

Corcoran, J. 2007. Conditions and Consequences. *American Philosophy: an Encyclopedia*. 2007. Eds. John Lachs and Robert Talisse. New York: Routledge. Pages 124-7.

In one of several senses, *conditions* are or resemble qualities, properties, features, characteristics, or attributes. Being equilateral and being equiangular are two *necessary* conditions for being a square. In order for a polygon to be a square, it is necessary for it to be equilateral—and it is necessary for it to be equiangular. Being a quadrangle that is both equilateral and equiangular is a *sufficient* condition for being a square. In order for a quadrangle to be a square, it is sufficient for it to be both equilateral and equiangular. Being equilateral and being equiangular are *separately necessary and jointly sufficient* conditions for a quadrangle to be a square. Every condition is both necessary and sufficient for itself. The relational phrases ‘is necessary for’ and ‘is sufficient for’ are often elliptical for ‘is a necessary condition for’ and ‘is a sufficient condition for’. These senses may be called *attributive*; other senses that may be called *instrumental* and *causal* are discussed below.

Every condition *applies to* everything that *satisfies* it. Every individual satisfies every condition that applies to it. The condition of being equilateral applies to every square, and every square satisfies the condition of being equilateral. The *satisfaction* relation relates individuals to conditions, and the *application* relation relates conditions to individuals. The *satisfaction* and *application* relations are converses of each other. *Necessity* and *sufficiency*, the relations expressed by ‘is a necessary condition for’ and ‘is a sufficient condition for’, relate conditions to conditions, and they are converses of each

other. Every condition necessary for a given condition is one that the given condition is sufficient for, and conversely.

In consequence of a chain of developments tracing back to Boole and De Morgan, it has become somewhat standard to limit the individuals pertinent to a given discussion. The collection of pertinent individuals is usually called *the universe of discourse*, an expression coined by Boole in 1854. In discussions of ordinary Euclidean plane geometry, for example, the universe of discourse can be taken to be the class of plane figures. Thus, squares are pertinent [individuals], but conditions, propositions, proofs, and geometers are not. Moreover, the collection of pertinent conditions is automatically limited to those coherently applicable to individuals in the universe of discourse. Thus, triangularity and circularity are pertinent [conditions], but truth, validity, rationality, bravery, and sincerity are not.

Some philosophers posit *universal* and *null* conditions. A universal condition *applies to or is satisfied by every pertinent individual*. A null condition *applies to or is satisfied by no pertinent individual*. In ordinary Euclidean plane geometry, the condition of being planar is universal and the condition of being round and square is null. Every figure satisfies the condition of being planar. No figure satisfies the condition of being round and square.

Some philosophers posit for each given condition a *complementary* condition that applies to a pertinent individual if and only if the individual does not satisfy the given condition.

In some of several senses, *consequence* is a relation between conditions. Being equilateral and being equiangular are two consequences of being square. In the sense

used here, given any two conditions, the first is a consequence of the second if and only if the second is a sufficient condition for the first. Equivalently, being a consequence of a given condition is coextensive with being a necessary condition for it. The relational verb ‘implies’ is frequently used for the converse of the relational verb phrase ‘is a consequence of’. Given any two conditions, the first implies the second if and only if the second is a consequence of the first. In the attributive senses under discussion, a consequence of a condition can not be said to be a result of the condition nor can the condition be said to be a cause of its consequences. It would be incoherent to say that being equilateral is caused by being square.

There are *reflexive* and non-reflexive senses of ‘consequence’ applicable to conditions. Both are useful. In the reflexive senses, which are used in this article, every condition is a consequence of itself. In the non-reflexive senses, which are not used in this article, no condition is a consequence of itself.

There are material, intensional, and logical senses of ‘consequence’ applicable to conditions. All are useful. Because of space limitations, in this article, only material consequence is used although the other two are also described.

Given any two conditions, the first is a *material consequence* of (is *materially implied by*) the second if and only if every individual that satisfies the second satisfies the first. Being equilateral is a material consequence of being an equiangular triangle, but not of being an equiangular quadrangle. As is evident, material consequence is entirely *extensional* in the sense that whether one given condition is a material consequence of another is determined by their two *extensions*, the collections of individuals that satisfy them. Given any two conditions, the first is an *intensional consequence* of (is

intensionally implied by) the second if and only if the proposition that every individual that satisfies the second satisfies the first is analytic or intensionally true. Being equal-sided is an intensional consequence of being an equilateral triangle. Given any two conditions, the first is a *logical consequence* of (is *logically implied by*) the second if and only if the proposition that every individual that satisfies the second satisfies the first is tautological or logically true. Being equilateral is a logical consequence of being an equilateral triangle.

Besides the one-place conditions – such as being three-sided or being equilateral – that are satisfied or not by a given individual, there are two-place conditions – such as being equal-to or being part-of – that relate or do not relate one given individual to another. There are three-place conditions such as numerical betweenness as in “two is between one and three”. Given any three numbers, in order for the first to satisfy the betweenness condition with respect to the second and third, it is necessary and sufficient for either the second to precede the first and the third the second or the second to precede the third and the first the second. There are four-place conditions such as numerical proportionality as in “one is to two as three is to six”. Given any four numbers, in order for the first to satisfy the proportionality condition with respect to the second, third, and fourth, it is necessary and sufficient that the first be to the second as the third is to the fourth. C. S. Peirce (1992, 225-228) discussed polyadic or multi-place conditions as early as 1885.

There are many debated philosophical issues concerning conditions and consequences. Traditional philosophers ask ontological and epistemological questions about conditions. What are conditions? Do they change? Do they exist apart from the

entities satisfying them? How do we know of them? How are propositions about them known to be true or to be false? In view of modern focus on identity criteria, philosophers now want to ask the questions involving them. One such ontological question asks for an identity criterion for conditions: what is a necessary and sufficient condition for “two” conditions to be identical? The widely accepted identity criterion for extensions of conditions is that given any two conditions, in order for the extension of the first to be [identical to] that of the second, it is necessary and sufficient for the two conditions to be satisfied by the same entities.

There are questions concerning the ontological status of conditions. Are conditions mental, material, ideal, linguistic, or social, or do they have some other character? What is the relation of conditions to properties? A given individual satisfies (or fulfills) a given condition if and only if the condition applies to the individual. A given individual has (or possesses) a given property if and only if the property belongs to the individual. Are the last two sentences simply translations of each other?

Philosophical terminology is not uniform. Before any of the above questions can be fully meaningful, it is necessary to interpret them or to locate them in the context of the work of an individual philosopher. We should never ask an abstract question such as what it means to say that something satisfies a condition. Rather we should ask a more specific question such as what Peirce meant by saying that accuracy of speech is an important condition of accurate thinking.

John Dewey’s voluminous writings provide a rich source of different senses for the words ‘condition’ and ‘consequence’. Except where explicitly noted, all references to

Dewey are by volume number and page in the Southern Illinois UP critical edition. Thus, (12, 454) is page 454 of volume 12.

It would be useful to catalogue the various senses Dewey attaches to ‘condition’ and ‘consequence’ the way that A.O. Lovejoy famously catalogued senses of ‘pragmatism’. In several passages, Dewey links a sense of ‘condition’ with a corresponding sense of ‘consequence’ just as senses of these words were linked above. Two corresponding usages occur repeatedly in his writings and, it should be said, in most writings concerned with human activity including government and technology. In one, condition/consequence is somewhat analogous to means/end. In fact, Dewey sometimes uses the words ‘condition’ and ‘means’ almost interchangeably as in his famous pronouncement (12, 454): “Every intelligent act involves selection of certain things as means to other things as their consequences”. A little later, he adds (12, 455): “... in all inquiries in which there is an end in view (consequences to be brought into existence) there is a selective ordering of existing conditions as means ...”. In the other sense, condition/consequence is similar to cause/effect – although identification is probably not warranted in either case. Dewey studiously avoids sharp distinctions, dualisms, dichotomies, and other artificialities. There are passages where both contrasts are relevant, but as far as I know, Dewey never explicitly notes that ‘condition/consequence’ was used for both.

The means/end sense occurs, for example, in his 1945 *Journal of Philosophy* article, “Ethical Subject-Matter and Language” (15, 139), where he suggested that the inquiry into “conditions and consequences” should draw upon the whole knowledge of relevant fact. The cause/effect sense occurs on page 543 in his response to critics in the

1939 Library of Living Philosophers volume. Here he wrote: “Correlation between changes that form conditions of desires, etc., and changes that form their consequences when acted upon have the same standing and function ... that physical objects have ...” There are scattered passages suggesting that Dewey regarded the means/end relation as one kind of cause/effect relation. In fact he regards a causal proposition as one “whose content is a relation of conditions that are means to other conditions that are consequences” (12, 455).

In some of the senses Dewey uses, *conditions* are or resemble qualities, properties, features, characteristics, or attributes. These senses were referred to above as *attributive*. However, in the two of senses in question, the *instrumental* sense and the *causal* sense, let us say, *conditions* are or resemble states or events more than qualities, properties, features, characteristics, or attributes. After all, the attributive condition of being equiangular, which is a consequence of the condition of being an equilateral triangle, could hardly be said to be brought about through use of the latter as means or said to be caused by the latter. Accordingly, an attributive condition is neither earlier nor later than its consequences, whereas an instrumental or causal condition necessarily precedes its consequences. As Dewey (12, 454) himself puts it, “The import of the causal relation as one of means-consequences is thus prospective”.

From a practical point of view, Dewey’s causal and instrumental senses of ‘condition’ and ‘consequence’ are at least as important as the attributive senses. In the causal sense, fuel, oxygen, and ignition are conditions for combustion as a consequence. In the instrumental sense, understanding, evidence, and judgment are conditions for knowledge as a consequence.

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