

AGENT-DEPENDENT METONYMY IN A CONTEXT-CHANGE MODEL OF COMMUNICATION

1. METONYMY

A well-known problem in the semantic interpretation of natural language is presented by the use of referring expressions to not directly point at their intended referents, but at some associated object. Examples are:

- (1) I'm reading Shakespeare.
- (2) The London office called.
- (3) John works for this newspaper
- (4) Turn up the radio.
- (5) The buses are on strike.

The phenomenon illustrated by (1) - (5) is known as *metonymy*, which is defined in the Encyclopedia Britannica (Brittanica, 2000) as follows:

figure of speech in which the name of an object or concept is replaced with a word closely related to or suggested by the original

Metonymic expressions often have a predicate applied to a different type of argument than it expects. The examples (1) - (5) all illustrate this: one doesn't read a person, but something written by that person; an office cannot make phone calls, only someone in the office, and so on.

Hobbs (2001) gives a slightly different definition of metonymy, namely as:

the linguistic device by which an entity is referred to by referring to a functionally related entity.

By requiring a 'functional relation' rather than being 'closely related to or suggested by', Hobbs ties the relation between intended and indicated referents closer, and requires that the relation always delivers a uniquely determined intended referent.

The idea of a functional relation between intended and indicated referent can be expressed formally as follows. We represent the application of a predicate P to an argument a as $P(a)$, and the 'functional relation' that constitutes a bridge over the type mismatch between predicate and argument as a function f . The modification of an expression E , in which a type mismatch occurs, to form an expression E' in which the type mismatch is resolved, we denote by $E \rightsquigarrow E'$. The bridging relation f thus has the effect (6):

$$(6) P(a) \rightsquigarrow P(f(a))$$

The construction of a bridge for dealing with a type mismatch can be expressed in terms of types as follows. Let the predicate P be applicable to objects of type β ; P thus has the type of a function from β to the type *truthvalue*: $\text{Type}(P) = (\beta \rightarrow \text{truthvalue})$. Let the argument a have type α . The function f then forms a bridge between β and α if it turns objects of type α into objects of type β , i.e. if $\text{Type}(f) = (\alpha \rightarrow \beta)$. In terms of types, (6) corresponds to (7).

$$(7) (\beta \rightarrow tv)(\alpha) \rightsquigarrow (\beta \rightarrow tv)((\alpha \rightarrow \beta)(\alpha))$$

The phenomenon that the interpretation of an expression forces a part of it to be interpreted in a specific way in order to fit the context, is also known as *coercion*, and a function like f in (6) is called a *coercive function*. It may be noted that the representation of coercion in (6) can be read in two ways, since the right-hand side can be read as either (8a) or (8b):

$$(8) \text{ a. } P((f(a)))$$

$$\text{ b. } (P \circ f)(a)$$

The first of these expresses the view that the argument a is coerced into the argument $f(a)$, to which the predicate P is applied. By contrast, (8b) expresses that the coercive function is used to construct a new predicate $(P \circ f)$, leaving the original argument unaffected. Nunberg (1995) calls the latter form of coercion *predicate transfer*, and suggests that most cases of metonymy should be analysed in that way, rather than as referring to a different argument. He argues that coercion of the argument only occurs when a demonstrative is used, as when a speaker is holding up his car keys and says (9):

$$(9) \text{ This is parked out back}$$

Nunberg provides several arguments supporting the view that (9) is not a case of predicate transfer, such as the strangeness of continuing (9) with (10a), in contrast with the continuation (10b):

(10) a. *It only fits the front door.

b. It may not start at once.

Nunberg (1979) speaks of 'deferred ostentation' in cases like (9); perhaps '*argument transfer*' would be a more appealing terminology, paralleling '*predicate transfer*'. We will use the latter terminology.

The claim that most cases of metonymy should be viewed as instances of predicate transfer is supported by the examples (1) - (5) which, different from (9), can all be continued by referring to the *indicated* arguments, as the (a) sentences show, rather than to the *intended* referents, as the (b) sentences witness. (See also Copestake and Briscoe, 1995 for arguments supporting this view.)

(11) I'm reading Shakespeare.

a. Did you see the house where he was born when you were in Stratford?

b. *He is in rather small print, though, which makes the reading less enjoyable.

(12) The London office called.

a. It's the one in Fleet Street.

b. *It didn't say a name.

(13) John works for a newspaper.

a. It's the one that you like to read at breakfast.

b. *It was founded in 1945.

(14) Turn up the radio.

a. It's in the corner behind that plant.

b/ *It's too low for me to hear what they say.

(15) The buses are on strike.

a. They are otherwise quite comfortable.

b. *They want better payment and more security.

We noted, in connection with (6), that the introduction of a coercive function in the semantic representation in itself may not be sensitive to the distinction between predicate transfer and argument transfer; however, in a DRT-style representation of a discourse like the one formed by (9) and (10b), the interpretation of the pronoun *It* in the second sentence may be problematic on a predicate-transfer analysis, where the first sentence would have introduced a discourse referent of the type *key* which would not fit the pronoun in the second sentence.

Although metonymy often involves type mismatches between a predicate and an argument, this is not necessarily the case. The examples (16) and (17) illustrate this.

(16) Aimez-vous Brahms?

(17) The train is getting more expensive next month.

Sentence (16) can be a question about the addressee's amorous feelings toward Mr Brahms or about her appreciation of Brahms' music, depending on the context. The 'product-of' reading may seem more plausible, but if the context is for instance that of a novel about Johannes Brahms and his love affairs, then the 'direct' reading may be more plausible. Similarly, (17) may occur in a conversation where one of the participants is considering to buy a train, and the direct interpretation may be the intended one; in more mundane contexts, where traveling by train is in focus rather than buying a train, the interpretation that train *tickets* are going up is more plausible. In these cases, an interpreter may have to construct a bridge for getting over the type mismatch between a predicate and the *intended*, rather than the *indicated* argument.

The most influential and elaborate computational treatment of metonymy has been provided by Pustejovsky (1993; 1995). This treatment assumes that entries in a lexicon may contain *qualia structures*, a set of entailments associated with the lexical entry. Pustejovsky has proposed four basic *qualia roles*:

1. *constitutive*, relating an object to its parts;
2. *telic*, connecting an object to its function and purpose;
3. *formal*, distinguishing an object within a larger domain;
4. *agentive*, relating an object to objects involved in its creation.

For instance, the lexical entry for *newspaper* might be like in (18), which says that a newspaper is a daily magazine that is created by a company who publishes it:

- (18) *dailymagazine*(x)
 agentive: *company*(z) & *publishes*(z,x)

Qualia roles can be exploited when during interpretation a type mismatch is detected between the selectional restrictions imposed by a predicate, and one of its arguments.

Suppose for instance that in (3) the predicate *work for* is interpreted as *employs*(a,b), with the restrictions that a is a company and b is a person. Then *dailymagazine*(a) is not acceptable as interpretation of *newspaper*, since it is not a company. Following Pustejovsky's approach, we should then use one of the objects associated with the direct referent through some qualia role. In this case we could use *company*(a), which leads to a logical form like (19):

- (19) $\exists c$ *newspaper*(c) & $\exists a$ *company*(a) & *publishes*(a,c) &
employs(a,john)

This approach has been shown to be able to handle a wide variety of cases, in particular of instances of what Pustejovsky has called *logical metonymy*, where additional meaning seems to arise for noun-verb combinations or adjective-noun combinations in a systematic way, as illustrated by (20) and (21):

- (20) a. I've finished the book.
 b. Philippa enjoyed the book.
 (21) a. Richard likes a fast car.
 b. Einstein was a passionate violinist.

The general phenomenon that is illustrated by (20) is that a verb that semantically takes an eventuality is combined with an object involved in an eventuality; similarly, (21) illustrates the application of an adjective which semantically applies to eventualities (*fast* to *go*, *passionate* to *play*) to an object involved. In both types of examples it would seem inadequate to postulate different word senses for the verbs and adjectives involved, as Pustejovsky has argued. The use of qualia structures in a single lexical meaning provides a more adequate treatment. There are counterexamples for this approach, however. For instance, as Lascarides and Copestake (1998) have noted, if Philippa in (20b) is a goat, then the intended interpretation of *enjoyed eating the book* cannot be accounted for. (See also Briscoe et al., 1990). Similarly, if Richard in (21a) is an employee in a car demolition company, then the intended interpretation *car that can be demolished quickly* will be unaccounted



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