

## **IDENTIFICATION OF REFERENCE AND CONSIDERATION OF RELEVANCE**

**Tomoko Matsui**

*International Christian University*

*Tokyo, JAPAN*

*E-mail: matsui@icu.ac.jp*

**Abstract :** This paper addresses the issue of ambiguity in reference assignment, i.e. the question of how the correct referent is chosen amongst several potential candidates. Existing accounts of reference assignment either explicitly or implicitly stipulate that the interpretation determined by reference assignment must be plausible, i.e. compatible with one's general knowledge. Furthermore, they tend to predict that when there is more than one possible interpretation available, then the more plausible interpretation, i.e. the one which is more likely to be true, should always be preferred. I will demonstrate that this prediction is wrong and propose an alternative account based on the consideration of relevance (Matsui 1995; Sperber & Wilson 1986/1995). The results of some experiments I conducted to test subject's choice of referent will be used as evidence to support my argument.

**Keywords:** Pragmatics; Relevance; Reference.

### **1. INTRODUCTION**

The question of how the right referent is assigned to various types of referring expressions has been one of the central issues in the study of utterance interpretation, and has been explored extensively from different angles. However, there are still many puzzles left unanswered. Today, I would like to address one of these puzzles: what happens when the hearer is forced to choose from more than one potential referent for a referring expression in an utterance, and consequently, also has to choose from more than one possible resulting

interpretation of the utterance? The crucial question here is what criteria that hearer should use to choose the interpretation which was intended by the speaker.

I will argue that a criterion based on the notion of truth, i.e. the idea that the interpretation the hearer should choose is the one which is more likely to be true, in the sense that it is more consistent with his general knowledge, is not the one hearer actually uses. I will also argue that the criterion based on the notion of relevance introduced in Sperber & Wilson (1986/1995) is a better alternative to the truth-based criterion.

## 2. THE TRUTH-BASED CRITERION

Almost all existing accounts of reference resolution either explicitly or implicitly stipulate that the resulting interpretation must be plausible, i.e. consistent with one's general knowledge (e.g. Clark & Haviland 1977; Grosz et al. 1995; Sanford & Garrod 1981; Sidner 1983). Along similar lines, it has been widely accepted that when there are several possible ways of assigning reference, each resulting in a different interpretation, the hearer should choose the interpretation which is more consistent with his general knowledge, i.e. the one which is more likely to be true given his existing assumptions. This line of thought involves what I will call a 'truth-based criterion'. This, of course, is a good enough approximation, with a relatively high success rate. Thus, consider the following examples:

- (1)     a. The car rolled toward the telephone pole, and it hit it.  
 b. The car rolled toward the telephone pole, and it stopped it.

(Clark & Haviland 1977)

- (2)     a. Simon lent money to Jim because he needed it.  
 b. Simon lent money to Jim because he was generous.

(Sanford & Garrod 1981)

In order to work out that in (1a), the first 'it' refers to 'the car' and the second refers to 'the telephone pole', and that in (1b), the first 'it' refers to 'the telephone pole' and the second to 'the car', the hearer has to use the information, for instance, that when a car rolls towards a telephone pole, the car may hit the pole and be stopped as a result. Similarly, the hearer needs to work out the implications associated with 'lending' and 'being generous' in order to assign the right referent to 'he' in (2a) and (2b). The resulting interpretations of these examples are all perfectly plausible, and are definitely much more preferred to other possible interpretations. Thus, they confirm the view that the hearer should choose the interpretation which is more consistent with his general knowledge.

### 3. PROBLEMS WITH THE TRUTH-BASED CRITERION

When the choice between two or more possible resulting interpretations is less clear-cut, however, the weakness of the criterion begins to show. Consider the following cases of bridging:

- (3)     a. I prefer the town to the country. The traffic doesn't bother me.
- b. I prefer the country to the town. The traffic doesn't bother me.

In (3a) and (3b), an appropriate reference needs to be assigned to 'the traffic', although there is no mention of traffic in the previous sentence. A definite NP such as 'the traffic' in (3), which does not have an explicitly mentioned antecedent, is often called a bridging reference. In order to assign a referent to a bridging reference, the hearer has to infer the existence of the entity described by the definite NP using contextual assumptions. In the case of (3), the hearer is most likely to come up with assumptions such as (4a) and (4b):

- (4)     a. There is traffic in town.
- b. There is traffic in the country.

Assumptions such as (4a) and (4b), which are required to resolve the reference of a bridging NP, are often called bridging assumptions.

As you can see, in the case of (3a) and (3b), there are two possible ways of interpreting 'the traffic'. Accordingly, there are also two possible resulting interpretations for both (3a) and (3b), which might look like (5a) and (5b) respectively:

- (5)     a. The traffic in town doesn't bother the speaker.
- b. The traffic in the country doesn't bother the speaker.

The question is which of these interpretations the hearer will choose.

Examples such as (3a) and (3b) poses a serious problem for the truth-based approach. Bridging assumptions (4a) and (4b) seem more or less equally plausible, and so do the resulting interpretations (5a) and (5b). If this is the case, then, for (3a) and (3b), it is impossible to choose one interpretation over the other solely on the basis of their relative degree of plausibility. In other words, the truth-based criterion will not do here.

It might be argued that there is more traffic in town, and therefore, bridging assumption (4a) and the resulting interpretation (5a) are preferred for this reason. In that case, the truth-based criterion at least seems to be able to choose one interpretation over the other. But the question is whether this choice is the right one or not. According to a series of questionnaires I have conducted (Matsui 1995), subjects preferred (5a) as the interpretation of

(3a), and (5b) for (3b). So, the truth-based criterion rightly predicts the preference interpretation for (3a), but makes wrong prediction for (3b). Needless to say, why subjects prefer (5b) as the interpretation of (3b) has to be explained. Later, I will try to show one way of explaining it.

Before that, let us consider some more examples, which pose a slightly different problem for the truth-based criterion. Look at (6) and (7):

- (6) Mary moved from Lille to Paris. The rent was less expensive.
- (7) I left Italy for England. The weather is better.

The bridging assumptions required for these examples might be those in (8) and (9) respectively:

- (8) a. One pays rent in Lille.  
b. One pays rent in Paris.
- (9) a. There is weather of some sort in Italy.  
b. There is weather of some sort in England.

The possible resulting interpretations for (6) might be (10a) and (10b), and for (7), (11a) and (11b):

- (10) a. The rent in Lille was less expensive than the rent in Paris.  
b. The rent in Paris was less expensive than the rent in Lille.
- (11) a. The weather in Italy is better than in England.  
b. The weather in England is better than in Italy.

We all know that in general, the rent in Paris is more expensive than in Lille, and that the weather in Italy is better than in England. In other words, we have enough evidence to believe that Paris is a more expensive place to live, and that if you want to enjoy good weather, you should go to Italy rather than in England. Thus, the truth-based criterion would predict that the preferred interpretation for the second part of (6) and (7) should be (10a) and (11a) respectively. However, if my questionnaire results are right, for the majority of people, the preferred interpretation for (6) would be (10b), and for (7), (11b) would be preferred. This needs to be explained, and obviously, the truth-based approach cannot provide an adequate account here. In the next section, I will introduce an alternative account of reference assignment, based on considerations of relevance.

#### 4. THE RELEVANCE-BASED CRITERION

The idea that the hearer is entitled to choose the interpretation which is more likely to be true often stems from a more basic assumption, that communication is possible only when the speaker and the hearer share roughly the same factual assumptions. Furthermore, it is often suggested that there is a tacit agreement between the speaker and the hearer that for both parties to use such factual assumptions optimally, the speaker should only say things for which she has enough evidence, which is also shared and hence can be used by the hearer to obtain the intended interpretation. Needless to say, this is a view which is rather widely held, and appears under many different names, such as the mutual knowledge hypothesis (Clark & Marshall 1981), the principle of charity (Davidson 1984), or the co-operative principle (Grice 1975).

Sperber & Wilson (1986/1995) see communication in a rather different way. First, they claim that communication involves ostensive behavior: that is, a behavior intended to attract an audience's attention to some phenomenon. Second, they claim that ostensive behavior automatically creates an expectation, or presumption, of relevance, i.e. an expectation that the ostensive behavior will be relevant enough to be worth the audience's attention. This is one of the most fundamental claims in relevance theory, which is sometimes called the 'communicative principle of relevance':

*Communicative principle of relevance*

Every act of ostensive communication communicates the presumption of its own optimal relevance.

A hearer with this presumption will naturally look for an interpretation which is optimally relevant to him.

Sperber & Wilson claim that an utterance is optimally relevant (on a given interpretation) if and only if it satisfies both of the following conditions:

- (a) it has enough contextual effects to be worth the hearer's attention;
- (b) it puts the hearer to no gratuitous effort in obtaining those effects.

Here, two notions are important: contextual effects and processing effort. Contextual effects result from the interaction of new and old (or contextual) information and are categorised into three types by the way they interact with this contextual information, or context: 1. combining with it to yield contextual implications; 2. strengthening existing assumptions; 3. contradicting and eliminating existing assumptions. The greater the contextual effects, the greater the relevance. Processing effort can be described as the mental effort needed to parse

the utterance, decide what proposition and propositional attitude it was intended to express, access an appropriate context, and work out the contextual effects of the utterance in the context. The smaller the processing effort required - in other words, the easier it is for the hearer to recover the intended contextual effects - the greater the relevance. When an utterance has more than one possible interpretation, the hearer should choose the one which satisfies the above conditions, i.e. yields adequate effects, for no gratuitous effort.

However, as in any pragmatic theory, one has to also take into consideration the speaker's ability and preferences. The speaker could have a mistaken belief about what the hearer already knows or doesn't know, and consequently, her utterance may not be relevant to the hearer. Or the speaker may simply be incapable of finding a better way of communicating her intention. The criterion against which an interpretation of an utterance is tested should allow for this. Sperber & Wilson therefore propose the following as a criterion the hearer should use:

*Criterion of consistency with the principle of relevance*

An utterance, on a given interpretation, is consistent with the principle of relevance if and only if the speaker might rationally have expected it to be optimally relevant to the hearer on that interpretation.

This criterion allows the hearer to understand an utterance which is not actually optimally relevant to him, as long as the speaker's failure to construct such utterance seems reasonable to him.

Now let us go back to the examples (3a), (3b), (6) and (7). First, consider (3a) and (3b). Let's suppose that the resulting interpretations (5a) and (5b) are roughly equally plausible. As I mentioned earlier, according to the questionnaire I conducted, the preferred interpretation for (3a) was (5a), and the preferred interpretation for (3b) was (5b). What is crucial here is that although two possible resulting interpretations (5a) and (5b) look more or less equally plausible, there is a clear preference for one over the other. Although time limitations mean that I cannot discuss any more examples from the questionnaires here, I obtained similar results for many other cases. The question is why this is so.

Here is a relevance-theoretic explanation. First, let us see what contextual effects the second part of (3a) and (3b) might achieve in a context made accessible by processing the first part. Here, the first part of the utterance would raise an obvious question: Why does the speaker have this preference? By interpreting 'the traffic' as 'town traffic' in (3a) and 'country traffic' in (3b), the hearer can answer this question, and thus achieve adequate contextual effects. Thus, although the resulting interpretations (5a) and (5b) are both roughly equally

plausible, only one of them can achieve enough contextual effects in the most accessible context. As for processing effort, the fact that there is no other interpretation which is more immediately accessible, i.e. (5a) is the most accessible interpretation for (3a), and (5b) is the most accessible interpretation for (3b), suggests that no gratuitous effort is required. In other words, these interpretations are consistent with the principle of relevance.

The interpretation of examples (6) and (7) is a little less straightforward than (3a) and (3b). This is because the best interpretation for both of these examples seems to be somewhat inconsistent with our factual assumptions. Here again, the second part of both (6) and (7) can be interpreted in a context made accessible by the first part. In both cases, the second part could be interpreted either as giving a reason for the action described in the first part, or a consequence of the action mentioned in the first part. In either case, for (6), (10b) would be chosen as the intended interpretation, and for (7), (11b). What is crucial here is that although both interpretations (10b) and (11b) are less plausible than one might normally expect, since they appear to be the most accessible interpretations which yield enough contextual effects, the addressee is likely to be prepared to accept them as the intended interpretations. And this is so despite the fact that an utterance such as (6) and (7) tend to require more processing effort than utterances which yield a perfectly plausible interpretation. The criterion solely based on truth, or truthfulness, cannot provide any explanation for such a tendency.

Examples (6) and (7), and many other similar examples in my questionnaire, can be seen as illustrating the claim that the hearer's goal is to find an interpretation which yields enough contextual effects in the most accessible context, as relevance theory claims. And I would like to suggest that this is the reason why the hearer is more likely to accept an interpretation which turns out to be not quite as plausible as he would have expected, as long as it provides enough contextual effects, and as long as overall amount of the processing effort required seems reasonable to him. This doesn't mean that relevance theory ignores our intuitions about plausibility completely; on the contrary, plausibility is considered to be an important factor which affects the hearer's choice of interpretation. But the role it is considered to play in the process of interpretation is rather different from what the truth-based approach seems to suggest. The truth-based approach tends to assume that the interpretation which is more likely to be true is always the one which should be chosen, and that if this interpretation does not make much sense in the context of the prior discourse, the utterance should be judged unacceptable (e.g. Erku & Gundel 1987). In the relevance-based approach, on the other hand, the notion of truth, or truthfulness, plays a less central role. Plausibility affects relevance in two ways: first, it affects accessibility of assumptions, i.e. more plausible assumptions are more easily accessible to the hearer; second, the more plausible the assumptions, the greater the contextual effects, and hence the greater the relevance; in that way, it affects the overall acceptability of the utterance. Therefore, the relevance-theoretic

approach rightly allows for the possibility that the hearer would accept a less plausible interpretation, which might have been expected to provide enough contextual effects, as long as the amount of processing effort it requires does not seem gratuitous. And such interpretations are regarded as being consistent with the principle of relevance.

Needless to say, in interpreting an utterance, if the hearer can find an easily accessible interpretation that yields enough contextual effects and is also perfectly plausible, it is preferred to less plausible and less accessible interpretations, because it requires less processing effort in the sense that it does not require extra assumptions which might have been needed to accept less plausible ones. But if the most accessible interpretation yields enough contextual effects, the hearer is more likely to accept that interpretation as the intended one, even if it requires extra processing effort to extend or revise his existing factual assumptions. Relevance theory allows for the fact that implausible claims may be made and understood, even when more (factually) plausible interpretations are available.

## REFERENCES

Clark, H & Haviland, S.E. 1977. Comprehension and the given-new contract, in R. Freedle (ed), *Discourse Comprehension and Production*, 1-40. Ablex: Norwood, N.J.

Clark, H. & Marshall, C. 1981. Definite reference and mutual knowledge, in Joshi. A., Webber, B. and Sag. I. (eds), *Elements of Discourse Understanding*, 10- 63. Cambridge University Press, Cambridge.

Davidson, D. 1984. *Inquiries into Truth and Interpretation*. Oxford University Press: Oxford.

Erku, F. & Gundel, J. 1987. Indirect anaphors, in J. Verschueren & M. Bertuccelli- Papi (eds), *The Pragmatic Perspective*, 533-546. John Benjamins.

Grice, P. 1975. Logic and conversation, in P. Cole and J. Morgan (eds), *Syntax and Semantics, vol.3: Speech Acts*, 41-58. Academic Press: New York.

Grosz, B., Joshi., A.& Weinstein, S. 1995. Centering: A framework for modeling the local coherence of discourse, in *Computational Linguistics 21/2*.

Matsui, T. 1994. Bridging reference and style, in *UCL Working Papers in Linguistics 6*, 401-436.

Matsui, T. 1995. *Bridging and Relevance*. University College London, PhD thesis.

Sanford, A. & Garrod, S. 1981. *Understanding Written Language: Exploration in Comprehension Beyond Sentence*. John Wiley: Chichester.

Sidner, C. 1983. Focusing in the comprehension of definite anaphora, in M. Brady & R. Berwick (eds), *Computational Models of Discourse*, 267-330. MIT Press: Cambridge, Mass.

Sperber, D. & Wilson, D. 1986/1995. *Relevance: Communication and Cognition*. Blackwell: Oxford.

Wilson, D. 1992. Reference and relevance, in *UCL Working Papers in Linguistics 4*, 167-191.