

## Philosophy 5340 – Epistemology

### Topic 3: Analysis, Analytically Basic Concepts, Direct Acquaintance, and Theoretical Terms

#### Part 2: Theoretical Terms

#### 1. What Apparatus Is Available for Carrying out Analyses?

##### 1.1 A Preliminary Attempt to Answer this Question

A natural view is that if a term or concept is to be analyzable, it must be analyzable in terms of basic descriptive concepts or terms, together with acceptable logical apparatus. As regards the former, the following view seems plausible:

**(BDT) Basic descriptive concepts or terms:** These concepts or terms pick out properties or relations to which one can have some type of immediate access, where immediate access to a property or relation is either a matter of immediate perception, or, and more plausibly, direct awareness, or, and in my opinion more plausibly still, direct acquaintance. Or, alternatively, one might characterize basic concepts or terms as ones that cannot be verbally defined.

The next question is then: What **logical apparatus** can one employ?

In response, it is surely legitimate to use the following:

**(LG1) Logical Apparatus 1:** The truth-functional, propositional (or sentential) connectives: and, or, not, if ... then, etc.

**(LG2) Logical Apparatus 2:** Quantification over **particulars**: the universal quantifier – for all  $x$  – and the existential quantifier – there is an  $x$ .

##### Comments

1. Logical apparatus of type 2 was not available in full form to traditional empiricists such as Locke, Berkeley, and Hume, nor to Kant, since while Aristotle, around 300 BC, had studied in a detailed way arguments involving statements containing the terms "all", "some", and "none", a satisfactory account of such terms did not emerge until the work of Gottlob Frege (1848-1925), who, with the publication of his *Begriffsschrift* in 1879 produced "the first really comprehensive system of formal logic,"<sup>1</sup> and a system that went far beyond Aristotle's syllogistic logic.

2. Here are two simple examples involving logical apparatus of type 2:

" $x$  is a planet" = def. "There exists a  $y$  such that  $x$  orbits about  $y$ , and is held in orbit by a force that  $y$  exerts on  $x$ ."

" $x$  is an uncle" = def. "There exists a  $y$  and there exists a  $z$  such that  $x$  is a brother of  $y$ , and  $y$  is a parent of  $z$ ".

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<sup>1</sup> William Kneale and Martha Kneale, *The Development of Logic* (Oxford: Clarendon Press, 1962), p. 510.

3. It is important to note that the quantification involved here is quantification over particulars, and not over properties or relations.

## 1.2 Is the Above Apparatus Adequate?

Does the combination of basic descriptive terms, plus logical apparatus of types 1 and 2 suffice to enable one to analyze any term that cannot be taken as analytically basic?

One way of seeing that more may be needed is by considering dispositional terms. In particular, consider the expression "water-soluble". It seems plausible to say that if one knows what it is for something to be water, and what it is for one thing to be in another thing, and, finally, what it is for something to be dissolving, shouldn't one then be able to understand what it is for something to be water-soluble?

But let us try carrying out the analysis using only those terms, plus logical apparatus of types 1 and 2. A natural try is this:

"A is water-soluble at time  $t$ " = def. "If A is in water at time  $t$ , then A is dissolving at time  $t$ "  
 - where the "If ... then ---" connective is the material conditional.

Since "If ... then ---" statements so interpreted can be analyzed as follows:

"if  $p$  then  $q$ " = def. "Either not  $p$  or  $q$ "

such statements are true if either the antecedent is false or the consequent is true. Accordingly, the suggested analysis, while it entails that a sugar cube that is not in water at time  $t$  is water-soluble at time  $t$ , will also entail that a piece of chalk that is not in water at time  $t$  is also water-soluble at time  $t$ . So an analysis of the concept of water-solubility using a material conditional, in the way just considered, doesn't work.

It might be, of course, that some more complicated analysis using only logical apparatus of types 1 and 2 would succeed. But rather than pursuing that question, let us consider alternative approaches.

## 1.3 Alternative Analyses of Water-Solubility?

One natural response to the problem that arises when one attempts to analyze the concept of water-solubility using the material conditional is to switch to a different sort of "if ... then ---", namely the subjunctive conditional. Then one has instead the following analysis:

"A is water-soluble at time  $t$ " = def. "If A **were** in water at time  $t$ , then A **would be** dissolving at time  $t$ "

This analysis enables one to avoid the earlier objection, since according to this revised definition, a piece of sugar that is not in water will be water-soluble, whereas a piece of chalk that is not in water will not be water-soluble.

The question that immediately arises, however, is whether one can add a **subjunctive conditional connective** to one's list of acceptable logical apparatus. Can this connective be taken as basic, or do we need to offer an account of the truth conditions of sentences that involve subjunctive conditional connectives?

Most philosophers think that one needs to give an account of the truth conditions of sentences involving subjunctive conditional connectives – what are often referred to as "**counterfactuals**". But rather than pursuing this issue, let us consider a different approach to explaining what it is for something to be water-soluble, an approach that will enable us to understand the central ideas involved in **theoretical term analyses**.

#### 1.4 A Theoretical Term Analysis of Water-Solubility

The alternative approach emerges if one considers what answer might be given if one asked a physicist or a chemist what water-solubility is. They would tend to refer to **certain specific properties** of water molecules, and of the molecules of substances – such as sugar and salt – that are water-soluble, and then they would explain how the combination of the relevant property of water molecules together with the property of the water-soluble molecule **brings it about** that water-soluble substances dissolve when placed in water.

Now the account that physicists and chemists would offer does not capture, of course, what it is that ordinary people mean when they say that sugar is water-soluble, since ordinary people have no knowledge of the specific properties involved. But the idea behind a theoretical term analysis of water-solubility is that one can modify the scientific account of water solubility by dropping the reference to **specific** properties. So consider, in particular, the following proposed analysis:

"A is water-soluble at time  $t$ " = def. "**There is some property,  $P$** , such that, first,  $A$  has property  $P$  at time  $t$ , and secondly, for any  $x$ , and any time  $t^*$ , if  $x$  has property  $P$ , at time  $t^*$  and  $x$  is in water at time  $t^*$ , then the combination of those two states of affairs **causes**  $x$  to dissolve for at least a short interval just after time  $t^*$ "

There are three important, new elements that enter into this analysis:

- (1) There is the general concept of **a property**;
- (2) There is **quantification that ranges over properties**, rather than over particulars;
- (3) There is the concept of **causation**.

The presence of these elements suggests, first, that one add one further type of logical apparatus:

**(LG3) Logical Apparatus 3:** Quantification over **properties and relations**, rather than over particulars: the universal quantifier – for all  $P$  – and the existential quantifier – there is a  $P$ .

In addition, it seems that one should add certain very general terms that are often referred to as "quasi-logical" terms, or "topic neutral" terms – such as "property", "relation", "state of affairs", "event", "thing", "entity", and so on. So we have:

**(QLV) Quasi-Logical Vocabulary:** "property", "relation", "state of affairs", "event", "thing", "entity", etc.

Finally, it may appear that we may need some metaphysical terms and expressions, such as "cause", and – though this did not emerge in the preceding example – "law of nature". So one might also add:

**(MV) Metaphysical Vocabulary:** "cause", "law of nature"

But whether this final addition is to be accepted is much less clear than the other two additions, since accepting (MV) is to accept, in effect, the idea that the concepts of causation and of laws of nature are **analytically basic concepts**. Earlier, however, we saw that it was appealing to think that basic descriptive concepts – as contrasted with basic logical concepts – should be ones that pick out immediately given properties and relations, and if this is right, then neither the concept of causation nor the concept of a law of nature should be taken as analytically basic. As a consequence, it would seem preferable to offer analyses of the concept of causation and of the concept of a law of nature, rather than embracing (MV).

(\*) What accounts are to be given of the concept of causation, and of the concept of a law of nature?

## 2. Theoretical Term Analyses

### 2.1 The Logical Apparatus Involved

What apparatus can one employ in constructing analyses? The answer that I have suggested is that one can employ at least the following:

**(BDT) Basic descriptive concepts or terms:** These concepts or terms pick out properties or relations to which we can have some type of immediate access.

**(LG1) Logical Apparatus 1:** The truth-functional, propositional (or sentential) connectives: and, or, not, if ... then, etc.

**(LG2) Logical Apparatus 2:** Quantification over **particulars**: the universal quantifier – for all  $x$  – and the existential quantifier – there is an  $x$ .

**(LG3) Logical Apparatus 3:** Quantification over **properties and relations**, rather than over particulars: the universal quantifier – for all  $P$  – and the existential quantifier – there is a  $P$ .

**(QLV) Quasi-Logical Vocabulary:** “property”, “relation”, “state of affairs”, “event”, “thing”, “entity”, etc.

Given this list, one can now explain the difference between **reductive** analyses and **theoretical term** analyses: reductive analyses make use only of (BDT), (LG1), and (LG2); theoretical terms analyses, by contrast, make essential use of (LG3) and (QLV).

Why is this difference important? The answer is that because reductive analyses do not make use of quantifiers that range over properties and relations, the only properties and relations that reductive analyses can refer to are properties and relations with which one is directly acquainted, or directly aware of, together with logical constructions out of those properties and relations. Because of this, the truth of any statement that does not contain any theoretically defined terms must **logically supervene** upon facts about analytically basic properties and relations. By contrast, when one has a statement that contains at least one theoretically defined term, the truth-value of such a statement does not logically supervene simply upon facts about what things have various analytically basic properties and relations.

## 2.2 The Key Idea: A Relational Characterization of Properties and Relations

Another way of describing the difference is this. If analytically basic terms or concepts pick out properties or relations with which one is directly acquainted, or directly aware of, then it might be claimed that one has access to **the intrinsic nature** of such properties and relations. But then, given the logical apparatus that is involved in reductive analyses, it is plausible that one can have complete knowledge of the intrinsic nature of any properties or relations connected with such reductively defined terms. By contrast, once one makes use of quantifiers that range over properties and relations, including properties and relations with which one is not directly acquainted, one may have **no way at all of knowing about the intrinsic nature** of any properties or relations associated with theoretically defined terms. For what the logical apparatus of quantifying over properties and relations enables one to do is, in effect, to identify a property **simply by its relations to other things**.

Here is a simple illustration of theoretical definitions of the terms "mind" and "mental state", taken from David Armstrong's book *A Materialist Theory of the Mind*, page 79:

"As a first approximation, we can say that what we mean when we talk about the mind, or about particular mental processes, is nothing but the effect within a man of certain stimuli, and the cause within a man of certain responses. The intrinsic nature of these effects and causes is not something that is involved in the concept of the mind or the particular mental concepts. The concept of a mental state is the concept of that, whatever it may turn out to be, which is brought about in a man by certain stimuli and which in turn brings about certain responses."

As one can see, the idea is to characterize the mind, and particular mental states, simply in terms of their **relations** – and, especially, their causal relations – to other things – specifically, stimuli and behavioral responses. There is no reference to the intrinsic nature of the mind, or to the intrinsic natures of different mental states.

## 2.3 Two Types of Relational Characterizations

There are two different ways in which one might think that one can characterize properties and relations with which one is not directly acquainted, or of which one is not directly aware. One way is this:

### (1) Via Relations to *Known* Properties and Relations

Examples:

- (a) Redness is that property of physical objects that causes experiences with the property of qualitative redness
- (b) A functional characterization of **some** mental states by means of a theory that relates those states to mental states that one can be directly acquainted with, or directly aware of, in introspection. (Contrast, here, the functionalist account offered by Armstrong, in which one is not acquainted with the intrinsic nature of **any** property or relation.)

The second way is this:

**(2) Via the Location within a Set of *Unknown* Properties and Relations**

Here the idea is that one uses a theory that does not involve any observational properties or relations. Each property or relation is identified by virtue of its unique place within the specified causal or nomological network.

**A Potential Problem:** If a property is characterized only by its place in a theory **none** of whose properties or relations is observable, how can one ever have justified beliefs concerning the presence of that property?