[Revised July 1993 - Additions and substitutions in square brackets]

Conceptual Analysis 4: Definition-in-use and Verification Analysis

Definition-in-use

Having studied the various sentence frames in which the words or expressions connoting a given concept can and cannot meaningfully occur, the next step in a fully worked out analysis of a concept is to examine the logical relations of entailment, mutual contradiction and equivalence or synonymy which hold between sentences and propositions which fall under a sentence frame containing the concept under investigation and other sentences and propositions which do not contain this concept. The object of such an investigation is to develop what Ayer [in *Language, Truth and Logic* (Ayer, 1936/1946)] has called a *definition in use.*

In explaining what he means by a definition-in-use, Ayer contrasts this kind of definition with what he calls an *explicit definition* which is the kind of definition to be found in a dictionary or which is generated by

"the process of defining *per genus at differentiam*, to which Aristotelian logicians devote so much

attention." (*op. cit.* p. 60).

In an explicit definition, the definition consists of a word or expression which, if the definition is correct, is *synonymous* with the *definiendum*, where

"the word 'synonymous' is here used in such a way that two symbols belonging to the same

language can be said to be synonymous if, and only if, the simple substitution of one symbol for

the other, in any sentence in which either can significantly occur, always yields a new sentence

which is equivalent to the old." (*op. cit.* p. 60).

Earlier on the same page, Ayer explains what he means by saying that one sentence is equivalent to another:

"we say that two sentences of the same language are equivalent if, and only if, every sentence which

is entailed by any given group of sentences in conjunction with one of them is entailed by the same

group in conjunction with the other. And in this usage of the word 'entail,' a sentence *s* is said to entail a sentence *t* when the proposition expressed by *t* is deducible from the proposition expressed by *s*; while a proposition *p* is said to be deducible from, or to follow from, a proposition *q* ." (*op. cit.* p. 60).

According to Ayer,

"We define a symbol *in use*, not by saying that it is synonymous with some other symbol, but by showing how the sentences in which it can significantly occur can be translated into equivalent sentences, which contain neither the *definiendum* itself, nor any of its synonyms." (*op. cit.* p. 60).

This account of a definition-in-use is [unsatisfactory in that it fails to distinguish three cases:

1.   a case where the definition consists of a single sentence which is equivalent to the *definiendum* sentence,

2.   a case where the definition consists in a number of sentences each of which is equivalent to the *definiendum* sentence, and

3.   a case where the definition consists in a number of sentences which individually are *not* equivalent to the *definiendum* sentence, but which, when conjointly asserted, *are* equivalent to it.

It would be natural to assume that it is third of these options which Ayer has in mind, since it is only by, as it were, 'unpacking' the *definiendum* sentence into a number of constituent sentences which are jointly, but not individually, equivalent to it, that its meaning would, in some sense, be evidently elucidated. Moreover, it is difficult to see how the requirement that the equivalent sentences "contain neither the *definiendum* itself, nor any of its synonyms" can be satisfied in a case where the definition consists of a single sentence; unless that sentence consists in a conjunction of simpler sentences in which case it collapses into the third option. The second option is not a realistic contender, since in this case each of the constituent sentences would constitute a definition in the sense of the first option in its own right.

Unfortunately, Ayer's choice of examples (*op. cit.* pp.60-61) does nothing to clarify the matter. The examples are taken from Russell's (1919) "so-called theory of definite descriptions." Ayer states them as follows:

Definiendum	*Definition*
"The round square cannot exist."	"No one thing can be both round and square."
"The author of *Waverley* was Scotch."	"One person and one person only wrote *Waverley* and that person was Scotch."

Quite apart from the inaccuracy of Ayer's presentation of Russell's theory which he acknowledges in the Introduction added to the 1946 Edition of the book (*op. cit.*, pp. 22-24), these examples fail to perform their intended function for three reasons:

(a)   it is far from clear what word or expression is being defined (is the *definiendum*) in these examples; consequently,

(b)   it is far from clear that the requirement that the definition avoid the use of *definiendum* and its synonyms is being respected; it is arguable that in the first case 'can be' is a synonym of 'can exist', and in the second case that 'person who wrote' is a synonym of 'author' (assuming, of course, that it is the expressions 'can exist' and 'author' which constitute the respective *definienda* in the two cases);

(c)   it is not clear whether we are to regard the definitions in the two cases as a single sentence or as a conjunction/disjunction of two different sentences, viz.:

"No one thing can be both round and square."	For any *X*, either '*X* is round' is true and '*X* is square' is false, or '*X* is round' is false and '*X* is square' is true, or '*X* is round' is false and '*X* is square' is false.
"One person and one person only wrote *Waverley* and that person was Scotch."	For the same *X*, '*X* wrote *Waverley*' is true, and '*X* is Scotch' is true.]

I conclude, therefore, not only that we have not yet been supplied with an example of a definition in use, but also that the distinction that Ayer draws between an explicit definition and a definition in use is simply a matter of the way the definition is formulated. Moreover, the only reason for preferring the definition-in-use to the explicit definition is that, as Ayer himself recognizes, the synonymy of expressions has to be defined in terms of the equivalence of sentences that contain them. Consequently a

definition-in-use in which such sentences are formulated and their entailments examined and tested provides an extremely valuable, if not indispensable, check on the claim that the words or expressions given in the explicit definition are in fact synonymous.

Before proceeding to give my own, [I hope, rather better] example of a definition-in-use, I propose to define rather more precisely what I understand by such a definition. A definition-in-use, as I shall use the term, begins with a typical sentence frame, preferably one which expresses a particular existential proposition referring or capable of referring to a particular object, occurrence or state of affairs, employing what I have called the basic form of the concept in question. This sentence or sentence frame is then analyzed into at least two, and usually more, constituent sentences each of which expresses a proposition which is logically independent of the propositions expressed by the other constituents items that go to make up the analysis, in the sense that it does not entail and is not entailed by them, but which *is* entailed by the *analysandum* or *definiendum* sentence. Such a definition or analysis is only complete in so far as the joint assertion of all the propositions constituting the analysis or definition is equivalent to the assertion of the proposition expressed by the *definiendum* sentence.

[Applying Ayer's account of what it is for one sentence to be equivalent to another, as quoted above, to the case where a *definiendum* sentence is equivalent to the set of propositions constituting its definition-in-use, this means that, just as each of the sentences constituting the definition is entailed by the *definiendum* sentence, so the joint assertion of *all* the sentences contained in the definition will, if the definition is complete entail the *definiendum* sentence. Thus, using the sign $\rightarrow$ to stand for the relation of *entailment* and the sign $\tilde{\ }$ as a sign of negation, we can give a symbolic specification of the conditions which must be satisfied if the propositions q, r and s are to constitute a definition-in-use of another proposition p as follows:

A proposition p is equivalent to the conjoint assertion of the propositions q, r and s which together constitute its definitio-in-use, i. e., $p = (q \& r \& s)$, if and only if

1. p entails q, r and s, i. e., $p \rightarrow q$, $p \rightarrow r$, $p \rightarrow s$,

2. p, q, r and s are otherwise logically independent, i. e., $\tilde{\ }(q \rightarrow p) \& \tilde{\ }(q \rightarrow r) \& \tilde{\ }(q \rightarrow s) \& \tilde{\ }(r \rightarrow p) \& \tilde{\ }(r \rightarrow q) \& \tilde{\ }(r \rightarrow s) \& \tilde{\ }(s \rightarrow p) \& \tilde{\ }(s \rightarrow q) \& \tilde{\ }(s \rightarrow r)$,

3.   *q*, *r* and *s* jointly entail *p*, i. e., $(q \& r \& s) \rightarrow p.$]

Entailment and the entailment test

It is evident from this that in order to satisfy ourselves of the correctness of any purported definition-in-use, we have to be able to show that certain propositions either entail or do not entail certain other propositions. It is, therefore, essential that we should both understand what it means for one proposition to entail another and have some reliable means of demonstrating the existence or non-existence of such a relationship between two propositions.

As Ayer maintains in the passage quoted above, one proposition or set of propositions is said to entail another proposition, if (a) the proposition entailed follows from, or can be inferred as a direct logical consequence of the assertion of the proposition or propositions which entail it and, if (b) the entailed proposition cannot be denied without contradicting the entailing proposition. In symbolic terms $p \rightarrow q\ = \tilde{}\ (p \& \tilde{}\ q)$ or to put it another way $p \rightarrow q\ = (\tilde{}\ p \vee q)$ where $\vee$ stands for the exclusive disjunctive (`either..., or....').

In many cases of entailment, the propositions entailed, or 'the conclusion,' as it is usually called, is inferred from or entailed by the joint assertion of a number of propositions known as premises; and in this kind of case, the conclusion tends to follow by virtue of purely formal logical features of the premises such as the logical operators 'not,' 'if then,' etc. which they contain or the particularity/generality of the quantification of the constituent concepts regardless of the sense of the concepts themselves and of the proposition as a whole. But in the case of the entailments in which we are primarily interested for purposes of conceptual analysis, the conclusion follows as a direct consequence of a single premise, as in the case where the proposition '*x* is red' entails the proposition '*x* is coloured.' In such a case we can say both that 'being coloured' is part of the meaning of 'being red' and that the proposition '*x* is coloured' is part of the analysis or part of the definition of '*x* is red.' The inference in such a case is guaranteed not, as is sometimes supposed, by a hidden premise of the form 'whatever is red is coloured,' which merely states, in the form of an analytic proposition, the conceptual relation between the concepts, but by the way the two concepts 'red' and 'coloured' are employed in ordinary language.

There are, of course, many single premise inferences which we ordinarily draw, which *do* depend for their validity as strict deductive inferences on hidden unstated premises which are not, therefore, examples of such single premise entailments, e.g.: causal inferences like the inference from 'the light went on' to 'someone or something threw the switch.' Consequently we need some kind of test which enables us to discriminate between single premise inferences which depend upon a genuine entailment between the two propositions and single premise inferences which are not strict entailments and depend on other concealed premises. For this purpose the test which has been found useful, and which I call the *'entailment test,'* is the procedure whereby the premise is asserted and conjoined with a denial of the conclusion. If when this is done, the compound sentence so generated is manifestly self-contradictory, then we know that we are dealing with a genuine entailment. If no contradiction is generated, it follows that the premise does not entail the conclusion. Thus, whereas it is manifestly self-contradictory to assert 'x is red, but is not coloured,' it is not self-contradictory to assert 'the light came on, although no one and nothing threw the switch.'

An example of conceptual analysis by definition in use

As an exercise in the application of the above stated principles, you are asked to examine the following sample of a conceptual analysis by definition in use of the concept of visual perception, including sub-analyses of the subordinate concepts of 'looking at,' 'coming to know that,' 'knowing that,' and 'believing that.' Words and expressions for which a definition-in-use is provided are *in italics and* underline while words and expressions left undefined are *in italics* only.

Analysandum	*Analysis*
A. *X saw O* at time *t*.	1. *X* was *looking at O* at time *t* 2. *X came to know* [A2] that *O* was in *X*'s *field of view* at time *t* 3. If *X* had not been *looking at* [A1] *O* at time *t*, *X* would not have *came to know* [A2] that *O* was in *X*'s *field of view* at time *t*
A1. *X* was *looking at O* at time *t*	a. *X*'s eyes were open at time *t* b. *O* was in the *field of view* of *X*'s eyes at time *t* c. *X* was having, a particular *visual experience* at time *t*. d. If *X*'s eyes had not been open and if *O* had not been in the field of view of *X*'s eyes at time *t*, *X* would

	not have been having the particular visual experience X was having at time t.
A2. X _came to know_ that O was in X's _field of view_ at tine t	a. Before time t, X did not _know that_ [A2b] O was in X's _field of view_ b. X _knew that_ [A2b] O was in X's _field of view_ at time t c. (?) For a period of time after time t, X _knew (remembered) that_ O had been in X's _field of view_ at time t.
A2b. X _knew that_ O was in X's _field of view_ at time t	I. X _believed that_ [A2bI] O was in X's _field of view_ at time t. II. O was in X's field-of-view at time t. III. If O had not been in X's field of view at time t, X would not have come to believe that O was in X's _field of view_ at time t
A2bI. X _believed that_ O was in X's _field of view_ at time t	α. If X had been asked an appropriate question at time t, X would have said that O was in X's field-of-view at time t β. If X had _intended_ to φ at time t, such that X _believed that_ [A2bI] the absence of O in X's _immediate vicinity_ was the only condition _preventing_ X from φ-ing, X would have _tried_ to φ at time t.

Verification (Operational) Analysis and the Verification Principle

An important difference between conceptual analysis by definition-in-use and the analysis of concepts by sentence frame analysis, such as we were considering in the previous lecture, is that whereas the sentences frame analysis technique can be applied to any concept for which there is a word or expression in the language, definition in use necessarily presupposes the existence of certain concepts in the language which are both undefined and undefinable, since to define them would be to contravene the principle whereby a definition must, as Ayer puts it (*op. cit.* p. 60), "contain neither the *definiendum* itself, nor any of its synonyms." Experience has shown, moreover, that there are many other concepts, besides the fundamental elementary concepts in terms of which other concepts are defined, which are not susceptible to analysis, either by "explicit definition" or by "definition in use" in the sense in which Ayer uses those terms. But in those cases where no definition-in-use can be given, it is often possible to specify the meaning or sense of a word or expression by specifying the procedure whereby the truth of a particular empirical proposition containing the concept in question is established or confirmed. This is the technique known as *verification analysis* or *operational definition*.

For example, it is arguable that the definition of the sentence frame '*X believes that* O was in *X*'s field of view at time *t*' given under A2bI above is really a verification analysis or operational definition rather than a genuine definition-in-use and that the verb 'to believe that' is strictly speaking an undefinable concept in the formal sense of definition. Another example of verification analysis in the case of a concept which is formally undefinable is Russell's (1905) analysis of the concept 'average man' when he says the sentences *The average man has two and a half children* is translatable by a sentence describing a statistical operation whereby the number of children in a given population is calculated and the number of men who either are or potentially could be fathers of those children is likewise calculated and the second number is divided into the first yielding the number 2 ½.

Although, as is illustrated by this example from Russell, the technique of verification analysis is older than the verification principle, the technique of verification analysis or operational definition was given particular prominence as a result of the advocacy of the so-called *verification principle* by the *logical positivists* in the 1930's. According to the verification principle, the meaning of an empirical statement is its method of verification. The principle has three main consequences, all of which have been exploited at one time or another by philosophers in the logico-linguistic tradition:

1. any putative statement, which is not a necessary truth, but for which no verification procedure can be specified is '*ipso facto*' meaningless and hence not a genuine statement or proposition;

2. the meaning of any indicative sentence which does not express a necessary truth, but which *does* express a genuine proposition, can be specified by describing the procedure required in order to verify it;

3. if two different procedures are required in order to determine the truth or falsity of the propositions expressed by two different sentences in which the same word or expression is predicated of the same subject term, the word or expression must mean two different things and hence connote two different concepts in the two cases.

The first of these applications of the verification principle was originally used as a means of dismissing as unworthy or further consideration such things as theology, speculative metaphysics and ideology. It was also used particularly in its later Popperian or falsificationist form (Popper 1934/1959;

1963) as a device for dismissing, as unscientific, such would-be scientific theories as psychoanalysis. The second application provides the basis not only for the use of verification analyses in elucidating the concepts of ordinary language, but also for Bridgman's (1928) operationalism whereby scientific concepts are defined in terms of the procedures used to determine their application in a given case. The third application is illustrated by the use that Malcolm (1959) makes of it in his well-known analysis of the concept of dreaming. As Putnam (1962) has shown, Malcolm's book provides the complete *reductio ad absurdam* of the verification principle which, if taken literally, would imply that because the procedure for verifying the statement *Caesar crossed the Rubicon in 50 B.C.* is quite different from the procedure for verifying the statement *Caesar is just now crossing the Rubicon* made by someone at the time, the expression *crossing the Rubicon* means two quite different things in the two sentences. The right conclusion seems to be that, as a devise for dismissing theology, speculative metaphysics, ideology and scientific theories like psychoanalysis, the verification principle is redundant. For, if there is no way of determining the truth or falsity of a proposition or theory, there can be no reason, in the logical sense, to accept it as true. To describe it as meaningless is merely to add insult to injury. As a principle to be applied in defining all scientific concepts, it has the grave disadvantage of ruling out the use of theoretical concepts referring to unobservable features of the universe which have repeatedly proved the utility in scientific research; while as means of distinguishing different senses of a word or expression it reduces, as we have seen, to absurdity.

It is said that Schlick's (1930) original adaptation of the verification principle followed a remark made to him by Wittgenstein in which Wittgenstein suggested that, in analysing a proposition, it is always helpful to consider what one would have to do in order to verify the proposition in question. Taken in this, the original Wittgenstein, way, as a heuristic device for throwing light on the meaning of sentences and the concepts they express, and, in scientific contexts, as a device for ensuring that theoretical statements have testable empirical consequences, the verification principle is extremely valuable.

In the field of philosophical psychology, if we ask how we verify statements containing different psychological predicates, we find, as Ryle (1949) has shown, that there are some psychological predicates like 'knowing,' 'understanding,' 'being intelligent,' or 'being vain' where the decision as to whether or not

the predicate applies in a given case is made not by the individual of whom it is predicated, but by an independent observer who bases his conclusions on the objectively observable behaviour and performance of the individual in question. On the other hand we also find other psychological predicates like believing, thinking, dreaming, feeling, experiencing, having pains or other forms of sensation, where we depend on what the individual himself says in order to ascribe these predicates to him and where we can only refuse to accept what he says by accusing him of lying; for these are matters on which for some reason he cannot be mistaken. This is, of course, the traditional problem of mental self-knowledge or introspection, as it used to be called. It is a problem to which we shall have to return in Section 5 of this course of lectures.

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