A Pragmatic Account of ‘Logical Metonymy’

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Abstract
This paper discusses the computational linguistic account of ‘logical metonymy’ (Susan began the book, Mary enjoyed the movie) in which these constructions are analyzed as being interpreted by means of a lexicon-internal generative mechanism operating over information-rich lexical entries. It points out several empirical and theoretical problems with the theory, which it claims make it ultimately unworkable. The paper then suggests an alternative, pragmatic account of the logical metonymy phenomenon, where its interpretation is governed primarily by the operation of pragmatic inferential processes. It is argued that this provides a more explanatory, psychologically plausible account that is capable of avoiding the problems associated with the computational linguistic account.

Keywords: logical metonymy; computational linguistics; generative lexicon; inferential pragmatics; processing.

Introduction
Computational linguistic accounts have influentially argued that ‘logical metonymy’ of the kind in (1) is interpreted by means of a lexicon-internal generative mechanism that forces a non-conventional reading of the complement (Copestake & Briscoe, 1996; Lascarides & Copestake, 1998; Pustejovsky, 1995). 1

(1) Susan began a book.

Constructions of this kind are seen as involving a verb that subcategorizes for an NP or a progressive VP syntactically, but which semantically requires a complement with an eventive interpretation. In cases where this requirement is not satisfied by the surface syntactic structure, as in (1) above, a coercion mechanism changes the denotation of the NP from an entity into an event consistent with eventive information stored as part of the lexical representation of the noun.

This type of approach was originally proposed by Pustejovsky (1991, 1995), whose main aim was to provide a more explanatory account of ‘logical polysemy’ (words with two or several “overlapping, dependent or shared meanings” (Pustejovsky, 1995: 28)) than a mere listing of senses in the lexicon. A more promising approach, he argued, which captures how word senses may partially overlap and be logically related to one another, is a lexicon where items are decomposed into information-rich templates, combined with a generative framework for the composition of lexical meanings. In Pustejovsky’s generative lexicon theory (GLT) nouns encode so-called qualia structures, which specify four different aspects of meaning: (i) the constitutive role captures the distinction between an object and its constitutive parts; (ii) the formal role specifies what distinguishes the object within a larger domain; (iii) the telic role defines the purpose or function of the object; and (iv) the agentive role describes the factors involved in the origin or ‘bringing about’ of an object.

\[
\text{book} \quad \begin{align*}
\text{ARGSTR} &= \text{x:information} \\
\text{ARG2} &= \text{y:phys_obj}
\end{align*}
\]

\[
\text{QUALIA} = \begin{align*}
\text{information.phys_obj_lcp} \\
\text{FORMAL: hold(y,x)} \\
\text{TELIC: read(c,w,x,y)} \\
\text{AGENTIVE: write (e’,v,x,y)}
\end{align*}
\]

Figure 1: Qualia structure for the lexical concept book, as presented in Pustejovsky (1995: 101). 2

For logical metonymies such as (1), Pustejovsky posits a single lexical entry for the verb (instead of assuming that it is represented as different lexical entries, one for each syntactic complement type it may select for) which specifies that its internal argument must be of the type Event. The interpretation of the VP arises from a generative mechanism called ‘type coercion’, which is a “semantic operation that converts an argument to the type that is expected by a function, where it would otherwise result in a type error” (ibid. 111). In this way, the semantic processing of the VP in (1) involves the selection of appropriate event information encoded in the qualia structure of the noun (in this case its telic role: books are for reading (by humans)), which yields the interpretation ‘Susan began reading a book’.

An advantage of the generative lexicon theory is that it accounts for clear interpretive tendencies for logical metonymies in uninformative contexts, e.g., that the preferred or ‘default’ interpretation of (1) in the absence of any further contextual cues would be that ‘Susan began

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1 These constructions are referred to as a form of ‘logical metonymy’ because the ‘logical’ structure of the verb forces an interpretation upon the NP complement in which part of an event (a book in (1)) is used to ‘stand for’ the event as a whole (‘reading a book’).

2 Pustejovsky treats the noun book as an instance of a ‘lexical conceptual paradigm’, or ‘dotted type’, in which its physical object sense, its information sense as well as the combination of the two are encoded.
reading a book’ (and not that she, e.g., began ripping it up). In fact, the availability of such ‘default’ interpretations is often taken as evidence of a linguistic-semantic process; the claim is that if the lexicon does not propose such a sense (by providing a telic role in the lexical entry for the noun that allows for the compositional interpretation to be generated), it is unclear how it can arise since it is not otherwise indicated by the context.

Notwithstanding its intuitive appeal, there are several problems associated with this approach, as pointed out by a number of scholars (Asher, 2011; Blutner, 2002; de Almeida, 2004; de Almeida & Dwivedi, 2008; Fodor & Lepore, 2002). In what follows, I discuss some of these problems and suggest an alternative, pragmatic account of logical metonymy. I argue that a pragmatic approach is more explanatory and psychologically plausible and avoids the problems associated with GLT-based accounts.

Problems with GLT-Based Accounts

A common criticism of Pustejovsky’s (1995) computational account of logical metonymy is that it lacks a distinction between linguistic knowledge and general world knowledge. For instance, there seem to be many cases in which a verb makes a demand on a complement that the lexical entry for that argument does not satisfy. Consider the utterances in (2) and (3):

(2) Peter enjoyed the nice weather.
(3) Karen enjoyed the children.

If the intended interpretations of (2) and (3) are that ‘Peter enjoyed being outside in the nice weather’ and ‘Karen enjoyed playing with the children’, it is difficult to see how they could be generated as there would arguably be no telic roles stored in the lexical representations for the nouns weather and children for the type coercion mechanism to take as input to the compositional process. So either one has to assume that in these cases the interpretations are derived entirely by pragmatic means, by contrast with, for instance, Karen enjoyed the book, which, if the intended interpretation is that ‘Karen enjoyed reading the book’, would be linguistically generated by the type coercion operator on the basis of the telic role for the lexical concept book. Or, one could assume that there is in fact some eventive information stored as part of the lexical entries for weather and children that allows for the interpretations above to be generated. Indeed, there seems to be nothing in the theory that prevents this possibility, which opens up for a range of ad hoc solutions to the many cases in which a qualia structure is difficult to define for a lexical item. Moreover, if this route is taken, the lexical entries posited by the theory would seem to contain a considerable amount of information that is more likely to belong to the conceptual system than to the level of linguistic representation, and there would appear to be no way of constraining the amount of world knowledge entering into the lexical representation of a given lexical item.

A related criticism can be provided against the claim that the availability of ‘default’ interpretations in uninformative contexts is evidence of a linguistic-semantic process. It appears that this claim considerably underestimates the fact that hearers rarely come to the interpretation process ‘empty-handed’, as it were; utterances are not understood in a vacuum. Arguably there are hardly any context-free interpretations. This point is worth emphasizing since the existence of such clear interpretive tendencies is often seen as providing a prime motivation for a linguistic, lexicon-based analysis of logical metonymy and 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 the cases of coercion like John enjoyed his glass of wine or Mary enjoyed her cigarette in out of the blue contexts”. However, pragmatic theories of utterance comprehension emphasize that 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 (Sperber & Wilson, 1986/1995; Wilson & Sperber, 2004); this also goes for the interpretation of utterances in ‘out of the blue contexts’. This set of assumptions – a subset of the hearer’s assumptions about the world – may include assumptions derived from the observation of the physical environment, encyclopedic knowledge, memories and beliefs as well as the preceding context. When the assumptions that the hearer may derive from the linguistic and extra-linguistic context are scarce, he may rely more on information stored in his long-term memory in his interpretation of the utterance. Given this, it is possible that interpretive preferences observed for logical metonymies in the absence of further context could stem from highly accessible real-world knowledge about the denotations of the lexical concepts in the utterance, and not from lexically stored information. At least it seems clear that in its generation of compositional interpretations the type coercion mechanism posited by the GLT makes heavy use of information that might just as well count as general world knowledge, and no justification seems to be given for why certain information is considered linguistic knowledge while other types of information would be considered part of our general world knowledge.

It has also has also been held against the GLT that it cannot avoid making wrong predictions about many compositional interpretations. For instance, it predicts that the VPs begin the car and begin the thermometer should be interpreted as ‘begin driving the car’ and ‘begin measuring the temperature’, due to the telic roles that would be associated with the complement nouns (cars are for driving; thermometers are for measuring temperatures) (Fodor & Lepore, 2002). It is unclear what would prevent such interpretations from being constructed as ‘default’ on the computational account.

A related problem that has been pointed out in connection with a GLT-based account of logical metonymy is that, by modeling the processing of such constructions entirely in terms of a lexicon-internal process, it is unable to account
for its inherently flexible nature. For instance, while its true that the tendency to interpret the VP begin a book as ‘begin reading a book’ holds when the VP is considered in isolation (in a ‘null’ context) a more specific context may easily point the hearer toward a different interpretation. Consider the utterance in (4) below, being interpreted in the following context:

Context: Mary, John and Sue work as book conservators at the British Museum. They are working on restoring a collection of medieval books, all of which are in a poor condition after having been stored on the shelves for many years. Since they are completely covered in dust, each book has to be carefully dusted before being rebound. One day, after hours of hard work, John asks if they should all take a break and go for coffee. Sue has just finished her pile of books and is ready to follow John to the coffee bar in the Great Court when Mary utters:

(4) [Mary]: Hang on a minute! I’ve just begun a huge old book.

The most accessible interpretation of the last part of Mary’s utterance above is clearly that she has begun dusting a huge old book, not reading it, as would be the default interpretation predicted by the GLT, and which would have to be computed and then overridden by context in this case. It does not take much imagination to think of other contexts in which the correct (i.e. speaker-intended and easily retrieved) interpretation of the VP begin a book would be ‘begin binding a book’, ‘begin designing a book’, ‘begin mending a book’, ‘begin ripping up a book’, and so on. The problem for the GLT is that it is unable to predict such interpretive flexibility (which would involve taking speaker intentions into account), even if the predictions it makes are in many cases correct. Furthermore, the treatment of compositional interpretations generated by the linguistic system as being defeasible, which would be required by examples such as (4), raises the question as to whether we want our semantics to include defeasibility when we have already got it as part of our pragmatic system. At least, some justification has to be given for why we could not just leave this to pragmatics, using information from the immediate context as well as general world knowledge to construct speaker-intended interpretations.

A final theoretical consideration is the significant amount of work that the computational linguistic account leaves for the pragmatic interpretive system to do, in overriding default interpretations in the absence of linguistic cues and correcting the wrong interpretations generated by the system. In principle, a pragmatic theory that can serve this purpose should also be capable of handling that part of the interpretive work that the computational linguistic account does adequately (see Zegarac, 2006 for a similar argument). In the next section, I give the outlines of such a pragmatic account.

A Pragmatic Account

My proposal for a pragmatic account of logical metonymy is grounded within the relevance-theoretic approach to pragmatics (Carston, 2002; Sperber & Wilson, 1986/1995; Wilson & Sperber, 2004), which is fundamentally a cognitive account of utterance interpretation. Sperber and Wilson’s (1986/1995: 260) central claim about human information processing is stated in their Cognitive Principle of Relevance: “Human cognition tends to be geared to the maximization of relevance”. Relevance is defined as a potential property of all types of input to cognitive processes, and may be assessed in terms of the amount of effort it takes to process the input, and the ‘positive cognitive effects’ the individual may derive from it (where a positive cognitive effect is described as a ‘worthwhile difference to the individual’s representation of the world’). 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 that individual at that time.

Sperber and Wilson (1986/1995) further claim that ostensive stimuli in the form of utterances create expectations of relevance not raised by other types of stimuli, which are precise and predictable enough to guide the hearer toward the communicator’s meaning. This is stated in their Communicative Principle of Relevance: “Every act of ostensive communication communicates a presumption of its own optimal relevance” (ibid. 260). By requesting the addressee’s attention, the communicator conveys that her ostensive act is more relevant than alternative stimuli competing for his attention at the time. An utterance is optimally relevant if (a) it is at least relevant enough to be worth processing and (b) it is the most relevant one compatible with the speaker’s abilities and preferences (ibid. 270). To make her utterance optimally relevant, the speaker should achieve at least enough cognitive effects to make the utterance worth processing while avoiding 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.

In this framework, the distinction between linguistic semantics and pragmatics is seen as corresponding to different processes involved in utterance comprehension: linguistic decoding of the utterance into a ‘logical form’ (a ‘template’ or ‘schema’ for a range of possible propositions), and pragmatic inference, which develops the logical form into a full proposition (Carston, 2002; Sperber & Wilson, 1986/1995; Wilson & Sperber, 1993).3

On this pragmatic account, the speaker-intended event associated with the VP in instances of logical metonymy

3 This is, of course, a kind of abstraction since in actual on-line processing the decoded words/morphemes are delivered rapidly to the pragmatic processing system (which does not ‘wait’ to get the logical form as a whole).
(e.g. ‘begin reading a book’) would be derived entirely by means of a pragmatic process. Either the interpretation of these constructions could be analyzed as instances of ‘free’ enrichment (e.g., Carston, 2002; Recanati, 2002), where a constituent not expressed in the linguistic form of the utterance is supplied in forming a hypothesis about the proposition that the speaker intended to communicate. Or, as de Almeida and Dwivedi (2008) suggest, the pragmatic derivation of speaker-intended meanings for logical metonymies could be analyzed as being structurally driven, that is, as a form of saturation (or linguistically mandated completion). On this approach, which I tend to favor due to the mandatory character of this process, the syntactic structure of sentences such as Susan began a book could be seen as containing an extra VP with an empty verbal head, as shown by (5) (de Almeida & Dwivedi, 2008: 316):

(5) Susan began [vp [\sqrt{e} [np a book]]

The verbal gap that remains in the logical form of such constructions would have to be filled in (saturated) using information from the discourse context. The process itself would be linguistically mandated and consist in supplying a missing constituent to the proposition expressed, but the relevant event associated with the VP would be supplied entirely on pragmatic grounds. Returning to the example in (4), where the intended interpretation of the last part of Mary’s utterance is that she ‘just began dusting a huge old book’, this would be the most relevant interpretation that the hearer could derive. It would be the one that requires the least processing effort as well as the one that is relevant in the expected way (by offering an adequate explanation for the content of Mary’s previous utterance of ‘Hang on a minute!’). At no stage in the interpretation process, therefore, is it assumed that a ‘default’ interpretation is computed and then cancelled by context.

Now consider again the VPs begin the car and begin the thermometer, for which the computational linguistic account makes wrong interpretive predictions (‘begin driving the car’, ‘begin measuring the temperature’). The pragmatic account proposed here would, of course, come with no such interpretive predictions, but it would equally require that an event be supplied when the VPs are embedded within an utterance in a context. Consider the context of a garage where Bill is employed as a mechanic. In this context, it is easy to imagine the most relevant interpretation of an utterance of Bill began the car being that ‘Bill began repairing the car’ (that is, the least effort demanding interpretation which yields the expected sort of cognitive effect(s)). However, a speaker using the VP begin a car to describe a situation in which someone began driving a car would (in most cases, at least) not be optimally relevant, as the choice to use this expression rather than the more conventional start the car would, in most circumstances, due to the extra effort of processing it would induce, send the hearer off searching for additional effects, which would not be part of the speaker’s intended meaning.

However, there is not much doubt that computational linguists are right in claiming that certain interpretations come more readily to mind than others in uniformative contexts. Returning to the example in (1), it is true that it would probably most often be interpreted as meaning that ‘Susan began reading a book’ in the absence of any real-life contextual constraints. As I have already mentioned, the ‘default’ character of this interpretation could, rather than arising from the operation of a linguistic-semantic process, stem from highly accessible real-world knowledge about books, activated by the decoding of the lexical concept BOOK. In the processing of this utterance in an ‘out of the blue’ context, this could be seen as an instance of hearers favoring the least effort-consuming conceivable interpretation. A person reading a book may be regarded as a stereotypical event, which may be stored in encyclopedic memory as a chunk and accessed as a single unit of information. Retrieving this information from encyclopedic memory during the interpretation of (1) would require little processing effort, whereas deriving an interpretation according to which she began, e.g., dusting, designing, mending, or ripping up a book would involve accessing several units of information and hence be more costly in processing terms. In this way, it is possible to provide an account of why certain interpretations are often favored over others without being committed to the view that these are always computed first as a result of default inferences associated with lexical items.

A crucial difference between the relevance-theoretic pragmatic analysis of logical metonymy and computational linguistic accounts is the status of the information used to derive compositional interpretations; whether it is seen as being encoded as part of the semantics of the VP or merely contingent, stored as part of the hearer’s encyclopedic knowledge and made accessible by the decoding of the lexical concepts in the utterance. As I see it, a clear advantage of the latter analysis is that, instead of postulating default interpretations that can be overridden in the case of explicit contextual evidence pointing to a different (‘non-default’) interpretation, it allows for, in fact predicts, the necessary flexibility in lexical interpretation (which is constrained, however, by the hearer’s expectation of relevance).5

5 Within the cognitive linguistic framework, logical metonymy has been discussed by Langacker (1984, 2000) as a so-called ‘active-zone phenomenon’, in which “[t]hose portions of an entity which participate most directly in a relationship ... constitute its active zone with respect to that relationship” (2000: 62). In a logical metonymy such as I started my dissertation – planning it, that is –, Langacker’s claim is that the event of planning constitutes the active zone of my dissertation with respect to start. Words, in this theory, are thought to provide a point of access to the entire knowledge inventory associated with a particular lexical concept, and the active zone can be seen as that part of this knowledge which is relevant or active within a particular utterance on a given

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4 Either way, however, the recovery of the specific activity associated with the VP would be a matter for context and pragmatic inference.
Recently, Asher (2011; Asher & Pustejovsky, 2006) has proposed a formal account of word meaning and semantic composition that builds on the central ideas of the GLT as developed by Pustejovsky (1995) and others, but which, unlike the GLT, is capable of integrating context dependence at the discourse level. In short, in Asher’s ‘type composition logic’ each word stem is assigned a type. Predicates place type presuppositions on their arguments, which their arguments must satisfy, or at least be compatible with, if the predication is to be semantically well-formed. Logical metonymy is analyzed as an instance of coercion, or a type conflict, where there is an adjustment in predication due to the justification of a type presupposition (for instance, the internal argument type presupposition for enjoy is of the type EVENT). Unlike the GLT, however, the coercion mechanism in Asher’s framework is more flexible in that it is able to make use of arguments other than the internal argument of the licensing verb, as well as of world knowledge and discourse information, in specifying the relevant event associated with it. However, the account retains the idea in GLT of default interpretations of logical metonymies being generated by the linguistic system by postulating defeasible ‘type specification rules’, which predict, for instance, that if the subject of the construction Susan enjoyed the book is specified as HUMAN, and we, by coercion, derive the interpretation that Susan enjoyed an event associated with the book, that event is by default one of reading the book (similarly, if the subject is specified as AUTHOR this event would by default be one of writing the book). Such default readings can be overridden if there’s another reading made salient by the context.

Psycholinguistic Studies of Logical Metonymy

The different predictions made by computational linguistic accounts and the pragmatic account I have proposed in this paper have, to some extent, been subject to psycholinguistic experimental testing. Recently there has been a string of publications investigating the processing of logical metonymy, addressing the issue of whether it involves the application of lexicon-internal generative mechanisms to a semantically complex lexical entry or the operation of a general pragmatic-inferential process to atomic concepts. Several studies have been taken to provide support for so-called ‘type-shifting effects’, that is, an extra processing lead hypothesized to result from the operation of a type coercion mechanism (McElree, Frisson, & Pickering, 2006; McElree, et al., 2001; Pickering, McElree, & Traxler, 2005; Traxler, Pickering, & McElree, 2002). For instance, using a self-paced reading experiment, McElree et al. (2001) found that logical metonymy (e.g., The secretary began the memo before the annual sales conference) induced longer reading times, hence were associated with greater processing complexity, compared to preferred constructions (e.g., The secretary typed the memo before the annual sales conference) and non-preferred constructions (e.g., The secretary read the memo before the annual sales conference). Others, however, are more skeptical (de Almeida, 2004; de Almeida & Dwivedi, 2008) about the existence of such effects. For instance, McElree et al.’s result was not replicated by de Almeida (2004), who, in two self-paced reading experiments did not obtain any ‘type shifting effects’ in cases where no context was provided before the sentence and where the sentences where embedded in contexts that specified the nature of the activity performed over the complement VP. In a recent survey of empirical studies of the processing of logical metonymy, de Almeida and Dwivedi (2008) argue that the empirical results favoring the existence of a type coercion mechanism are at best weak, and that even if there exist such ‘coercion’ effects, there are other possible explanations for them (for instance, they could result from verbal gaps in the logical form of such constructions which require contextual saturation, as suggested above). As this shows, the available experimental evidence is far from conclusive. Not only are the results obtained to some extent conflicting, but if there were to be found evidence of an extra processing load in the interpretation of logical metonymies it seems that it would be compatible with both a computational approach and a pragmatic approach, thus offering no support for either over the other. Thus, more research, using more fine-grained experimental techniques, would be needed in order to settle this debate.

However, as I have already mentioned, an important theoretical motivation for a re-analysis of logical metonymy in pragmatic terms is the fact that computational linguistic accounts, in spite of their incorporation of considerable amounts of world knowledge into the lexicon (in the form of, e.g., ‘qualia structures’), still leave a lot of work for the pragmatic system to do in finding the interpretation that was intended by the speaker on a given occasion (specifically, in overriding ‘default’ interpretations in contexts where another ‘non-default’ interpretation was clearly intended). I claim that the wholly pragmatic, relevance-theoretic account is able to do this work, as well as that part of the interpretive work that a computational account does adequately. The question, then, becomes whether anything is to be gained in deriving some interpretations in one way (via a lexicon-internal mechanism) and others in a distinct way (via a pragmatic mechanism). Certainly, considerations of theoretical economy would favor the unitary pragmatic approach.

Conclusion

The central question in this paper has been whether logical metonymy should be seen as being processed by means of
the operation of linguistic processes or as being governed by pragmatic inferential processes. As the question indicates, it is possible to see the difference between these two types of accounts as one of degree only. While computational linguistic accounts maintain that a considerable amount of linguistic knowledge is involved in the processing of logical metonymy, the pragmatic inferential account that I have been defending here downplays the linguistic aspect and claims that logical metonymy is mainly interpreted by means of pragmatic inferential processes operating over underspecified logical forms, taking contextual information and encyclopedic assumptions about the denotation of the concepts involved as input to the inferential process. However, more than being a matter of degree, the difference between these two types of approaches is, in reality, to do with two fundamentally different conceptions of what a language is. While computational linguistic accounts see the language as providing a rich code that enables speakers to encode and decode their thoughts in much detail, and pragmatics as a useful add-on to the linguistic capacity, operating primarily when some interpretation other than the default interpretation generated by the linguistic system is indicated by the context, the pragmatic account pursued here sees the role of the linguistic system as being that of providing a minimal output or clue, which the inferential system uses as evidence to yield hypotheses about occasion-specific, speaker-intended meanings. As I have argued in this paper, the assumption that a large part of the interpretive work involved in logical metonymy should be attributed to the linguistic system itself requires further justification, given that we have an independently motivated pragmatic interpretive system which is capable of rapidly generating new meanings in different contexts.

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