS DRUNK FROM CONTAINERS), and other contextual assumptions derivable from the utterance situation, say, from the fact that the speaker and hearer are at a restaurant where guests are served bottles of water. The communicated concept, WATER* (paraphrasable as 'bottle of water'), would be narrower than the linguistically-specified concept, picking out a subset of the set of individual entities of water. A similar analysis could be given for the communicated senses of water in the count NPs below, each of which would express a different ad hoc concept (WATER**, WATER***, WATER****), differing in the direction that the process of narrowing takes, and the degree of specificity involved:

(48)   "Right now most of my friends drink a lot of soda and they don't drink as much water so I gave them that challenge of substituting one soda for *one water* a day and they really liked it."[33] ('drink of water')

(49)   [From a discussion of plant care]: "I keep the room in the 70's, how often should I water them? I give them both *one water* a day when I wake up."[34] ('portion of water')

(50)   "The diagonal line (e) through the hatched areas indicates redox conditions for *a series of waters* sampled from a brackish, stagnant pond in an industrialized area in Scandinavia (...)".[35] ('samples of water')

It may be that in some cases the expectations of relevance raised in a particular context are such that the output of pragmatic processing would be a concept that is less specific than the ones outlined in (47)-(50) above. For instance, if the speaker had just requested *a water* (and not one *to share*) in (47b), the WATER concept she intended to communicate would have been specified as individuated but could remain unspecific with regard to its 'portioning' (the waiter's interpretation of *a water* as communicating 'any suitable serving of water' might be relevant enough in that context). Such nuances in interpretation are difficult to capture on a rule-based account, where the change in the denotation of the noun would result from a default linguistic operation. However, a weaker version of the rule-based account could claim that the lexical rules are not required to capture this sort of interpretive specificity. For instance, we could imagine a lexical rule that creates count denotations out of mass denotations and vice versa, without specifying what exactly the countable entity (or mass) is, except that is somehow related to whatever sort of thing the source noun denotes (McNally, personal communication). While this is a possiblity, it is not clear what role such a general lexical rule would play in the interpretation process, if, in most cases, some pragmatic specification or narrowing would be required anyway in order to recover the truth-conditional content of the speaker's utterance.[36] For instance, in the example of *a water* in (47b) above, although the concept communicated might be unspecific with regard to its relevant 'portioning',

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33 http://foodal.com/knowledge/paleo/easy-health-lifestyle-changes/

34 https://www.420magazine.com/forums/indoor-soil-cultivation/243242-seedlings-growth-slowed-down-sludge-advice.html

35 http://cool.conservation-us.org/jaic/articles/jaic31-03-007_2.html

36 Another possibility might be to claim that, in some cases, what looks like a change in the interpretation of the noun is rather that the output of the composition process is such that it simply appears that a change in the nominal interpretation has taken place (McNally, personal communication). While I agree that this might be a possible approach to some cases of systematic polysemy (perhaps particularly relevant to the 'dot-object' kind, e.g., *This book has an interesting plot and an eye-catching cover*), I think it is unlikely to work for count-mass polysemy where the sense alternations are typically truth-conditionally significant.

its denotation would have to be restricted to water that's drinkable, clean, cold enough, etc., so some pragmatic narrowing would arguably still be required. Had the waiter returned with a glass of dirty water he could not be said to have understood what the speaker intended to order. Moreover, it is not clear what would trigger the operation of such a lexical rule in a given context. If it is the structure of the NP (say, the presence or absence of determiners), the rule would arguably be redundant, since the count or mass relevant information is already provided by the construction itself. And if the trigger is supposed to be some conceptual representation(s) activated by the utterance or the wider discourse context, this would make the rule difficult to distinguish from a lexical pragmatic process.

There are several advantages to a pragmatic account of count-mass polysemy compared with a standard rule-based account. First, it provides the interpretive flexibility that is missing in rule-based accounts. For instance, all of the examples in (51)-(56) (repeated from (24)-(29) above) could be analysed as cases where linguistic information provided at the level of NPs specifies the count or mass properties of the concepts to be constructed, combined with a process of ad hoc concept construction on the basis of the encoded concept, associated encyclopaedic knowledge, contextual assumptions and situation-specific expectations of relevance:

(51)   Will a hamster bite if it smells *cat* on my hands? ('particles')[37]

(52)   [Biology teacher]: Now take a look at these samples. *Rabbit* should be easy to recognize. ('faeces')

(53)   In the old days, *birch* was used to heal wounds. ('bark')

(54)   *Pine* is antiseptic for the respiratory tract and it treats pneumonia, asthma, and other respiratory ailments.

(55)   Jane was offered *three wines* at the tasting. ('varietals')

(56)   [Before going home from work, the aquarium employees go through their usual closing routine, which includes checking that the pools have the correct water levels]: Employee A: Have you gone through everything? Employee B: I just need to check *the waters*, then I'm done. ('levels of water')

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37 Consider also similar non-individuated uses of *cat* in the following passage from an article entitled "Cat Allergy" written by a medical doctor on his blog (http://www.changingspots.net): "By far the most effective way to avoid cats is to get rid of them, but even that isn't 100 percent. If you removed your cat today, it would take six months for the level of *cat* in your home to reach minimal levels, since cat allergen degrades slowly over time. Fortunately, *cat* may be removed more quickly by using a damp mop, and wet vacuum carpet cleaner."

For instance, assuming that the CAT concept construed as a result of the linguistic processing of (51) could be used to refer to any non-individuated entity that would count as 'cat stuff', the communicated ad hoc concept CAT*, picking out the particular sort of cat stuff that remains on one's hands after petting a cat, would be formed through pragmatic narrowing, taking encyclopaedic assumptions activated by the concept CAT (e.g. PETTING A CAT MAY LEAVE CAT PARTICLES ON ONE'S HANDS, CAT PARTICLES MAY BE DETECTED BY OTHER ANIMALS, etc.) as input to the inferential process. Similarly, the concept communicated by the NP *the waters* in (56) would be arrived at via pragmatic narrowing of the concept WATER (constrained to picking out individual entities of water), which on the basis of encyclopaedic information activated by this concept and contextual assumptions activated by the utterance situation (e.g., A DAILY TASK OF THE ACQUARIUM EMPLOYEE IS TO CHECK THE WATER LEVELS IN THE DIFFERENT POOLS), would enable the construction of the ad hoc concept WATER***** ('levels of water'). While rule-based accounts may also appeal to pragmatics to explain these cases, there would, on the pragmatic account proposed here, in principle be no interpretive difference between (51)-(56) on the one hand, and the standard 'systematic' cases in (46) and (47) above, on the other, although some may require more pragmatic processing than others. Thus, unlike rule-based accounts, it gives a unified account of the data. Consider also the pair in (57).

(57) a. John is preparing *turkey*.
   b. John is preparing *a turkey*.

On the present account, the meat senses of *turkey* in (57) would both be derived as a result of pragmatic adjustment (narrowing) of the linguistically-specified concept, the main difference being that the count-mass syntax would lead the hearer to construct a concept with a non-individuated reference in (57a) and a concept with an individuated reference in (57b), which may give rise to different contextual implications. For instance, in (57b), an implication might be that it is the whole animal that is being roasted, not an individual portion of its meat (though this might be an accessible interpretation in a different context, e.g., 'John ordered *a turkey* and Mary ordered *a pasta*'). On standard rule-based accounts, the meat sense in (57a) would be derived via a rule of meat-grinding, but the meat sense in (57b) would have to be derived via some pragmatic mechanism that is capable of adjusting the individuated denotation of the noun. This interpretive asymmetry is of course possible, but it would be theoretically more parsimonious with a single pragmatic mechanism that can yield the appropriate senses for both. Given this, I think it remains for advocates of rule-based accounts to explain what makes the rules

necessary, and what is to be gained by deriving some interpretations in one way (via lexical rules) and others in a distinct way (via pragmatics).

Finally, overgeneration should be less of a problem on the pragmatic account, where only interpretations that are consistent with the hearer's expectations of relevance will be computed (i.e. those that achieve enough implications, at a low enough processing cost). Recall that on the rule-based account, an utterance such as *Rabbit is expensive these days* would, given the universal grinder and the rules of animal meat-grinding and animal fur-grinding, be three-ways ambiguous and it is not clear how hearers determine when one rule has prevalence over the others. This ambiguity does arguably not arise on the pragmatic account, where the appropriate interpretation of the noun is arrived at through consideration of information from several sources — linguistic, encyclopaedic, situation-specific — and on this basis, guided by expectations of relevance, the hearer forms a hypothesis about the speaker-intended meaning.

4   Discussion: The rule-based arguments revisited

The main proposal of this paper has been that cases of count-mass polysemy allow for more interpretive flexibility than is acknowledged by existing accounts. For this reason, I have argued that the phenomenon should be explained mainly by reference to the workings of the pragmatic system, which can accommodate the flexibility observed. While one might see the abandonment of lexical rules as sacrificing predictive power (in favour of descriptive accuracy), the view underlying the account presented in this paper is that specific interpretive predictions can only be made on a case-by-case basis, taking the wider context and situation-specific expectations of relevance into account. The general prediction, however, is that interpretations are derived in accordance with hearers' situation-specific expectations of relevance. At the same time, the fact remains that count-mass polysemy appears systematic and productive to some important extent, and postulating lexical rules is one way to capture this fact. In this final section, I discuss how this can be reflected on the pragmatic account that I have just outlined. This includes a re-consideration of the standard arguments underlying rule-based accounts of count-mass polysemy discussed in Section 2.

4.1   The contribution of the linguistic component

In the pragmatic account that I have proposed, count-mass syntax plays an important role in the hearer's derivation of speaker-intended senses, and in giving rise to the 'systematic' patterns of polysemy observed. More specifically, the proposal was that count-mass syntax, being a property of NPs rather than of individual nouns,

encodes a procedure which guides the hearer in the inferential process of utterance comprehension, by imposing a constraint on the entity referred to by use of the NP — individuated vs. non-individuated, respectively — which in turn has consequences for possible outcomes of the conceptual narrowing (or broadening) process. In this way, our linguistic knowledge about the count-mass distinction being paired reliably with a distinction between individuated and non-individuated denotations (though there may be exceptions, see the discussion in Section 3.1) may give rise to a sense of systematicity. But, as I have argued, count-mass syntax is but one of many sources of information that the hearer draws on in the pragmatic inferential process of constructing hypotheses about speaker-intended meanings. Moreover, rather than indicating a restricted set of linguistically stored sense alternations, the syntactic count-mass distinction is seen as paving the way for lexical pragmatic creativity by providing the basis for a variety of context-dependent interpretations, as illustrated by examples such as *Move over and give me some more bench* or *The extra bulk on her stomach is baby, not food*. On the pragmatic account, there would be no principled difference between creative cases such as these and the more 'systematic' cases discussed in this paper as concerns the linguistic evidence provided for their interpretations, though some would require more pragmatic work than others.

4.2 Pragmatic systematicity?

Nevertheless, there is no doubt considerable interpretive systematicity involved in the standard cases of count-mass polysemy, which reliably target nouns whose referents belong to a specific category and can be extended productively to new members of that category. But if it does not stem from the existence of productive lexical rules, as I have argued throughout this paper, what is the source of this sense of systematicity? If we have to do with some sort of 'pragmatic systematicity', where does it come from?

First, whether or not one supports a pragmatic approach it seems quite uncontroversial that the sense relations involved in the standard cases of count-mass polysemy (e.g., animal-meat, tree-wood, food-portion, etc.) reflect highly regular and predictable associations between states of affairs in the real world (cf. Fodor & Lepore 2002) — this would be so even if they could be shown to be part of our linguistic system. In Section 2.2 above, I suggested that the frequency with which we are exposed to such real-world regularities in our daily lives and the inferences we continuously draw on their basis, might cause representations of them to become immediately activated when one of their constituent concepts is accessed. This is something that language users might exploit in communication, and could be partly responsible for the sense of systematicity that we observe in count-mass polysemy. For instance, if accessing an animal concept causes the relation between the animal

and its meat to become immediately available (e.g., accessing the concept TURKEY immediately activates the encyclopaedic assumption that TURKEYS ARE MEAT), this should also make the meat sense highly accessible whenever the animal noun occurs with mass syntax in the appropriate context. However, the relation might be activated independently of whether the noun occurs with count or mass syntax (cf. examples (45) and (57) above). If representations of such relations are already highly accessible bits of general world knowledge, their inclusion as part of the grammar seems redundant. From a relevance-theoretic point of view, such immediately activated bits of encyclopaedic knowledge might be useful in utterance comprehension, by contributing to cognitive efficiency and saving hearers' overall processing effort. That we typically find an alternation between 'animal' and 'meat' senses of animal nouns, but not so frequently between 'animal' and 'dwelling' (cf. Murphy 1997), could be due to considerations of relevance. Knowing that something is meat is generally highly relevant given our lifestyles, and this knowledge might be immediately activated upon processing an animal noun, making the meat-interpretation easily accessible to the hearer. However, activating knowledge about an animal's dwelling may require some additional contextual information.[38]

Second, particular senses may stabilise or become conventional (a process also termed *fossilisation* by some authors) as a result of frequency of use (Geis & Zwicky 1971, Traugott & Dasher 2002, Blutner 2007, 2010). According to historical linguists, the main driving force in semantic change is pragmatics; it is motivated by speaker-hearer interactions and communicative strategies (Traugott & Dasher 2002, Eckardt 2006). What may start out as an ad hoc concept may become stabilised or conventional over time for individual speakers or within a language community as a result of frequent adjustment of the lexical meaning of a word in a specific direction (Wilson & Carston 2007). In such a case, the inferential process of constructing an ad hoc concept may become progressively more automatised and attain the status of a 'pragmatic routine' (Vega-Moreno 2007), whose presence would also give rise to a sense of interpretive systematicity. Such automated pragmatic inferences would increase the accessibility of certain interpretations, thereby saving hearers' overall processing effort. However, having a pragmatic basis, they will be suppressed if there is strong contextual information making another interpretation more accessible (and relevant).

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38 One example may be a discussion of what types of animals live in the speaker's garden, where she could point to a certain type of dropping and say 'That's *deer*', a hole in the flower bed and say 'That's *rabbit*', a heap of earth on the lawn and say 'That's *mole*', etc., and the intended 'dwelling' interpretations would be highly accessible to the hearer. (I thank Deirdre Wilson for the example.) The example also illustrates the close affinity between systematic polysemy and metonymy, as observed by many authors (see e.g., Apresjan 1974 and Dölling forthcoming).

Frequent activation of pragmatic routines in lexical interpretation might lead to further stabilisation of the ad hoc concepts derived, and finally, in some cases, they come to be reanalysed as part of the conventional meaning associated with the lexical item (Traugott & Dasher 2002, Eckardt 2006). An example of such a semantic change may be the mass occurrence of the noun *chicken*, whose meat-sense seems conventional to the extent that it may have acquired a conceptual address of its own, and give access to its own set of encyclopaedic assumptions.[39] In other words, the relation between the animal and the meat senses of this expression may have developed into one of ambiguity rather than sense extension. On the present account, the claim would be that this reanalysis has taken place as a result of frequent pragmatic narrowing of the general mass sense of *chicken* in a specific direction. This pragmatic account of the systematicity (and possible semantic change that may result from it) of count-mass polysemy gives a fuller picture than standard rule-based accounts by integrating a synchronic and a diachronic perspective on the phenomenon.

4.3 Pragmatic blocking?

Consider now the so-called blocking phenomenon, described by rule-based accounts as cases where the existence of lexicalised forms (e.g., *veal*, *beef*, *wood* and so on) 'blocks' rule application. One way to address these cases on the current pragmatic account is by reference to the notion of optimal relevance (Sperber & Wilson 1986/1995: 270), discussed in Section 3.2 above. A speaker aiming at optimal relevance should try to achieve enough cognitive effects to make her utterance worth processing, and avoid causing the hearer any unjustifiable or gratuitous effort in achieving those effects. As a consequence, the extra effort demanded by any indirectness in an utterance should be offset by extra (or different) effects, which would not have been achieved by use of a more direct utterance. On this approach, the use of a non-lexicalised form (e.g., *cow*) in cases where there exists a lexicalised alternative (e.g., *beef*) which speakers would conventionally use to refer to the entity in question, should result in the derivation of extra (or different) cognitive effects (or else explained away as a lapse on the part of the speaker). In other words, the reason why examples such as ?*John likes to eat cow* or ?*This chair is made out of tree* sound odd is that, without a more specific context, the extra processing effort they require of the hearer is not offset by any extra (or different) cognitive effects that he may derive from them. But, as I discussed in Section 2.3 above, a more informative context might make the same use acceptable, for instance by yielding

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39 In this case Carston's (2016) recent proposal that substantive words encode 'polsemy complexes' is highly relevant.

different cognitive effects than would a use of the corresponding conventional form as in (58) (repeated from (34) above):

(58)   Overall, households that display trees made out of plastic now outnumber households that display trees made out of *tree*. (?*wood*)

Similarly, in an example such as *Hindus are forbidden to eat cow* (cf. (33) above) there is sufficient contextual information to license the use of the derived form *cow* instead of the more conventional, lexicalised form *beef*. Although this use might demand an extra (but possibly relatively minor) effort of processing, it allows the hearer to draw implications about the status of the cow in Hindu religion, which would not have been achieved as easily by use of the alternative utterance containing the lexicalised form. In this way, the phenomenon could be more appropriately described as a form of 'pragmatic blocking' rather than blocking in the sense of a linguistic constraint (see also Clark & Clark 1979 on this issue).

4.4   The availability of 'default' senses reconsidered

Finally, I discussed in Section 2.4 above how the existence of clear interpretive tendencies in uninformative contexts — so-called 'default' interpretations — has been taken to provide a strong argument against the possibility of a pragmatic analysis. For instance, Asher (2011: 93) writes, "[p]ragmatic approaches . . . fail to say anything relevant about . . . cases of coercion . . . in out of the blue contexts". However, as I also argued in this section, this claim considerably underestimates the fact that hearers rarely come to the interpretation process 'empty-handed'; utterances are not understood in a vacuum. On the relevance-theoretic pragmatic account proposed here, a crucial task for the hearer in utterance comprehension is to choose a set of contextual assumptions against which the utterance is to be understood; this also happens when the utterance occurs in an 'out of the blue' context. At the same time, there is not much doubt that advocates of rule-based approaches are right in claiming that certain interpretations come more readily to mind than others in uninformative contexts. As we have seen, an utterance of *Sam enjoyed the rabbit* would probably most often be interpreted as 'Sam enjoyed eating the rabbit-meat' in the absence of any specific contextual constraints. But the 'default' character of this interpretation could, rather than arising from the operation of a lexical rule, stem from immediately activated real-world knowledge activated by the concept RABBIT (e.g., RABBITS ARE MEAT, RABBIT MEAT IS DELICIOUS TO EAT, and so on). The processing of this utterance in an 'out of the blue' context could then be seen as an instance of hearers favouring the least effort-consuming conceivable interpretation (Sperber & Wilson 1986/1995: 185). Also, a person eating rabbit may be regarded as a stereotypical event (at least in certain parts of the world) which could be stored

in encyclopaedic memory as a chunk and accessed as a single unit of information. Retrieving this information from encyclopaedic memory during the interpretation of the utterance would require little processing effort, whereas deriving an interpretation according to which Sam enjoyed, e.g., wearing the rabbit-fur, or playing with rabbit-the-animal, would involve accessing several units of information and hence be more costly in processing terms. In this way, the pragmatic approach proposed here can provide an account of why certain interpretations are often favoured over others without being committed to the view that these are wholly linguistically generated by default (see also Kolaiti & Wilson 2014). It also predicts that 'default' interpretations of the same utterance may diverge between hearers (Kolkmann 2016), as a result of individual differences in the type or organisation of encyclopaedic knowledge associated with concepts.

5 Conclusion

This paper has argued that the interpretive flexibility that is observed in lexical interpretation quite generally (cf. the examples in (1)-(5) and references cited there) also applies to many cases of count-mass polysemy. Therefore, it is argued, the linguistic component provided by count-mass syntax should be analysed as leaving a more underspecified semantic output than is usually acknowledged by rule-based theories, and the alternations in meaning as arising from the application of pragmatic processes at the level of individual words.

I hope to have shown that rule-based accounts leave much work for the pragmatic system to do in finding the interpretation that was intended by the speaker on a given occasion. This involves both handling the most context-dependent cases of alternation between count and mass senses of a noun, and overriding 'default' interpretations in contexts where another 'non-default' interpretation was clearly intended. I have argued that if there is a single pragmatic mechanism that is able to do this work, it should also be able to do the part of the interpretive work that rule-based accounts do adequately. Treating count-mass syntax as a procedural constraint on NP referents, I have proposed the lexical pragmatic process of ad hoc concept construction, developed within the relevance-theoretic framework, as a promising candidate for this task.

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