

# Reference in Multidisciplinary Perspective

Philosophical Object, Cognitive Subject, Intersubjective Process

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## Referential ambiguities, possible worlds, and universes – the problem of substitution in contexts of propositional attitude

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In the past years and decades, contexts of propositional attitude have attracted the interest of many linguists and philosophers of language; for in such contexts, indefinite as well as definite NPs raise a number of problems of existence and substitution which have been widely discussed since Quine's *Word and Object* (1960), although few, if any, satisfactory answers have been found.

Building on the epistemic logic developed by Robert Martin (1983) in *Pour une logique du sens*, this paper is an attempt at clarification based on a distinction between two different types of contexts of propositional attitude.<sup>1</sup> Let me give a few examples:

- (1) *I ardently long for a popcorn machine.*
- (2) *Alberta believes that a dragon ate her petunias.<sup>2</sup>*

Neither the popcorn machine nor the dragon really exist; yet their non-existence is of a very different nature.

- (3) a. *Caesar is looking forward to meeting Brutus.*
- b. *Brutus is the man who will kill Caesar.*
- c. *Caesar is looking forward to meeting the man who will kill him.*

In examples of this kind, a false sentence of propositional attitude is deduced from a true sentence of propositional attitude and a true identity sentence.

The problem in all these examples is solved as soon as one applies the basic concepts of Martin's epistemic logic, i.e., the "universe" concept on the one hand and the "possible world" concept on the other.<sup>3</sup> It is necessary to keep these two concepts strictly apart.

The "universe" concept in linguistics and the philosophy of language corresponds to a radical subjectivism; it provides us with a formula for explaining the fact that, initially, it cannot be assumed that speaker and listener inhabit the same reality (see Martin 1983: 36-38). Language possesses well-developed mechanisms (indirect speech etc.) for indicating exactly when a speaker refers not to his own, but to another person's view of the world. Ex. (2) is very typical of such a shift between universes.

The "universe" concept must on no account be confused with the concept of (real vs. possible) "worlds". (The latter concept has a linguistic correlate in certain restric-

tions of pronominal anaphorisation.) The distinction between real and possible worlds has nothing to do with differences in subjective perspectives of reality, but with the well-known fact that within every individual's universe, certain things or situations exist as facts, whereas others exist as desiderata – such as the popcorn machine in example (1). Possible worlds are created by hopes, fears, expectations, goals etc. Robert Martin (1983: 30) defines them as “instants d'un temps ramifié” (instants of ramified time). The problems concerning the existence of NP referents in a transition to possible worlds are not the same as in shifts between universes. This is also confirmed by the fact that the two phenomena establish completely different referential ambiguities.

To explain this, let us contrast the above examples (1) and (2): Example (1) is ambiguous between three kinds of readings, which can be shown by continuing the sentence (now number (4)) in three different ways:

- (4) a. *I ardently long for a popcorn machine, though I do not even know if such a thing exists.*  
 b. *I ardently long for a popcorn machine, any of the thousands of popcorn machines that are being offered.*  
 c. *I ardently long for a popcorn machine, i.e., the one I admire every day in the shopwindow round the corner.*

In the first case (4a) the popcorn machine exists only hypothetically, i.e., to express it in Robert Martin's terminology, it exists in a possible world, the world of my wishes. It is interesting to notice that, even though the popcorn machine has been duly introduced with an indefinite noun phrase, it would be impossible in this reading to mention it with a definite expression, for instance a pronoun, in the real world (see (4a')). Having been introduced in a possible world, the referent of the NP *popcorn machine* thus becomes definite only within this possible world itself (see (4a')).<sup>4</sup>

- (4) a. *I ardently long for a popcorn machine, though I do not even know if such a thing exists,*  
 a'. \* *...and I use it every day.*  
 a'' *...and I would like it to be red and yellow.*

The second and the third readings of example (4), i.e., (4b) and (4c), share the feature that the popcorn machine exists in the real world: the difference between these two readings concerns its identity: in (4b), the identity of the popcorn machine does not matter to the speaker, whereas in (4c), it is a very specific specimen that is being meant.

So, the referential ambiguities occurring in examples of our first type are of two different kinds: first, there is an ambiguity between a reading which I will call “hypothetical existence” (existence in a possible world) (ex. (4a)) and another one that could be called “factual existence” (existence in the real world) (ex. (4b) and (4c)).<sup>5</sup> And then, within the field of factual existence, another ambiguity can be observed between

what I call a specific and a non-specific reading (ex. (4b) versus ex. (4c)).<sup>6</sup> It must be said that the specific/non-specific ambiguity, the nature of which is a discrepancy in the importance the speaker gives to the identity of the referent,<sup>7</sup> might occur in any context where the “factual existence”-feature is given. This means that, unlike the hypothetical/factual existence ambiguity which requires a very special kind of context to occur, the specific/non-specific ambiguity can appear even in the most banal kinds of contexts (see ex. (5)):

- (5) a. *At that time, I was just coming home from a trip, but I can't remember which one it was.*  
 b. *At that time, I was just coming home from a trip, it was my third trip to Cuba...*

No possible worlds are involved here, no “contexts of propositional attitude”, and yet there is a referential ambiguity. So we can see that the specific/non-specific ambiguity is not bound to a special context type (unless we consider the required feature, “factual existence”, as something very special), and it occurs in the factual reading of our “type one”-contexts (*I ardently long for...*) without therefore being characteristic of this particular type of context. Nevertheless, I thought it necessary to mention it here, because I want to clearly demarcate it from the hypothetical/factual existence ambiguity which is the really important one if we want to study contexts of propositional attitude.

So, we can say that in contexts which resemble our examples (1) and (4), one main referential ambiguity occurs, namely the ambiguity between a factual and a hypothetical existence of the referent. But for what kind of noun phrases is this valid? And what are the contexts that resemble our examples (1) and (4)? The first question is very easy to answer: all the ambiguities described hold only for indefinite noun phrases. Actually, if we replace the indefinite NP *a popcorn machine* by some definite NP:

- (6) *I ardently long for the Prime Minister.*  
 it is evident that there is only the “factual existence” reading left. (This is not surprising, as everybody knows that definite noun phrases presuppose the existence of their referent.)

The second question is slightly more difficult; but in fact, it is evident that the contexts in question must be such contexts as trigger the transition into a possible world. Now, what do these contexts look like? As a possible world is defined as “an instant of ramified time”, any context implying the idea of future might be considered a “type one” context:

- (7) *The Prime Minister fears an electoral defeat.*  
 (8) *My aunt had promised to offer me a popcorn machine.*  
 (9) *Tomorrow we are going to paint a dragon.*

But the present is not absolutely certain either, and it is possible to formulate hypotheses or questions about its nature:

- (10) *If this woman has a husband, he must be very happy.*  
(11) *Have you got a bed of petunias in your garden?*  
And the same holds even for the past:  
(12) *Has the actual Prime Minister ever suffered an electoral defeat?*  
(13) *If she had a petunia in her garden then, that explains everything.*

It is very interesting to see that we started from a classic example of a so-called "verb of propositional attitude", but arrived at a group of expressions which do not even share the feature of being verbs; the only and essential feature they share is that they trigger a transition into a possible world. As a consequence of this, they all create the same referential ambiguity between a hypothetical and a factual existence reading and, in the hypothetical reading, they all bring about the impossibility of re-mentioning a referent introduced through an indefinite noun phrase (unless the re-mention takes place within the possible world itself).

Now that we have elucidated the ambiguities our sentence (1) stands for, we can proceed to sentence (2), which is also an example of what has been called an "expression of propositional attitude". And yet, the ambiguities corresponding to this second type of context have nothing to do with the "type one" ambiguities.<sup>8</sup> Again, we can show the three possible readings clearly if we continue the sentence (now number (14)) in three different ways:

- (14) a. *Alberta believes that a dragon ate her petunias; but I saw the beast, and it wasn't a dragon, it was a kolibri.*  
b. *Alberta believes that a dragon ate her petunias; in fact, she did not recognize it as such, she simply spoke of a small green and blue beast that came through the air, but I knew at once what she meant.*  
c. *Alberta believes that a dragon ate her petunias; I saw it too, but in fact it did not eat them; it simply wanted to smell them.*

The ambiguity in this kind of example concerns the attribution of a certain description to the referent. In the first reading (14a), the speaker reports the description Alberta used to describe what she saw, even though he himself does not agree with this description of the referent; in the second reading (14b), we notice that it is the speaker who gives his description of the referent, a description with which Alberta would not be prepared to agree. And finally, in the third reading (14c), both Alberta and the speaker assign the description *a dragon* to the beast they have seen.

Sentence (14a) illustrates what a number of linguists have described as the "opaque reading" of a noun phrase; sentence (14b) shows what is meant by the "transparent reading".<sup>9</sup> This opaque/transparent ambiguity has often been described, but it was

only a few years ago that a linguist (Kleiber 1979: 246–248) pointed out the existence of a third reading, which is far more common than the other two: it is the unmarked reading, as illustrated in sentence (14c).

Not the existence, but the description of the referent is the crucial point in our "type two" examples. Again, we shall examine which are the noun phrases affected by this ambiguity, and in which kinds of contexts it is likely to appear.

It can easily be shown that, unlike the hypothetical/factual existence ambiguity which appears only in indefinite NPs, the opaque/transparent (unmarked) ambiguity can be observed just as well in definite noun phrases. To illustrate this, I shall finally give an example of the type traditionally quoted in relationship with this problem, i.e., a "matrimonial" example:

- (15) *Alberta recently married the oddest character in the world*  
a) *...as she said; but when I met her husband, I didn't notice anything special about him.*  
b) *...but I'm afraid she doesn't even know what a rare jewel she's got.*  
c) *...and she's even proud of it!*

As for the kind of contexts concerned, it is clear that the only thing this ambiguity really demands is the presence of a reported speaker distinct from the reporting speaker who is uttering the sentence. The opaque/transparent (unmarked) ambiguity can only occur in such contexts where the speaker does not talk about his own thoughts and feelings, but about those of another person, whom we call the reported speaker. If we relate this to the basic concepts of Robert Martin's epistemic logic as quoted above, we notice that the type of contexts required are contexts with a *shift between two different universes*. In our examples, these are the speaker's universe on the one hand and Alberta's (the reported speaker's) universe on the other. The referential problem given is not a problem of existence, because the referent exists in both of these universes. It is a problem of description, because the qualities assigned to the referent differ in the two universes involved. Therefore, the descriptions through which the referent can be mentioned are not the same for the speaker and for the reported speaker, which leads us to a whole series of substitution problems between co-referential definite descriptions, and thus to the crucial question to be discussed in this paper.

These substitution problems are said to occur mainly in the so-called "contexts of propositional attitude" or "opaque contexts". These contexts are usually defined as contexts expressing the intellectual or emotional attitude of a person towards a certain state of things. Through the dichotomy introduced by Robert Martin between "possible worlds" on the one hand and "universes" on the other, it could be shown that "contexts of propositional attitude", as exemplified in our sentences (1) and (2), are far from constituting a unique, homogeneous category.<sup>10</sup>

On the contrary, it is necessary to distinguish clearly between two totally different types of such "opaque" contexts: one corresponds to verbs such as *hope, fear, look for,*

etc., and indicates a transition into a possible world; the other is triggered by verbs such as *believe*, *think*, *mean*, *say*, etc., in cases where the subject is not identical with the speaker. In the latter type of contexts, it is a transition into another *universe* that is taking place; the decisive factor in this transition is not the type of verb, but the presence of a speaker who is being referred to. (Contexts of the first type might be called "opaque", the second type, "oblique".) The confusion between the two types of contexts may be due to the fact that the two phenomena described (shift between worlds and shift between universes) often occur together, e.g., in sentence (16):

(16) *Alberta would like to own a dragon.*<sup>11</sup>

But the very fact that they can occur together – or not – proves that they are not identical. Actually, it can be shown that the above example (16) carries the possibilities for both (or even all three) types of ambiguities mentioned and can therefore be considered as seven times ambiguous:<sup>12</sup>

- (16) a. .... *even if no such creatures might exist.*  
 (hypothetical existence)
- b. .... *any one of the ones she saw at the zoo.*  
 (factual existence, non-specific, unmarked reading)
- b'. .... *but in fact what she took for dragons were koalas.*  
 (factual existence, non-specific, opaque reading)
- γ'. .... *taking them for simple crocodiles.*  
 (factual existence, non-specific, transparent reading)
- c. .... *whose name is Crabbledibax.*  
 (factual existence, specific, unmarked reading)
- c'. .... *but in fact Crabbledibax is simply an iguanodon.*  
 (factual existence, specific, opaque reading)
- c". .... *because she takes him to be Alf, the extraterrestrial.*  
 (factual existence, specific, transparent reading)

Having described now the different kinds of referential ambiguities susceptible to appear in "type one" - and "type two", i.e., opaque and oblique, contexts, it is time for us to proceed to explain substitution problems, as they appear in examples like (3) (the Caesar and Brutus example).

The claim that brings about all the much discussed substitution problems is the following: As a general principle, it should be possible, in any context, to replace ("substitute") any definite description by any other definite description having the same referent, without thus modifying the truth value of the sentence – what Leibniz called *salva veritate*.<sup>13</sup>

The problem is now that there are quite a lot of context types in which such a substitution *salva veritate* is impossible or at least problematic. These are the so-called "opaque contexts", which have been widely studied in the last few decades.

To begin with, it must be noticed that the substitution question concerns only definite NPs. The reason is that nobody ever pretended that indefinite noun phrases should be replaceable by each other *salva veritate*. In fact, some linguists tried to formulate the so-called "substitution principle" independently of definiteness or indefiniteness (e.g. Kleiber 1983: 233–234). But even they had to speak of noun phrases with identical reference. And it is very difficult to say what "having identical reference" should mean for indefinite NPs, which do not even identify their referent with accuracy!<sup>14</sup>

So, the limitation of the substitution principle to definite noun phrases on the one hand and the substitution problems mentioned above with the opaque/transparent ambiguity on the other suggest a certain proximity of substitution failures to the "universe" concept as described above. Actually, it is this concept that will help us to understand what happens between sentences as (3a) and (3c). But let us start from the beginning.

It was Leibniz who first formulated the substitution principle, but the problem with "opaque contexts" was raised by Quine (1960). There is no space here to quote the whole of his well-known definitions of opaque and transparent contexts, but the main criterion is that the substitution principle does not work for opaque contexts.

He begins by stressing such contexts in which the NP in question receives a sort of metalinguistic commentary:

(17) *'Tully was a Roman' is trochaic.* (Quine 1960: 142)

In this context, *Tully* cannot be substituted by *Cicero*, even though the two names stand for the same person. Quine therefore calls it an opaque context. Despite the accuracy of his observation, Quine is guilty of deliberately mixing up language and metalanguage phenomena (see Galmiche 1983: 64, footnote 5). So this is not a real substitution problem on a purely linguistic level.

Another kind of substitution problem, closely related to the above type, is created by quotations and similar examples:

(18) *"Tully was a Roman", said W.V.O. Quine pensively.*

As in example (17), substituting *Cicero* for *Tully* would change the truth value of the whole sentence. But the explanation for this substitution failure is again the existence of a metalinguistic level.

Let us proceed to the next stage: it is trickier than the first two, as it concerns indirect speech. Suppose I heard Mr. Quine say literally: "Tully was a Roman", and I then quoted him by reporting:

(19) *Mr. Quine is convinced that Cicero was a Roman.*

What about my substitution of *Tully* by *Cicero*? Well, some linguists would consider example (19) as ambiguous between a *de dicto* and a *de re* reading (e.g. Zuber 1974

and maybe also Bach 1975: 82). In the *de dicto* reading, sentence (19) would be false, as this reading takes the wording of the original utterance to be the only criterion for a correct quotation. In the *de re* reading, sentence (19) would be true, as I quoted the exact content of Mr. Quine's utterance, changing only the name used to describe the referent of the subject. Actually, I don't agree with this view, because the *de dicto* reading corresponds exactly to the claims made for literal quotation. If language has developed such a thing as the opposition between direct and indirect speech in order to distinguish clearly between literal and non-literal speech reports, it is a useless complication to try to distinguish again, within the field of indirect speech, between a literal/direct and a non-literal/indirect reading. The essential function of indirect speech is precisely to permit a report of the content of someone else's utterance, without being constrained to literal quotation. Therefore, I do not consider sentence (19) ambiguous, but very simply a true sentence.

Nevertheless, the situation in which sentence (19) is uttered can give rise to a classic type of substitution problem, as soon as we admit that Mr. Quine ignores the fact that Tully and Cicero were one and the same person. On the contrary, he might firmly maintain that they were two different persons, and that he had never stated that Cicero was a Roman.<sup>15</sup>

Now what becomes of the substitution problem under this hypothesis? First, did I have the right to replace the description *Tully* by the co-referential description *Cicero*? And second, does it matter that Mr. Quine himself strictly denies my report as formulated in sentence (19)?

Quite a lot of pages have been written about these two questions, and yet I believe that neither of them belong to the field of linguistics. At least, they are not formulated in a linguistic way. The linguistic way of putting the first question cannot be: Do I have the right to operate the substitution between two descriptions of the same referent? *but rather*: If a speaker substitutes one definite description by another one applying to the same referent, why does he do so (pragmatic aspect), and what is the effect of this substitution (semantic aspect)? And the second question should then be: How can it happen that a reported speaker denies having uttered a proposition, only because the description of the subject referent has been modified?

Of course, all of this becomes very clear as soon as one applies the "universe" concept to this kind of problem.

We can answer the questions asked above starting with the last one, because this last question nearly carries its own answer within itself: A reported speaker can and will of course deny having uttered a proposition, if the description of the subject referent has been modified and *this new description does not apply to the referent in question in the reported speaker's universe*. So if we speak of replacing one definite description by another definite description *having the same referent*, we cannot do this without asking at the same time *for whom* these two descriptions apply to the same referent.

If you want to answer now that they should apply to it objectively, then I must ask you who could tell us reliably whether they actually do so; and why this objective reality should matter in any way to the speaker and the reported speaker involved. This means of course, I am defending here a radical subjectivism.<sup>16</sup> I am doing so for linguistic and not merely for philosophical reasons; for I'm simply maintaining that only a radical subjectivism can prevent us from putting substitution questions in an absurd and unsuitable way.<sup>17</sup>

If we consistently relate the problem of referent description to the concept of universe, it becomes easy to explain what happens between sentence (18) and sentence (19): the passage from (18) to (19) is valid for me because I am convinced that Tully and Cicero are one and the same person; it is valid for Mr. Quine only if he shares the same view. If he does not, it is normal that he will contradict me. This does not mean that I did not have the right to substitute his description *Tully* by my description *Cicero*. Maybe I was even obliged to do so, speaking to a hearer who ignores Cicero's other name and who would therefore not have understood which referent was meant.

By the way, the problem of the hearer is maybe the crucial one in the choice of a definite description. Pragmatically speaking, it must be pointed out that it is the knowledge of the hearer that determines which definite descriptions can be used in a certain situation (and/or context) in order to refer to a certain object. Therefore, the universe of the hearer is much more relevant to substitution possibilities than for instance the universes of the speaker or of the reporting speaker. And if we want to describe with even more accuracy what happens when the speaker chooses a definite description, we have to say that he tries to guess at the universe of his hearer and at the description best adapted to guarantee a correct identification of the referent intended.<sup>18</sup>

So much for the importance of being the hearer; but even if we consider only the relationship between the speaker and the reported speaker, asking if I had the right to substitute *Tully* by *Cicero* introduces a normative aspect to the problem, which should not be mixed up with the descriptive part of it. Actually, there are two questions which should be asked separately: In a situation where a speaker reports a propositional attitude of another speaker,

- first, what happens when he substitutes one definite description by another?
- and second, under which conditions can he be said to have reported the other person's views correctly?<sup>19</sup>

When formulating the first question and also when speaking about examples (18) and (19), I deliberately avoided speaking about objective reality. As I have already pointed out, the problems treated here can be seen much more clearly if we abstain from considering the question which of the two communication partners is objectively right.

(Whether Cicero and Tully actually *were* one and the same person, has nothing to do with the substitution problems raised above; in fact, I did not perform the substitution because they really were identical, but because I *believed* they were (and I be-

lieved my hearers knew this, or they knew at least who Cicero was). And Mr. Quine contested it only because of his own beliefs. Neither I nor he have access to objective reality.)

The "universe" concept frees us from all the complications raised by objectivism, because it permits (and even constrains) us to relate the truth of sentences as well as the accuracy of descriptions to the beliefs of a certain communication partner.

Therefore, the claim of a substitution *salva veritate* (or of a quotation *de re*<sup>20</sup>) has to be re-formulated: Substituting a definite description valid for a referent *in a certain universe* by another definite description applying to the same referent *in the same universe* should not modify the truth value of the whole sentence *in this particular universe*. Formulated in this way, the substitution principle is universally valid, apart from sentences with metalinguistic phenomena.

I will show now that, effectively, all the substitution failures described in the related linguistic literature can be explained by shifts between universes.

As described by Bähr (1986: 66–68), there are three different types of substitution failures in contexts of propositional attitude:

1. Modification of information (see ex. (3))
2. Contradiction of information

(20) a. *Mr. Quine thinks that Cicero is not Tully.*

b. *Cicero is Tully.*

c. *Mr. Quine thinks that Cicero is not Cicero.*

3. Suppression of information (tautology)

(21) a. *George fears that Pedro's child has starved.*

b. *Pedro's child is the child that has starved.*

c. *George fears that the child that has starved has starved.*<sup>21</sup>

Bähr (1986: 208–212) argues that the third type of substitution failure is not as great a problem as the other two, as it has never been said that a sentence deduced from two other sentences should have a higher information value than the two sentences themselves. In examples which represent this type in its pure form, we simply have two true sentences that lead to a tautology, but a tautology is not a false sentence. But if we look carefully at example (21), we notice that the tautology simply corresponds to the content of the subordinate clause. The whole sentence itself is not a tautology; it is merely absurd, as it seems absurd to fear something which is true anyway. So, (21c) is in fact a contradiction, just as are (20c) and, in some way, (3c).

In fact, all three types of substitution failure follow one and the same principle: They start from a sentence (a) expressing a propositional attitude and containing a definite description; and this sentence (a) is taken to be true. They add then a sentence (b) which is an identity sentence between two definite descriptions, with the 'above-mentioned definite description as one of its members; and this sentence (b) is also

taken to be true. They deduce from these two a third sentence (c), which is again a sentence of propositional attitude, obtained by replacing the definite description of (a) by the other definite description given in (b). And what is disturbing about sentence (c) is that, though deduced from two very normal sentences which are taken to be true, (c) is a false or at least an absurd sentence.

So, what happens in such examples between sentence (a) and sentence (c)? This is easy to explain as soon as we admit that neither sentence (a) nor sentence (b) can be regarded as true in an objective manner. Their truth – and, also, the falsity of (c) – must be related to the concept of universe. This absolutely *has* to be taken into account, because (a) and (c) are by definition sentences of propositional attitude, and this means, sentences involving a reported speaker.<sup>22</sup>

Bähr (1986) puts it very clearly: he distinguishes between two communication situations with two different dyads of communication partners. The first situation is the reported situation, which takes place between the partners S1 (speaker 1) and A1 (addressee 1); the second situation is the reporting situation, involving speaker 2 (S2) and addressee 2 (A2).<sup>23</sup> The propositional attitude in question is a propositional attitude of the speaker S1, and his examples are quoted in the following way:

- (22) a. S1 *Peter freut sich, daß Herr Maier zu Besuch kommt.* A1  
 b. S2 *Herr Maier ist der Mann, der Peter umbringen will.*  
 c. S2 *Peter freut sich, daß der Mann zu Besuch kommt, der ihn umbringen will.* A2 (Bähr 1986: 66)

Now let us recall what we said above about the opaque/transparent/unmarked reading of definite descriptions. In a situation with a reported speaker (S1) and a reporting speaker (S2), a description is said to be *transparent* if it reflects the view of the reporting speaker (S2), but not that of the reported speaker (S1); it is said to be *opaque* if it reflects the view of the reported speaker (S1), but not that of the reporting speaker (S2); and its reading is *unmarked*, if the description corresponds to a view which is shared by both the reporting and the reported speaker (S2 and S1).

Now, if we apply this to our examples (3), (20) and (21), several cases are likely to emerge, though they are not equally probable. The only case that really seems absurd is that of an unmarked reading of all three sentences (a), (b) and (c). But we have to consider seriously the following possibilities:

*Sentence (a):*

Being a sentence of propositional attitude (i.e. a sentence involving a reported speaker), sentence (a) is by its very nature ambiguous between an opaque, a transparent and an unmarked reading. It is important to notice this, as it could introduce an additional complication from the very beginning. As far as I know, scholars have always taken sentence (a) to be unmarked, i.e., the definite description in (a) to be valid for S1 and for S2. Therefore we will also adopt this hypothesis. But it is important to notice that it is not the only possible one.

*Sentence (b):*

This is the crucial sentence. In effect, all substitution problems arise from the fact that in our absurd examples, sentence (b) can only be true in a transparent reading; i.e., (b) is true for S2, but never for S1!

What happens if we consider (b) to be true only for S1 (opaque reading), or for S1 and S2 at the same time (unmarked)? Well, this would mean that S1, the reported speaker, holds an absurd propositional attitude, i.e. that the contradiction given in sentence (c) is really contained in S1's universe. Actually, in some cases this might be possible, and it should also be possible to express it in some way.

But the most likely interpretation of our substitution failure examples is obviously the one that assigns a transparent reading to sentence (b) (i.e. of course, to the new description in sentence (b)).

*Sentence (c):*

We have just noticed that the most common interpretation of our example type considers (a) to be true in an unmarked, and (b) in a transparent reading. As (c) is now a sentence that is deduced from (a) and (b), it is obvious that (c) can be true only in a transparent reading.

As I have already pointed out, the truth of sentences has to be related to the concept of universe. The truth of (a) and that of (b) do not relate to the same universe; so (c) can only be true in a universe in which both (a) and (b) are true. In our hypothesis, (a) is true in the universes of S1 and of S2; but (b) is true for S2 and false for S1. Therefore, in the universe of the reported speaker S1, (c) is not deduced from two true sentences, but from one true and one false sentence, and it is no wonder that it is false, or at least strange.

In the universe of the reporting speaker S2, however, (c) is deduced from two true sentences, and it can be shown that in this universe (c) is true. Just try to consider the (c)-sentences from S2's perspective instead of S1's, and they don't seem absurd any longer. Actually, it can easily be imagined that a speaker S2 utters a sentence of type (c) precisely to point out that, in his perspective, a reported speaker S1 holds a propositional attitude which he would give up immediately if he shared S2's view of the referent.

This leads us back to a question we raised above: the question of true reporting. This is the normative aspect of our problem, and we can attack it now, because we have already dealt with the descriptive aspect. The question can be put in the following way: Under which conditions is it possible to say that a reporting speaker S2 has given a true account of the views of his reported speaker S1, and when do we have to admit that he has distorted them? That is, what substitutions of definite noun phrases are admissible from this viewpoint?

The answer is simple: the reporting speaker may carry out any substitution corresponding to his own view of the referent, or, what is more important, corresponding to

the needs of his hearers. But if he uses a definite description in an utterly transparent way, i.e., knowing very well that the reported speaker would not agree with it, he should clearly signal to his hearers that this description holds only for his own universe. Language has developed a series of suprasegmental and even lexical means of signalling a transparent reading (such as the phrase *what I would call* and various others). Of course, in some situations, such signals are superfluous, as hearers know the reporting and the reported speaker well enough to understand who is the author of the definite description used (see Kleiber 1979: 247). But if this is not the case, a reporting speaker deliberately using a transparent description without showing that he is doing so might be called dishonest.

The question of lies is the only way, or at least so it seems to me, a normative aspect could be introduced to the substitution problem.<sup>24</sup> But as long as we do not consider the possibility of deceit, it is preferable to keep to a strictly descriptive attitude. I mention this because it seems to me that Quine (1960: 146–156) as well as Bähr (1986: 74–77, 84–85, 138–139, 149), who have both studied the substitution problems in depth, wish to elaborate a theory that could avoid or eliminate sentences like (3c): *Caesar is looking forward to meeting the man who will kill him*. Such sentences cannot be avoided, and their elimination cannot be the aim of a linguistic theory. On the contrary, linguistics should rather try to explain why such sentences are in fact possible, and what precisely happens when they are uttered. I hope to have demonstrated that this can be explained in a simple manner, and that Robert Martin's epistemic logic has an important contribution to make to the study of referential substitution failures.

Notes

- <sup>1</sup> I have already dealt with the problems of these context types and the related ambiguities and substitution failures in Lavric (1990a).
- <sup>2</sup> This example is taken from Ioup (1977: 235).
- <sup>3</sup> I know Martin's further development of his theory as presented in "Langage et croyance" (1987). It is very interesting, but less easy to apply to the problems discussed in this paper. For a critical acknowledgement of both of Martin's studies see Lavric (1990 b).
- <sup>4</sup> See Heinz (1982: 33, 38), but also Dausendschön-Gay (1977: 160) quoting Karttunen (1969); Oomen (1977: 96) quoting Karttunen (1968: 5–6 and 1972: 180); Ioup (1977: 237) and Van Langendonck (1979: 38–39) and (1980: 218).
- <sup>5</sup> Werth (1980: 258) calls this opposition "specific/non-specific". This is not the meaning I give to this linguistic term.
- <sup>6</sup> A linguist who distinguishes clearly between these two types of ambiguities is Galmiche (1983: 70). And Ioup (1977: 239–240) has also noticed the problem, as well as Van Langendonck (1980: 218–219).



- 7 The view that relates the feature of specificity to the person of the speaker is shared by Kaneko (1971: 95), Tabakowska (1980: 194–195), Sroka (1983: 15), Martin (1983: 156) and Zhou (1985: 122).
- 8 In fact, as is shown in Ioup (1977: 235), the example with Alberta and the dragon also carries the possibility of the specific/non-specific ambiguity. But this is not what we will examine here.
- 9 See Lawler (1977: 111), Kleiber (1979: 246–248), Galmiche (1983: 62–63), Martin (1983: 37–38).
- 10 In the following studies, the two context types are not distinguished: Quine (1960: 150), Partee (1970: 416–417), Van Langendonck (1980: 217), Ioup (1977), Lawler (1977: 110), Givón (1978: 294), Kleiber (1979: 234, 241), Galmiche (1983: 64).
- 11 See also the example in Bach (1975: 88–89).
- 12 Even more readings can be found if we consider the problem of the existence of the referent as related to the universes of reporting and reported speaker. For instance, dragons might have hypothetical existence for Alberta, but real existence for the reporting speaker, and vice versa.
- 13 For this criterion, see the linguistic literature quoted in Galmiche (1983: 61, footnote 4).
- 14 Actually, "having identical reference" can be defined even for indefinite noun phrases. This presupposes of course a clear view of how indefinite reference functions. To put it briefly, indefinite reference involves not only the set of actual referents that are being meant, but a second and larger set of virtual referents containing all the objects this very noun with these very attributes could possibly refer to in this very context. The nature of indefinite reference consists in the fact that only part of this virtual reference set is taken over to be the actual reference set of the noun phrase.
- This brief description makes it clear what "having identical reference" could mean for indefinite noun phrases: it means basically that two noun phrases share not only their actual reference set itself, but also the set of virtual referents given through the meaning of the noun and its attributes and through a certain number of contextual factors. It seems very improbable that another noun with maybe other attributes should circumscribe the same virtual reference set, unless it were a bare synonym. Therefore, a substitution of an indefinite NP by another indefinite NP *salva veritate* could function only if the two noun phrases were exact synonyms.
- 15 This example was inspired by an example in Quine (1960: 145).
- 16 A similar position is defended e.g. in Watzlawick & Beavin (1980: 102–108).
- 17 This is one of the problems in Bähr's (1986) recent study about the substitution problem in contexts of propositional attitude. In effect, he makes the claim that it should be possible, through a communication process which can sometimes be rather difficult, to establish a kind of objective reality between a group of communication partners (see Bähr 1986: 157–159, 181–183, 190–192).

- 18 Donnellan (1971: 106, 112) even points out that in some situations, it might be necessary for the speaker to use a description he himself is by no means convinced of, because this is the only description which will allow his hearer to identify who is being meant.
- 19 See Bähr (1986: 207–208).
- 20 In fact, it is not surprising if I suggest at this point replacing the expression *de re* by the expression *de locutore*.
- 21 This example is the translation of a German example quoted by Bähr (1986: 68).
- 22 Unless they are in the first person; but in this case, no problems of substitution arise.
- 23 Actually, Bähr himself and his reader constitute a third dyad S3 and A3; and I myself quoting Bähr should then logically be S4.
- 24 A recent and comprehensive study of this question has been presented by Falkenberg (1982).

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# A model for temporal reference in texts

Anita Steube

## 1. Object of research

Sentences denote situations. One inseparable aspect of every situation is the time of the situation. Situations are of two different kinds:

- (a) *events*: comprising events proper (uncaused events) and actions.  
The course of an event is either front- or end-limited and so is the course of the time of the event.
- (b) *states*: comprising states proper, activities and processes.  
The course of time of a state is unlimited just as the state itself is. Therefore, every proper part of a state must be a state itself, whereas not all the proper parts of events can be events.

A sentence denoting a situation has a phonological, syntactic and semantic representation. When semantic representations of sentences are called *propositions*, a situation is an instance of a proposition. When a proposition selects the semantic representation of an adverbial of duration as a modifier, the situation which is an instance of the corresponding proposition is a state. When it does not select an adverbial of duration, it is an event. We give examples on the basis of unanalysed sentences:

- (1) \*The rock rolls down the hill for half an hour. (event proper)
- (2) \*Peter rolls the rock down the hill for half an hour. (action)
- (3) Grandfather will sit in the armchair for two hours. (state proper)
- (4) Peter was swimming for half an hour. (activity)
- (5) The rain dripped through the roof all night long. (process)

The first two sample sentences can be interpreted only when the instantiation of the propositions of the sentences *The rock rolls down the hill* and *Peter rolls the rock down the hill* are complex situations consisting of an unlimited number of repetitions of the simple situations *The rock rolls down the hill* or *Peter rolls the rock down the hill*.

What are the objects of research in a theory of temporal reference in texts? We will use sentence (6) as an example:

- (6) *Peter arrived last night at eight o'clock.*

A theory of physical time would state that the time of the event *Peter arrive* is a continuous unidirectional path. In addition to the properties of time a physical theory of time has to take into account, man conceptualizes time from the interval of time of

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