A Tripartite Theory of 'Definition'

Abstract: This essay analyzes the nature of 'definition' as a definiendum-to-definiens relationship. A 'tripartite theory' of definition is hypothesized. It states that whenever a person defines a definiendum-to-a-definiens, that person can only be interpreted as asserting either a 'reportive definition,' a 'theoretic definition,' or a 'stipulative definition.' In order to verify the truth of the tripartite theory of definition, a conceptual investigation about the functional use of definitions in various situations is described by examples. Of special interest and importance are the examples of stipulative definitions. As a mathematical anti-realist, I contend that formal systems are wholly composed of stipulative definitions, and that knowledge about the kinds of stipulative definitions is crucial for understanding mathematical anti-realism. Of course, an anti-realist mathematical theory isn't presented here. To back up the tripartite theory, I comment on entries about ‘definition’ from The Cambridge Dictionary of Philosophy Audi (1999).

Introduction

With a tripartite theory of definition, I hypothesize that whenever a person asserts how a linguistic entity (i.e. word, phrase, symbol, definiendum) has been used, is used, or is going to be used; that person can only be interpreted as asserting a reportive (i.e. lexical) definition, theoretic definition, or a stipulative definition. If this hypothesis is true, we should be able to understand any definition of a definiendum-to-definiens form (in a context) as being one of these three types. If this hypothesis is false, we should be able to find an instance of a linguistic token-to-meaning form that cannot be interpreted as reportive, theoretic, or stipulative. The tripartite theory is not an a priori truth; it is a social scientific conceptual truth that could be disconfirmed with counter examples.
The methodology of this essay is that of conceptual analysis. With this method, we will evaluate a theory of 'definition' as a 'best-explanation inference' about the nature and functional use of this concept. Possessing a concept (such as that of the concept of 'definition') makes one disposed to have beliefs (or intuitions) about the correct application of the concept in various cases. With conceptual analysis, participants are asked to critically assess their conceptual intuitions (which are subject to clarification). We are concerned with functional explanations and hypotheses about how natural and artificial languages are used and the intentions of users.

What is a 'definition' as a definiendum-to-definiens relationship? To guide our pre-theoretic intuitions, let's start out with a question. Each of the seven assertions below is an example of a definition. True or false?

1) 'Knowledge' means 'cognition, or the fact of knowing something through acquaintance, or range of one's information or understanding, or the sum total of truth, information, and principles acquired by humankind.' (Source: A standard dictionary).

2) 'Water' means 'a clear liquid that falls as rain, and makes up streams, lakes, and seas, and is composed of H2O.' (Source: A man on the street).

3) 'Knowledge' (i.e. for a person S to know p) means that '1) p is true, 2) S believes p, 3) S believes p upon a set of premises that are relevant for why p should be believed, and 4) there exists no unresolved nor unconsidered undermining evidence that would effectively lead S to doubt or disbelieve p.' (Source: A philosopher).
4) 'Water' means 'a substance composed of H2O, which freezes at zero degrees centigrade, and has a high maximum density at 4 degrees centigrade, and a high specific heat.' (Source: A physical scientist).

5) I shall at this moment name my new puppy 'Spot.' (Source: A dog owner declaring the name of her new puppy).

6) In the remainder of this essay, I abbreviate 'trigeminal neuralgia' as 'TN.' (Source: An article about nerve disorders. The author proposes a short symbol for a long symbol to save space and for easier reading).

7) A person is 'tall' if he or she is 6 feet in height or greater. (Source: A person evaluating how many tall people are playing in a high school basketball league).

I hope the reader has responded 'true' to the above question. In each case, a linguistic expression is the subject of the sentence (the definiendum) such that its relationship to a definiens that already has a meaning (i.e. an intelligibility) is precisely specified.

**Part I: A Tripartite Theory of Definition**

These examples serve as a guide to the theory of definition hypothesized here. A 'definition' is a sentence that connects a mark or a sound (i.e. a definiendum) to a meaningful definiens in the context of one of the following three functions:

1) A **reportive definition** (or 'lexical definition,' 'nominal definition') reports or describes the generally accepted or community equivalence between a definiendum and a definiens. A reportive definition is correct (i.e. true) if its definiens is an accurate report of the usual sense(s) of a definiendum. A standard dictionary contains reportive definitions.
2) A *theoretic definition* (or 'real definition,' 'natural definition,') affirms the standard equivalence between a definiendum and a definiens, but represents an attempt to analyze the 'nature' or 'associated material conditions' of the entity being discussed. Entities designated by a theoretic definition are assumed to have a self-unity, or an independent nature that allows them to have essential properties to be the subject of analysis. In physical science, objects such as water, acid, gold, kinetic energy, electron, gene, protein, enzyme, animal species, and plant species are often thought to belong to 'natural kind' categories. In Philosophy, the concepts of knowledge, truth, justification, mentality, cause, law, necessity, identity, explanation, freedom, beauty, goodness, piety, justice, and existence have often been treated as having an objective nature, and capable of theoretic definition. A theoretic definition is correct (i.e. true) if its definiens truly describes instances of the object being defined. Attention to evidence, reasons, and arguments is required to establish the truth of a theoretic definition.

3) A *stipulative definition* introduces a specialized definiens for a definiendum. This occurs in the following three contexts: (a) the initial naming of an entity where the entity is newly-discovered, newly-introduced, newly-created, or newly-renamed, or (b) in the notational abbreviation of one linguistic expression for another (meaningful) linguistic expression, or (c) in a precise formalization where a reportive definiendum-to-definiens relation is generally affirmed but a definiens alteration (or explication) is proposed for pragmatic, technical, or personal reasons.
The evidential support for the tripartite theory of definition is based upon the observations of speech and writing patterns found in natural and artificial languages. The theory should account for definitions that are found in physical science, mathematics, and elsewhere. All other kinds of definitions (e.g. analytic, ostensive, real, nominal, synonymous, recursive, explicit, implicit, precising, persuasive, operational, essential, disjunctive, verbal, conventional, intensional, extensional, contextual, explicative, functional, conditional, impredicative, partial, axiomatic, constructive, procedural, direct, legislative, discursive, etc.) should be identical to, fall under, be explainable, or refutable under these three primary types. This theory is a hypothesis about the actual limits (and modes) of how persons can intelligibly specify their use of a linguistic symbol. Its very simplicity may raise doubts. The tripartite theory is similar to those found in the elementary logic books of Irving Copi & Carl Cohen (2005) and Patrick Hurley (2009).

Although there is an ancient distinction between so-called 'real' and 'nominal' definitions, and the concept is intermittently discussed amid various philosophical inquiries, there is an absence of long-term analyses of 'definition' as a unified concept. The only book-length treatment of this topic that I am aware of is Richard Robinson's *Definition* (1954). The fact that there are few explicit theories of 'definition' is confirmed by several sources. In the December 1993 volume of *Philosophical Studies*, guest editor Marian David chose 'Definitions' as a topic for submitted articles because despite their important role in analytic philosophy "there is hardly any literature" about definition. In that same volume, Nuel Belnap (1993) is disappointed about not finding substantial modern theories of definition, especially in texts that are histories of logic.
(1) Reportive Definitions

The concept of a reportive definition is familiar. This kind needs little elaboration and only a few examples. The truth (or falsity) of a reportive definition depends upon whether the sense(s) attributed to the linguistic entity are in fact the senses attributed to the symbol by a community. The entries in any standard dictionary are examples of reportive definitions. Reportive definitions are intended to be 'true to' actual usage. For example, the dictionary definition that 'mountain' means 'a large mass of earth or rock rising to considerable height above the surrounding landscape' is a true report of how English-speaking people use the word. But dictionaries are not the only source of reportive definitions. When asked for the definition of a term, a person can report what is believed to be the ordinary meaning of the term.

(2) Theoretic Definitions

The second kind of definition is a 'theoretic definition.' A theoretic definition generally affirms the reported equivalence between a definiendum and a definiens, but further seeks to analyze the 'nature' or 'associated material conditions' with respect to a natural kind of entity. A natural kind entity is thought to have intrinsic properties and an independent nature. Aristotle, in *Metaphysics* VII and the *Posterior Analytics*, invokes a concept of definition with respect to the natural world. Aristotle was concerned with definitions about 'substances' that he conceived to be 'naturally unified' entities, which included animals and plants. 'Substances' have a self-unity or a self-contained form. At *Posterior Analytics* 93b29, he maintains that a definition is an account of 'what a thing is.' At *Metaphysics* 1031a12, he states that a definition is the formula of the essence, and the
essence must belong to substances. At *Topics* 101b38, he states that a definition is a phrase signifying a thing's essence (Ross, translator). Aristotle compares other objects that do not have an intrinsic self-unity (e.g. a pile of sand, a rock, a table, a bronze statue) and calls them 'deficient' or 'derivative' in 'being' compared to substances. Natural kind entities, but not derivative beings, can be said to be the object of a theoretical definition.

Hilary Kornblith provides a scientific characterization of a 'natural kind' as a product of 'homeostatic property clusters.' A 'homeostatic relationship' is where a relatively stable state of equilibrium between interrelated physiological factors maintains even in the face of changes in environment. The concepts of homeostatic causal relationships and property clusters are also developed by Richard N. Boyd (1988, 1991).

Below is text of Kornblith's (1993) account of physical natural kinds as endorsed here:

Natural kinds involve causally stable combinations of properties residing together in an intimate relationship (p. 7). It is nature which divides the world into kinds by creating stable clusters of natural properties residing in homeostatic relationships. Some properties are *essential* to natural kinds because they are part of this homeostatic cluster or an inevitable part of it; other properties of members of the kind are merely accidental (p. 56, italics added).

Examples of entities that purportedly possess essential properties and theoretic definitions are found in physics (electron, kinetic energy, heat, torque, and centripetal force), chemistry (acid, salt, and periodic chart elements), astronomy (black hole, planet), and psychology (intelligence, frustration). More controversially, biological terms are believed by some theorists to be natural kind concepts (gene, mice, marsupial mice, and octopus).
With natural kind concepts attention is paid to the (objective) nature of the phenomena involved. Philosophical concepts such as knowledge, truth, and definition can be conceived of as natural kinds.

**Paradigm Examples of Natural Kind Concepts (with Theoretic Definitions)**

1. *Electron*-- An electron is associated with quantum numbers, wave-particle duality, indeterminate position-momentum, among others. Buchwald and Warwick (2001) state that the electron's characteristics, charge and mass, have become better known since its discovery in the nineteenth century (pp. 16-17).

2. *Knowledge*-- Knowledge is often treated like a natural kind. Epistemic 'personal justification' is sometimes (errantly) treated as a natural kind.

3. *Truth*-- The 'correspondence theory' is popular: A proposition \( p \) is 'true' just in case it corresponds to facts or the world. A \( p \) (a belief, proposition, assertion) is true if it corresponds (or correctly describes) a state of affairs. Another definition not using 'correspondence' from A.N. Prior (1971, pp. 21-22): "To say that \( S \)'s belief that \( p \) is 'true' is to say that one believes that \( p \) and (it is the case that) \( p \).

**(3) Stipulative Definitions**

A 'stipulative definition' introduces a specialized definiens for a definiendum. There are three subcategories; a) initial naming definitions, b) linguistic abbreviations, and c) formalized definiens for pragmatic, technical, or personal reasons. *These examples of definitions should be read carefully.* I believe that many issues in all domains of contemporary analytic philosophy are undermined by a lack of understanding of the role of stipulative definitions found in both natural and artificial languages.
Paradigm Examples of Stipulative Definitions

(a) Initial Naming Definitions

Initial naming definitions, as a form of stipulative definition, have the function of introducing a new term to denote an entity.

(1) I shall at this moment name my new puppy 'Spot.' (Source: A dog owner declaring the name of her new puppy).

(2) This particular platinum-iridium bar (at a temperature of 0 degrees celsius) will now constitute the standard measure of a 'metre.' (Source: The French National Academy in the late 19th century).

(3) An 'electron' is the name designated for a negatively charged subatomic particle. (Source: Scientist, George Johnson Stoney, 1891).

(4) A 'rigid designator' is a linguistic entity that designates the same object in all possible worlds in which the object exists and never designates anything else. (Source: Philosopher, Saul Kripke, 1980).

(b) Abbreviatory Definitions

The function of a definitional abbreviation of the 3b variety is the substitution of a shorter term (the definiendum) for a longer expression (the definiens). A necessary condition of a successful abbreviatory definition is that it connects a mark or a sound (i.e. definiendum) to a meaningful definiens. For any definiendum-to-definiens relationship to have a cognitive intelligibility for persons involved, the definiens must have content that is (to some degree) understandable to the parties involved.
(6) In the remainder of this essay, I will abbreviate 'trigeminal neuralgia' as 'TN.' (Source: An article about nerve disorders. The author proposes a short symbol for a longer one to save space and for easier reading).

(7) In this contract, the name 'John Smith' designates the term 'lessee.' (Source: An apartment contract where for typographical convenience, and consistency, the predicate 'lessee' is substituted for a proper name).

(c) Precisely Formalized Definitions

Precise formalized definitions involve terms that have an established use (and typically a reportive definition) but where a definiens alteration is proposed for pragmatic, technical or personal reasons. The function of a formalization is to modify the definiens of the term (i.e. definiendum) being defined.

(1) Pragmatically formalized definitions

(5) A person is 'tall' if he or she is 6 feet in height or greater. (Source: A person evaluating how many tall people participate in a basketball league).

(6) 'Light' means 'One third fewer calories.' (Source: A definition proposed by the United States Food and Drug Administration with the intent of making the labeling of food more consistent in 1991).

(2) Technically formalized definitions

(7) An 'analytic sentence' is a sentence that is true solely in virtue of the meaning (or the definitions) of its terms. (Source: A definition originating with Kant)

(8) 'Truth' is a property of sentences (in a given formal model) and sentences are truth bearers. (Source: Logician, Alfred Tarski, 1944).
(3) Personal formalized definitions

(9) 'Happiness' is good health and bad memory. (Source: Actor, Ingrid Bergman)

(10) 'Leadership' is a person's being able to guide or inspire others, to enlist support in the accomplishment of a common task. (Source: Motivational speaker, Mark Shead, 2018).

Summary of the Tripartite Theory of Definition

In summary, a disjunctive definition of 'definition' is hypothesized: x is a 'definition' in a definiendum-to-definiens relationship if and only if it is (1) reportive, or (2) theoretic, or (3a) an initial naming assertion, or (3b) an abbreviation, or (3c) is a precise formalization for pragmatic, technical, or personal reasons. This definition of 'definition' presupposes an intentionality of sentence use and that this intentionality is a property of (human) mental systems. This tripartite definition is either true or false as a description of the nature of ‘definition.’ The definition is a theoretic definition. The challenge to any skeptic of this definition is to provide a single counter example.

On the Importance of a Theory of Definition

A theory of definition is of great importance in understanding the discipline of mathematics. As stated, as a mathematical anti-realist, I contend that formal systems are wholly composed of stipulative definitions and implicit definitions (i.e. axioms). Stipulations are neither true nor false; but can only be agreed-to. In formal deductive systems we typically find (1) the stipulated introduction of a vocabulary of symbols and definitions about what counts as an individual constant, individual variable, predicate, proper name, sentential connective, punctuation, and quantifier, (2) the stipulated
introduction of syntactical formation rules (or grammar) that defines how 'well-formed formulas' are to be constructed out of symbols (i.e. a procedure that determines whether a sentence, as a finite strings of words or symbols, is 'meaningful' or not), (3) a set of stipulated truth-preserving inference rules, and (4) a semantics (e.g. truth-table definitions of connectives, or interpretations using symbolization keys and extensions). I contend that formal systems stipulate rules (in the form of stipulative definitions) in the construction of any formal measurement system. This perspective is in opposition to mathematical realism which contends that: (1) there exist mathematical objects, (2) mathematical objects are abstract, and (3) mathematical objects are independent of persons, including their thought, language, and practices. Obviously, a complete anti-realist theory of metamathematics cannot be presented here, but a theory (or hypothesis) about 'stipulative definition' is a good starting point.

Part II: How is the Tripartite Theory of Definition Verified? (Optional)

The tripartite theory is a social scientific hypothesis about the actual modes of how persons can intelligibly specify their use of a linguistic symbol in a definiendum-to-definiens relationship. The theory maintains that all definiendum-to-definiens relationships can be objectively quantified as falling under these three kinds as based upon a speaker’s intent and the context of the assertion. All other kinds of definitions are identical to, fall under, be explainable, or refutable under these three primary types. How can this hypothesis be verified?

In order to verify the truth of the tripartite theory we will investigate language use in various situations. If one were to find definitions that weren't charitably classifiable in
one of these five categories, then the theory would be disconfirmed (with an appropriate argument). Let us survey, and paraphrase, nine kinds of definitions under the entry of ‘definition’ contributed by Takashi Yagisawa in *The Cambridge Dictionary of Philosophy* edited by Robert Audi (1999) and start an investigation with short responses.

**Real Definition**

A ‘real definition’ is the “specification of the metaphysically necessary and sufficient condition for being the kind of thing (usually a common noun) designates; e.g. ‘element with atomic number 79’ for ‘gold.’ Locke spoke of real essence and contrasted it with nominal essence.” **Response:** A ‘real definition’ is best interpreted as a theoretic definition where an assumed natural kind entity is presumed to have some objective condition(s) that are necessary (essential) and/or sufficient for its instantiation.

**Nominal Definition**

A ‘nominal definition’ is “the definition of a noun (usually a common noun), giving its linguistic meaning. Typically, it is in terms of macro-sensible characteristics: e.g. ‘yellow malleable metal’ for ‘gold.’ Locke spoke of nominal essence and contrasted it with real essence.”

**Response:** The distinction between ‘nominal’ definiens i.e. *about words* (e.g. yellow malleable metal), compared to ‘real’ definiens that are *about things* is an ancient distinction that equates ‘nominal definitions’ as ‘3b stipulative abbreviations.’ This is illustrated when Cohen & Nagel (1934) state that "a nominal definition is an agreement or resolution concerning the use of verbal symbols. A new symbol called the *definiendum* is to be used for an already known group of words or symbols (the *definiens*). The
definiendum is thus to have no meaning other than the definiens. A nominal definition is a resolution and not anything true or false while nominal definitions do not extend our real knowledge, they aid in scientific inquiry… we economize space, time, and attention or mental energy if we use a new and simple symbol for a group of old familiar ones” (p. 228). More importantly, the nominal-real distinction mistakenly suggests that in a definiendum-to-definiens relationship, that the definiens is the primary subject (i.e. about words or things) of a definition. In contrast, as conceived here, a ‘definition’ is a sentence that connects a mark or sound (i.e. a definiendum) to a meaningful definiens. In the tripartite theory, the definiendum is always the subject of a definition. ‘Nominal definitions’ are best understood in context as stipulative or reportive.

**Recursive Definition**

A ‘recursive definition’ (also called inductive definition and definition by recursion) is a “definition in three clauses where (1) the expression defined is applied to certain items (the base clause); (2) a rule is given for reaching further items to which the expression applies (the recursive, or inductive clause); and (3) it is stated that the expression applies to nothing else (the closure clause). E.g. ‘John’s parents are John’s ancestors; any parent of John’s ancestor is John’s ancestor; nothing else is John’s ancestor.’ By the base clause, John’s mother and father are John’s ancestors. Then by the recursive clause, John’s mother’s parents and John’s father’s parents are John’s ancestors; so are their parents, and so on. Finally, by the last (closure) clause, these people exhaust John’s ancestors.” *Response:* The tripartite theory maintains that all three clauses of a recursive definition are examples of stipulative definition.
Explicit Definition

An ‘explicit definition’ is a “definition that makes it clear that it is a definition and identifies the expression as being defined as such: e.g. ‘Father’ means ‘male parent’; For any x, x is father by definition if and only if x is a male parent.” Response: With a tripartite theory of definition, we analyzed just definitions of this explicit definiendum-to-definiens form. Reportive, theoretic, and stipulative definitions are (all) about linguistic expressions that are potential subjects of an explicit definition.

Implicit Definition

An ‘implicit definition’ is “a definition that is not an explicit definition.” Response: A better explanation is that implicit definitions are those e.g. that are found in axiomatic statements. For example: ‘A straight line segment can be drawn joining any two points.’ In an axiomatic system, the undefined term (i.e. ‘straight’) in an axiom does not have any definite meaning (other than occurrence in an axiom) and may be interpreted in any way that is consistent with a given set of axioms. Implicit definitions (i.e. not formed in an explicit definiendum-to-definiens relationship) are best interpreted as being stipulative, where a consistency of related concepts is sought.

Synonymous Definition

A ‘synonymous definition’ is the “definition of a word (or other linguistic expression) by another word synonymous with it: e.g. ‘buy’ for ‘purchase’; ‘madness’ for ‘insanity.’” Response: Synonymous definitions can be either (1) reportive definitions for describing an existing community notational abbreviation (or synonymous substitution) of one linguistic expression for another meaningful linguistic expression, e.g. 'buy' for
'purchase,' or (2) in other contexts; as prescribing a new (sometimes localized) fixed definiens concept (or synonymy), e.g. the 'lessee' is 'John Brown,' or e.g. 'CFF’ stands for 'one hundred cubic feet.' In mathematics, this latter kind of abbreviation is typical.

**Precising Definition**

A ‘precising definition’ is “intended to eliminate ambiguity or vagueness. Two examples: (a) ‘snake of average length’ is precisely defined as a ‘snake longer than half a meter and shorter than two meters,’ and (b) ‘wealthy’ is defined as ‘having assets ten thousand times the median figure.’” *Response:* Precising definitions are stipulated definitions of the 3c mode. A precising definition extends the use of a reportive definition by including additional criteria to narrow down the set of things meeting the definition. I suggest that ‘legal definitions’ are also good examples: In Illinois (USA), for public university in-state tuition purposes, a person is considered a 'resident' if for at least six months prior to enrollment the person is employed full-time by an Illinois employer. In Wisconsin, a person is a 'resident' if for at least twelve months prior to enrollment the person is employed full-time by a Wisconsin employer. These legal definitions stipulate what a 'resident' is for pragmatic financial reasons, without affecting the reportive definition of ‘resident.’ Other examples: (d) The ordinary language conceptual analysis of ‘game,’ ‘aesthetic experience,’ and ‘art’ are precising.

**Ostensive Definition**

An ‘ostensive definition’ is a “definition by an example in which the referent is specified by pointing (or showing) in some way. For examples, ‘kangaroo’ applies to all and only animals like *that*, where *that* is accompanied by pointing to a particular
kangaroo. ‘Red’ is that color, where the word ‘that’ is accompanied with a gesture pointing to a patch of colored cloth.” Response: Ostensive definitions are best interpreted as ‘reportive’ in most instances but might be ‘stipulative’ in others (e.g. where a non-standard definiendum is used when pointing to an object for some special purpose).

**Persuasive Definition**

A ‘persuasive definition’ is “designed to affect or appeal to the psychological states of the persons to whom the definition is given. For example, a ‘politician’ can be defined as a ‘self-serving manipulator.’” Response: Another example; ‘abortion’ is ‘the ruthless murdering of innocent human beings’ as opposed to ‘a safe and established procedure whereby a woman is relieved of an unwanted fetus.’ Hurley (2009) says that "the purpose of a persuasive definition is to engender a favorable or unfavorable attitude toward what is denoted by the definiendum” (pp. 88-89). The term ‘persuasive definition’ was introduced by Charles Stevenson (1944) as part of his emotive theory of meaning. A persuasive definition is an example of stipulative definition (3c).

**Conclusion**

With a tripartite theory of ‘definition’ we have recognized three kinds of definition. I respectfully ask for potential counterexamples. If there are no counterexamples, then the tripartite theory is a true account of how persons (in context) may specify their intended use of a linguistic entity in a definiendum-to-definiens relationship. In other essays, I elaborate in detail upon how this theory is important to a philosophy of mathematics, and to issues in analytic philosophy in general.
References


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