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Indexical Expressions

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I

Even very superficial investigation into the linguistic habits of users of ordinary language will reveal that there are strong variations in the degree of dependence of the reference of linguistic expressions on the pragmatic context of their production. Whereas, for instance, the sentence

(1) Ice floats on water

will be understood by almost every grown-up normal English-speaking person to refer to the same state of affairs (this statement needs, strictly speaking, some qualifications which, however, in view of their generality, do not disturb the distinctions we are going to make), what the sentence

(2) It's raining

is intended to refer to will be fully grasped only by those people who know the place and the time of its production, and the identification of the intended reference of the sentence

(3) I am hungry

will require the knowledge of its producer and the time of its production.

I hope that the reader has noticed various ambiguities in the first paragraph and I hasten to straighten them out. I shall use in this paper the term 'sentence' in its traditional grammatical connotation, so that (2), for instance, will be regarded as a full-grown sentence rather than a mere abbreviation of a sentence, as modern logicians like to have it. And, secondly, I have, of

course, to introduce immediately the now well-known type-token terminology with respect to the various usages of 'sentence'. Using this terminology, we may say that all the tokens of the sentence-type (1) will be understood by almost every grown-up English-speaking person to refer to the same state of affairs, whereas nothing of this kind can be said with respect to the tokens of (2) and (3).

Assuming this to be the case, we are entitled, according to a common and extremely important procedure, to abstract from the pragmatic context of the production of the various tokens of (1) altogether and say that all the tokens of (1) have the same reference. Most people and many philosophers would even speak of the common reference of the sentence-type (1). I shall adhere – as I did already in the first paragraph – to this usage without any ontological commitments, *i.e.*, I am ready to regard it merely as a form of speech. In any case, I am for the moment completely uninterested in the ontological status of the references of sentences.

What is, however, important, for our purposes, is that not all the tokens of (2) have the same reference, though some of them may have, and that we are therefore not entitled to speak of *the* reference of (2) even as a form of speech. With respect to (3), we might even safely say that no two of its tokens have the same reference, since even if they are produced by the same person, say A, their production takes place at different times, say t_1 and t_2, so that one token will have the same reference as (any token of) 'A is hungry at t_1' (where 'is' is to be understood tenselessly) and the other token will have the same reference as 'A is hungry at t_2'.

It follows that the abstraction from the pragmatic context, which is precisely the step taken from descriptive pragmatics to descriptive semantics, is legitimate only when the pragmatic context is (more or less) irrelevant and defensible as a tentative step only when this context can be assumed to be irrelevant. It is, therefore, just a mistake to deal with references of the sentence-types (2), (3) and their like. Though denying a *reference* to type (2), we might still say it has a *meaning* in this sense that its various tokens may fulfil the same pragmatic function (or the same pragmatic functions), say to draw attention to certain meteorological conditions in the space-time neighbour-hoods of their producers (or in certain other specifiable neighbourhoods). It seems, however, advisable to avoid the overburdened term 'meaning' in this connexion, and I propose, therefore, to use instead the term *'function'* (as short for 'pragmatic function').

Similar things hold with respect to truth. Every token of (1) is true, and since all the tokens of (1) have the same reference, we may say in short that (1) is true. That the 'since'-clause in the former sentence is necessary is shown by

(4) I am producing now a sentence-token,

every token of which is true but which, nevertheless, cannot be regarded as true itself, since it does not refer to anything. (This "paradoxical" situation and

a similar one arising with respect to the next example (5) will be discussed somewhat fuller in section VIII.)

Not all (possible) tokens of (2) or (3) have the same truth-values; with respect to these types, it is even more obvious that it makes no sense to speak about their truth or falsity.

To simplify the terminology, I shall call a sentence-token which is either true or false a *statement*-token and its reference a *proposition*. If and only if each sentence-token of the same type has one and the same proposition as its reference, I shall call this type a statement(-type). According to this usage, only (1) will be a statement, but neither (2) nor (3) nor (4), though all tokens of these sentences are statements and all tokens of (4) even true statements.

This is a disquieting situation, though rather obvious and therefore often noticed. I have, nevertheless, the impression that its implications have not always been understood and its consequences not often been drawn and certainly not to a sufficient degree.

But before I proceed to draw what seems to me to be the necessary consequences of our insight, I should like to point out that the account given so far is still oversimplified to such a degree that obviously relevant factors have been left out. Is it, for instance, really the case that *all* tokens of type (3) are statements? Would we like to regard as a statement the utterance of such a token by an actor on the stage? Or the writing of another token of (3) in the sand of the desert by some strange play of the winds? I certainly would not, at least when the pragmatic context of the production of these tokens were known to me. For a sentence to be a statement, it has to fulfil certain syntactic and semantic conditions, but we see now that, in addition, its production has to fulfil certain pragmatic conditions, too, such as being produced by a conscious being having a certain "propositional attitude"; we shall not enter a discussion of the specific required conditions. We learn also from these situations that sometimes a sentence-token which is not meant by its producer to be a statement is understood so by a listener or reader, and we can, of course, very well imagine the opposite situation.

The extraordinary status of (4) is a bit shaken by these considerations, because now it turns out that not all imaginable tokens of this type are true, as we assumed before somewhat rashly. The situation is similar with respect to another "paradoxical" sentence-type

(5) I am dead.

It is, once again, not exactly the case that all tokens of this type are false, as has been assumed by some authors, though we might still say that all those tokens which are capable of being either true or false, the statements among them, cannot fail to be false.

One is, of course, entitled to introduce the additional pragmatic conditions into the definition of 'sentence' itself and to deny this predicate to patterns which "look like sentences" but the production of which does not fulfil the

mentioned conditions. Such patterns might then be called perhaps "sentence-like patterns". But I still would not agree to Gilbert Ryle's formulation[1] that an actor's utterance cannot be classified as either "use" or "mention". It is true that an actor does, in one important sense, neither use statements not state propositions, but he still uses sentences and perhaps even mentions propositions. In another sense, however, he even uses ("fictitious") statements and states ("fictitious") propositions.

These considerations make no difference with regard to sentence-type (3). It is not a statement, anyhow. But what with regard to (1)? We decided before to call it a statement, assuming that *all* its tokens have practically the same reference. But now we see that this is not the case – there might be some tokens of this type which have no reference at all, are not at all statements. Well, I still believe that it is advantageous to stick to our former decision. The cases where a token of (1) is not meant to be a statement are surely rather exceptional and anyhow completely harmless, since in these exceptional cases the tokens of (1) do not have a reference different from that possessed by the regularly produced tokens but no reference at all, and to abstract from them, therefore, is still in line with common scientific procedure. But let us not forget these exceptions, else we shall find ourselves sometimes confronting self-created pseudo-problems.

Another preliminary clarification has to be given to the term 'sentence-token'. I shall use it in such a way that a sentence-inscription, for instance, will be regarded as "the same token" during its whole life-time. More technically speaking, sameness of linguistic tokens will be defined by *genidentity*. Accordingly, we may say that many people read the same sentence-token, and this even at different times.

This procedure is by no means necessary, and it has rather awkward consequences, in certain cases. But other procedures will have their disadvantages, too, and it seems to me that for our investigation the decision chosen is the least evil.

II

Let us turn now to our main theme. Having grasped clearly that it is meaningless to speak about the truth, or even reference, of the sentence-type (3), a conviction we summarized in denying this type, and similar ones, the title 'statement', we may now ask about the reference and truth of a certain *token* of this type. To what, then, does a certain token of 'I am hungry' refer? To the fact that I am hungry? Is this token true if and only if I am hungry? Certainly not! Outrageous as this interpretation sounds, let us notice, in passing, that the truth of sentences of this kind does not fulfil the famous Leśniewski-Tarski

criterion of adequateness, at least not in its unsophisticated version which is meant to hold for statements of type (1). We may even turn the tables and safely declare that the inapplicability of this truth-criterion to a given sentence-type is a criterion that this type is not a statement.

What then, to ask the question again, does a certain token of (3) refer to? I hope that the reader is now ready to see that no categorical answer can be given to this question, so long as the pragmatic context of the production of this token is not known. Only when we know that it had been produced by B at time t_3, when he was fully conscious, not reciting a part of a play, etc., can we say that it refers to the same proposition as any token of 'B is hungry at t_3', a type of statements for which we assume that all questions of reference and truth are settled, so that this answer will satisfy us. Not knowing the pragmatic context, we can answer only hypothetically, with the help of a subjunctive conditional, "If this token had been produced by C at t_4, it would have meant that C is hungry at t_4", or using a general conditional, "For every person X and every time t, if X produces a token of the type 'I am hungry' at t (in an appropriate mood) this token refers to the proposition that X is hungry at t". And such a token of 'I am hungry' produced by X at t will be true if and only if X is hungry at t.

But I am not yet satisfied. I am afraid that certain modes of expression which I have used so far and which are in full accord with the common ways of argumentation are dangerously misleading and have, in fact, misled many philosophers. I refer to the expression 'a token of (3) has a definite reference in a certain pragmatic context', which may be paraphrased as 'a token of (3), as produced by C at t_4, refers to the proposition that C is hungry at t_4'. The adverbial clause 'in a certain pragmatic context', or the sentential clause 'as produced by C at t_4' are logical danger signals. They give the impression of being not too essential qualifications which cannot change the intrinsically dyadic relation of reference holding between a sentence-token and the proposition expressed by it. But this would be a mistake. Since the pragmatic context is essential and its omission leaves the token without reference, we have before us an essentially triadic relation between token, context, and proposition. We are entitled, of course, to analyse, for certain purposes, the context further into producer, recipient, the time of production, the place of production, etc., and get thereby polyadic relations with 4, 5, or more terms. And we are, of course, entitled, if we wish so for certain purposes, to reduce the triadic relation to a dyadic one, but – and this is the essential point – in this case the one member of the relation would not be any more the token itself, but the ordered pair consisting of the token and the context. Shifting the context to the other side of the relation, though formally completely correct, would be less in agreement with our usual linguistic habits and would anyhow change nothing at all.

There is nothing new in my point. It has been stressed often enough that it is not a sentence-token that refers to a proposition, but that it is a person who refers to something by this token (or a person-like machine, to keep up with the latest developments of communication-theory). And this is certainly true. But it is, on the other hand, also admissible and fruitful to speak about the reference of a sentence-token, if the context is irrelevant. And I am not sure whether this vital distinction, though nothing more than a restatement of the conditions which allow the transition from descriptive pragmatics to descriptive semantics, has always been fully understood.

The whole situation deserves more careful study with the help of an appropriate symbolism. Let me hint here at one possible start. Taking the triadic relation "(the sentence) a refers-pragmatically-to (the proposition) b in (the pragmatical context which includes also a reference to a language) c" as an undefined primitive concept – in symbols: $RP(a, b, c)$ – one could define "a refers-pragmatically-in-c-to b" – in symbols: $RP_c(a, b)$ – and "a-in-c refers-pragmatically-to b" – in symbols: $RP^+((a; c), b)$ – as being synonymous with it and then define 'refers-semantically' on the basis of one of these concepts, *e.g.* $RS(a, b) = df (c) (d) (RP(a, b, c) \equiv RP(a, b, d))$.

I propose not to assign reference and truth to sentence-tokens of type (2), (3), and their like, but only to a sentence-token-in-a-certain-context, *i.e.* to the ordered pair consisting of the sentence-token and its context. For the purpose of shorter expression, I shall call such a pair a *judgment*, thereby distilling a new sense out of this old-fashioned term. I hope the reader will carry in mind that, in this article, a judgment is neither the judged sentence-token nor the process of producing this token, but nothing more and nothing less than just the pair consisting of the token and the context.

By this proposal, I have reversed my former decision to call all tokens of (2) to (5), inclusive, statements. To leave no doubt open and to round off my terminology, I shall now make my final terminological proposals:

I shall use '*sentence*' (with respect to ordinary languages) as it is customarily used by grammarians.

Ordered pairs of sentences and contexts, of which truth or falsity may be predicated, will be called *judgments*.

The first component of a judgment will be called a *declarative sentence*.

A declarative sentence which paired with any context whatsoever forms judgments which refer always to the same proposition will be called a *statement*, otherwise an *indexical declarative sentence*, shortened to *indexical sentence* whenever misunderstandings will not be likely to arise.

The terms 'proposition', 'judgment', 'declarative sentence', 'statement', and 'indexical sentence' can be easily defined on the basis of the mentioned primitive triadic relation, its derivatives, and 'sentence'. One example will do for the purpose of illustration:

$$a \text{ is a statement} =_{df} (Eb)(RS(a, b)).$$

The distinction between 'indexical' and 'non-indexical' could, of course, be drawn also with respect to other types of sentences. "Close the door!" would be an indexical, "A to close the door d_1 at t_1!" a non-indexical command. But I shall limit my discussion to declarative sentences only.

All the definitions given refer, of course, to tokens only. The definitions of 'sentence-type' and 'statement-type' are obvious. And it clearly makes no sense to speak about 'judgment-types'.

According to these definitions, all the tokens of (1) and none of the tokens of (2) to (5), inclusive, will be statements, but the pairs of all of them with their pragmatic contexts will be judgments.

With respect to most artificial interpreted language-systems, our terms 'sentence', 'declarative sentence', and 'statement' coincide, whereas 'indexical sentence' is empty and 'judgment' unimportant. These systems have been constructed so that the pragmatic contexts of the production of their sentences is completely irrelevant. I believe that Carnap was the only major logician who mentioned this point explicitly, when he decided[2] to restrict his discussion of General Syntax to languages featuring this property only. He also drew the important distinction between two types of context-dependency (Carnap's own term is 'extra-syntactical dependence' which might be somewhat misleading outside the framework of Logical Syntax): an inessential one where the relevant context consists of preceding sentences only exemplified by "Yes" as an answer to "Does ice float on water?", where "Yes" is immediately replaceable by the statement (1); and an essential one, where the relevant context is extra-linguistic, which is much more interesting and therefore the main one discussed in this paper.

Owing to the restriction to non-indexical languages – voluntary and explicit with Carnap, unconscious with most other logicians – the tremendous development of Logical Syntax and Semantics in the last two decades has had only limited bearings on indexical languages, and no satisfactory *logic of judgments* has been proposed so far, although judgments with indexical components play an extremely important role both in common and in philosophical discourse. I have no statistics available, but I guess that more than 90 per cent, of the declarative sentence-tokens we produce during our life-time are indexical sentences and not statements; it is plain that most sentences with tensed verbs are indexical, not to mention all those sentences which contain expressions like 'I', 'you', 'here', 'there', 'now', 'yesterday' and 'this'.

What can be the explanation of this strange neglect of such very obvious traits of" ordinary languages? I venture the following hypothesis: Since a judgment with an indexical sentence as first component can always, without loss of information, be transformed into a judgment with a statement as a first component, keeping the second component intact, we might easily be tempted to drop the common phrase 'a judgment with . . . as first component' from both sides of this transformability statement and arrive at the result that any indexical sentence can be transformed into a statement, a patent falsity,

according to our former analysis. I guess that this illicit dropping is the main cause for the mentioned neglect, which is then in its turn the main cause for the grave mistakes made sometimes by good philosophers and logicians in the use and mention of indexical sentences.

Assuming that our psychological explanation holds for those cases in which treatment of the indexical traits of ordinary languages has been unconsciously neglected, we still have to face the deliberate neglect practised, for instance, by Carnap. I believe that the two main reasons behind his decision were: First, non-indexical languages are sufficient for the formulation of any given body of knowledge; second, the logic of non-indexical languages is complicated enough and should be developed before we proceed to deal with the incomparably more complicated logic of indexical languages. He was right in both reasons, in their time. But now, since the development of a satisfactory logic of non-indexical languages is well under way and since formulation of given bodies of knowledge is obviously not the only function of language, we cannot shun any more the more formidable task of analysing the complicated functioning of indexical expressions.

But is not the formulation I gave to the first reason weaker then necessary? Could we not assert much more, namely that non-indexical languages are sufficient for *every* communicative purpose? If this were true, if one could always express every cognitive content in a non-indexical language, the urgency of an investigation of the logic of indexical languages would be somewhat reduced, though it would still be of extreme importance for the analysis of common and philosophical discourse as it is historically given.

Let us try to answer this question with the help of the following *Gedanken-experiment*. Assume that Tom Brown is a logician interested in our problem who has decided to find out whether he could get along, for just one day, the first of January 1951, using the non-indexical part of ordinary English only. He told, of course, his wife about this experiment. At the morning of the mentioned day Tom awakes and since it is a holiday, he decides to have breakfast in his bed. His watch is under repair and he, therefore, does not know the time. How shall he inform his wife about his wish? He is forbidden to say 'I am hungry', but even 'Tom Brown (is) hungry on January 1st, 1951' will not do, since nothing in this sentence (though, of course, many things outside the sentence) indicates that he is hungry then, rather than that he has been hungry before or will be hungry in the afternoon. And he has told his wife to react only to the sentences themselves and to nothing else. Shall he say, then,

Tom Brown is hungry at the moment when Tom Brown utters this sentence-token?

Certainly not. He is not allowed to use 'this'. Well, then perhaps

Tom Brown is hungry at the moment when Tom Brown utters 'Tom Brown is hungry',

or, say,

Tom Brown is hungry at the moment when Tom Brown utters 'tweedledum',

or, even,

Tom Brown is hungry at the moment when a fly is sitting on his bed

will do? No, still not. There is nothing in the 'when'-clauses which ensures the uniqueness of the described situation, and Tom Brown, as a good logician, could not even use the definite article 'the' before 'moment'. Does there exist another uniqueness-ensuring 'when'-clause? Perhaps. I must admit that if I had been in his place, I would not have managed to make myself understood to my wife (or should I say 'to his wife'?) to the same degree as a simple 'I am hungry' would have done under ordinary circumstances. (This point should not be exaggerated. For successful communication it is not necessary that the event-class described in the 'when'-clause should be logically unique. A plausible empirical uniqueness will do in most cases. And it is a grave mistake to suppose that indexical expressions function always better in this respect. It is well known that many failures of communication are due to an excessive use of 'this'.)

But even if Tom Brown had a good watch and were able to say

Tom Brown is hungry on January 1st, 1951, at nine o'clock in the morning,

but his wife had none and no other means to check the time, he would have failed to communicate what he wanted to.

We see that effective communication by means of indexical sentences requires that the recipient should know the pragmatic context of the production of the indexical sentence-tokens. (Sometimes other contexts are relevant – but I shall waive their discussion.) To communicate the same amount of information by using non-indexical sentences only, knowledge of the context by the recipient is not required, but in its stead additional knowledge of some other kind may be necessary. Not in every actual communicative situation could every indexical sentence be replaced, without loss of information, by a non-indexical sentence; but there is, on the other hand, no indexical sentence which could not be replaced by a non-indexical sentence, without loss of information, in some suitable communicative situation.

Since our knowledge is limited, the use of indexical expressions seems therefore to be not only most convenient in very many situations – nobody would doubt this fact – but also indispensable for effective communication. Indexical language will continue to be used by scientists, philosophers, and everybody else alike. Recipients of indexical communication will not always be able to know its original context and hence not be able to find the statement to which the received sentence, paired with its context, is logically equivalent. Interesting and important problems with regard to successful or unsuccessful