

4 Guidelines for concept analysis

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A good part of the work called “theorizing” is taken up with the clarification of concepts – and rightly so. It is in this matter of clearly defined concepts that social science research is not infrequently defective.

(Merton 1958: 114)

The semantic import

Whatever we know is mediated by a language, if not by the language in which we know it. And if language is the *sine qua non* instrument of knowing, the knowledge-seeker had better be in control of the instrument. Bad language generates bad thinking; and bad thinking is bad for whatever the knowledge-seeker does next. Despite the much proclaimed quantitative turn of the social science endeavor, the fact remains that the bulk of our knowledge of ourselves is expressed in a natural language – not in a formal, formalized, or uninterpreted language. Whatever we measure refers to “named” variables; and formalization (i.e., the construction or application of uninterpreted systems of signs) plays a collateral and instrumental role in the social science enterprise. So the basic fact is and remains that we stand on, and walk with, a natural, interpreted language. And the central trait of a natural language consists of its semantic properties. First of all, then, we are peremptorily required to master the *meaning function* of words – that is, semantics.

Semantics is a sort of crossroad discipline and thus has, understandably, many facets. It can refer to the development and change of meaning (historical semantics), to the interlocking of meaning and logic (truth-conditional semantics), to how language relates to “culture” (as in the Sapir-Whorf hypothesis), and so forth. In the systematization proposed by Morris (1946), semiotics (the general theory of signs) is subdivided into (1) syntactics, the relation of signs to signs regardless of their meaning function; (2) pragmatics, the relation of signs to behavior; and (3) semantics. The distinction between semantics and syntactics is the important one. What has followed from this distinction is, in the summation of Hilary Putnam (1975, vol. 2: 139), an “enormous progress . . . in the *syntactic theory* of natural languages,” but hardly a “comparable progress . . . in the *semantic theory* of natural languages.” There are many reasons for the lag of the latter. One of them has to do with the distinction between semantics and pragmatics. The distinction is, in itself,

valuable and acceptable; but it has been drawn in ways that impoverish semantics and overextend pragmatics. On the one hand, logicians tend to attribute to the realm of pragmatics whatever cannot be handled in terms of truth-value, thus restricting the ambit of semantics to true-false "propositions." On the other hand, linguists tend to reduce semantics to what they would do anyhow as linguists. On account of the resulting amputations (which result, in turn, from the way in which disciplinary fiefs happen to be drawn), much of the present-day treatment of semantics misses, I submit, what matters most.

For want of an established label let me propose as the nucleus to which I give prominence the notions of *projective semantics* and, derivatively, of *semantic projection*. Moreover, since the expression "semantic meaning" has been utterly trivialized, I shall say, more pointedly, *semantic import*. In a nutshell, the semantic import of words entails that (1) what is *not named* largely remains *unnoticed* or, in any event, impervious to cognitive development; and that, (2) the *naming choice* (selecting a given word within a given semantic field) involves a far-reaching *interpretive projection*. All told, then, projective semantics brings to the fore both the *constraints* and the *pathways* that any given natural language imposes upon and affords to our perceiving, thinking, and knowing. But let us proceed orderly.

My premise is that in the beginning is the word, that is, *naming*. We express what we mean (what we have in mind) by picking from within the ambit of our natural language the "right words." Conversely, we are unable to express exactly what we mean unless we find words for it. By affirming that in the beginning is the word, I am simply asserting that we cannot form a sentence unless we already know the meanings of the words it contains.¹ It is not that words *acquire* their meaning via the sentences in which they are placed. It is the case, rather, that the meaning of a word is *specified* by the sentence in which it is placed. If "context" is applied to "sentence," then words out of context (as itemized, e.g., in dictionaries) have signification just as much as words in context. The difference is that words out of context are (in a natural language) polysemes, whereas words in context are less multi-meaning for the context (sentence) suggests which meanings are not intended and, conversely, intended.²

Even though it goes without saying, it is safe to say it: Not all words have semantic meaning. For one, personal names (of persons and also of places) do not enter the purview of semantics. Also, connectives (conjunctions, sentence-forming operators, etc.) have only a syntactic meaning. So, semantic considerations apply to words that can be used – in sentences – as subjects or predicates (and, derivatively, to the verbal forms which have a corresponding noun form). Furthermore, it should be well understood that in this writing we are not interested in any and all words but specifically in those "important words" that are carriers of concepts, that can be said to constitute, in some meaningful sense, *units of thinking*.³

Bearing the foregoing qualifications in mind, I take the central tenet of semantics to be that "language is constitutive of the reality, is essential to its being the kind of reality it is" (Taylor 1971: 24). The author that makes the point as forcefully as it can possibly be made is Whorf, who writes: "We dissect nature along lines laid down by our native languages . . . we cut nature up, organize it into concepts, and

ascribe significances as we do, largely because we are parties to . . . our speech community." Thus, "facts are unlike to speakers whose language background provides for unlike formulation of them." Still more comprehensively, thinking "is in a language – in English, in Sanskrit, in Chinese. And every language is a vast pattern-system . . . by which the personality not only communicates, but also analyzes nature, notices or neglects types of relationship and phenomena, channels his reasoning" (1956: 213, 235, 252).

Whorfianism (or the Whorf-Sapir hypothesis) is often criticized quite unfairly.⁴ It does upset the view that thinking is the master and language its infinitely versatile slave; it does not uphold, however, a linguistic "determinism." Whorf's linguistic and/or cultural relativism may well be excessive; it does not endorse, however, "untranslatability" in principle (nor can the problem be disposed of by noting that translations and cross-cultural communications do in fact occur). This having been said in fairness to Whorf, my own view (Sartori 1979: 23–28) is that it is our thinking that monitors our language, even though thinking, language, and culture largely interpenetrate each other and evolve in feedback fashion. Be that as it may, ultimately the fact remains that as each individual thinks about something at each point in time, he or she does relate to a particular linguistic system as a "given." Hence, at that moment his natural language is his *thought-molding instrument*. It is thought-molding in the sense that he is thinking via a vocabulary that embodies an overall way of *perceiving* and *conceiving* reality.

In order to establish the point, let me single out two aspects of the semantic import of words (the ones amenable to semantic consideration): (1) a *slicing aspect*, and (2) the *interpretative aspect*. All words provide some kind of cutting up or slicing of the real world. In addition some words (especially the ones amenable to conceptual rank) also shape the perception and/or the interpretation of whatever we take cognizance of. The notion of semantic projection may be said to apply with full force, or more specifically, to the perceptive-interpretative "track" that words (some words) provide. Does the distinction between slicing and interpreting correspond to the one between object-words and concepts? Roughly, yes. However, it is worthy to note that even words of natural objects may have a semantic projection. In the classical example of Wilhelm von Humboldt, the word for moon in primitive ancient Greek was *mene* (from a root that meant "to measure"), whereas in Latin it was *luna* (from *lucere*, "to illuminate"). This entails that the primitive Greeks interpreted the moon as an instrument of measuring time, as a substitute for a calendar, whereas the Romans perceived it as a surrogate of light, as performing an illuminating function (at night). Note that *mene* and *luna* have exactly the same denotation (i.e., point exactly to the same object). They differ, however, in their connotation. The example shows that words "interpret" things precisely because their denotation is filtered by their connotation.

However, most words for natural kinds or physical objects do not embody an interpretative projection; their semantic import generally resides in how broad or how thin their cutting up of phenomena is. The easiest illustration of "slicing difference" is provided by colors. While no language appears to have more than twelve color categories (English has eleven), some languages have only

two: “black” and “white.” Does this entail – it has been asked – that a two-name vocabulary renders its user color-blind to other colors? Almost certainly not. It does imply, however, that the colors that are named acquire perceptive prominence and, secondly, that the fewer the categories, the greater the range and diffuseness of the colors that are being singled out. Other examples of slicing differences relate to the presence or absence of abstract, general terms. For instance, the Eskimos do not have the general word “snow,” but a variety of specific words for specific states of snow. Contrariwise, the Aztecs (who did not have to worry about arctic weather) had just one and the same root word for ice (the noun), cold (rendered by icy, the adjectival form), and snow (rendered as ice mist). Likewise, Bedouins do not have the general term “camel,” but a very extensive and minute terminology for specific features and varieties of camels. Finally, and more strikingly, counting systems may not have the numerals “one,” “two,” “three,” and so on. There is a Brazilian language in which the counting field is divided into: none, one or two, three or four, and many. Here – one may suspect – “individualism” (the conception) is not likely to fare well.⁵

It will be noted that none of the foregoing examples – the ones that are generally found in the semantics literature – refer to the important words that acquire conceptual rank. Yet it is at this level that words condition and channel our reasoning and, therefore, that their semantic projection comes to the fore. Since my agenda in this essay is a crowded one, I can afford two examples only – the simplest ones I can find.

Consider the words state and government. For quite a long time English has preferred “government” to “state,” and has indeed translated the French *état* and the German *Staat* into “government.” Much of the continental European literature has taken the opposite course, thus considering “government” one of the partitions of the state (the general term). As one changes language one obtains, then, the configurations that are contrasted in Figure 4.1.

In the first part of the figure “government” covers the whole (i.e., is the general term); it is also a subclass of itself (when government is restricted to mean “the executive”); and may be (especially in translations) a synonym of “state.” On the right the configuration is, instead, a straightforward one: “State” is the general and abstract term, while government is one of its component elements and unequivocally indicates the executive branch (of the state). What are we to make of this contrast?

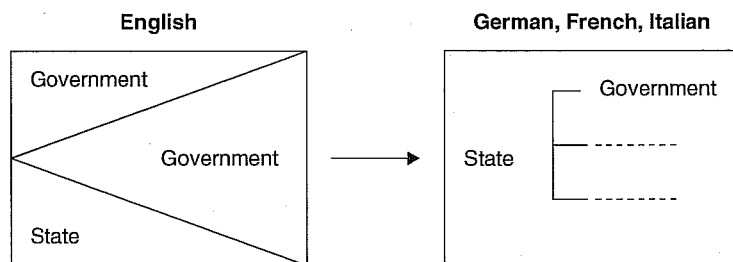


Figure 4.1 Differences in semantic configurations.

Compounding a somewhat subtler argument, that whoever addresses the topic in English is handicapped in two respects: he or she is more exposed to ambiguities and, second, covers less ground in that much of what has been elaborated in the other languages in terms of an abstract, juridical and also philosophical theory of the state will be missed. Conversely, Continental Europeans will miss much of the concreteness (real governments, real people) that characterizes the Anglo-American literature. To be sure, one may always contend that these differences reflect cultural traits. If so, we are simply pushing the argument back to a highly elusive prime mover (the culture), and the additional assumption is entered that it is the culture that generates the language. At the end of this detour the point remains as it is: whatever the ultimate and distant causal factor, the proximate one is that the linguistic eyeglasses of an English author prompt him to approach the topic in a way that radically differs from the track suggested by German, Italian, or French. In short, in English I do not “see” the state; an Italian that only knows Italian does (or so believes).

My second example will be handled even more simply. “People” is in English a plural, whereas *Volk*, *peuple*, and *popolo* are, grammatically, singular. So what? Well, English authors have difficulty in understanding and seldom accept “people” conceived as an oversoul, or as an organic indivisible entity – a notion that has been largely entertained by the German, French, and Italian speech community. A sheer coincidence? Or is it not the case that when we say “people are” we are semantically prompted to perceive and conceive a multiplicity, a sum total of “each body,” while those who say “people is” are predisposed and encouraged to conceive an “allbody,” a whole that subsumes its parts?

Another angle from which to grasp the semantic import of words is, of course, to look into the words that give trouble to the translator. Take the German *Aufhebung*, which is the key term of Hegelian and idealistic dialectics. We have settled for translating it, in English, with “superseding” – hardly a term that conveys the Hegelian concept. Indeed, Hegel translated into English is ludicrous. We have never been able to convey what the Ancient Greeks meant by *polis* and derivatives (another key word). Conversely, ancient Greek has no word for “intelligent” (the closest term would be *sophos*). The English “spirit” (at times weirdly rendered as “ghost”) is only an empty calque of the French *esprit* or the Italian *spirito* which are (like the German *Geist*) terms of highly significant conceptual richness.

However, let us not overshoot the mark. That speakers in different languages cannot form (conceive) the same concepts is certainly not true for all concepts, and very much depends on which are the languages in question. English, incidentally, is a good receiver for its vocabulary draws extensively from Saxon, Latin, Greek, and French. A number of European languages have also interpenetrated one another for centuries, if not for millennia. I, for one, do manage to rethink myself across SAE (standard average European). However, when I read how English has to be rendered in Chinese, Japanese, Hopi, Navaho, and other non-SAE languages – and conversely how these languages are rendered in English – I feel pretty sure that I miss a great deal precisely because thinking is language-wrapped.⁶

To sum up, our knowing is, intrinsically and inextricably, *onomatology* – logos about (mediated by) names. This is what my notions of semantic projection and semantic import bring into prominence. In order to make my case as simply as it can possibly be made, my unit of analysis has been the word. But, as will be apparent in the subsequent proceedings, the full case extends to, and actually stems from, a linguistic system in its entirety. Actually, my crucial concept will be the one of *semantic field*, conceived as a manageable breakdown and the most meaningful subunit of a whole linguistic *system*. For the time being let me simply stress that when semantics is taken seriously, then we are fully entitled to assert, “this is the wrong word,” for the assertion renders the constraints of language (as a system) with respect to the semantic projection of words.

The basic scheme

Clear thinking requires clear language. In turn, a clear language requires that its terms be explicitly defined. In order to avoid cumbersome, and also on grounds of expediency, the terminology (and metaterminology) of our enquiry is brought together and defined in the glossary. It should be well understood, then, that the aforesaid glossary is an integral and indeed constitutive part of this writing: whatever is in need of being defined is defined there.

On this proviso, let us immediately come to the strategy of conceptual analysis that I shall employ. The most useful scheme of “concept unraveling” from which to start is, I submit, the one outlined by Ogden and Richards and known, therefore, as the Ogden and Richards “triangle” (1946: 11). Following their lead (although not their terminology), the frame of the argument is that the knowing and the known can be broken down into three basic component elements: (1) *words*, (2) *meanings*, (3) *referents*. In turn, words, meanings, and referents are best distinguished by addressing the following two fundamental questions:

How do meanings relate to words? How do meanings relate to referents?

With respect to the first question, the relation between meanings and words can either be *equivocal* or univocal, either *ambiguous* or clear. With respect to the second question, the relation between meanings and referents can either be *vague* or not,⁷ either *undenotative* or adequate.⁸

Generally, “word” is used interchangeably with *term* (with the implicit understanding that “word” is broader and all-encompassing because also connectives or conjunctions are words); “meaning” is often called *connotation*; and “referent” is frequently rendered as *object*. We also speak of the connotation of a concept as its *intension*. When we say “connotation,” its complement is *denotation*; and when we say “intension,” the complement is *extension* (in a technical meaning of the term). Our basic metaterminology can now be organized as in Ogden and Richards (except that their triangle is now an angle) and represented as in Figures 4.2–4.5.

Figure 4.2 is my redrawing – with amendments – of the Ogden–Richards triangle. It indicates, in particular, that “term” is preferred to “word” (since we shall

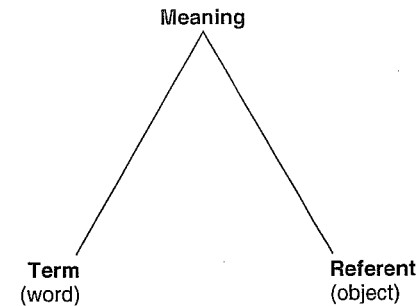


Figure 4.2 The basic scheme.

stipulate that “term” is a word allocated to a concept), and that “referent” is preferred to “object” (let alone “reference”). But what does the word referent mean? I shall define it: whatever is *out there* before or beyond mental and linguistic apprehension. So to speak, referents are the real-world counterparts (if existent) of the world in our head.

Figure 4.3 addresses the important and yet troubling notions of intension-extension and/or connotation-denotation.⁹ As the figure indicates, in this analysis intension is (means) the same as connotation, and extension is the same as denotation. There is no problem with defining *intension* or connotation: it consists of the ensemble of characteristics and/or properties associated with, or included in, a given word, term, or concept. Within this generally agreed upon signification let my own definition be the following: the intension (or connotation) of a term consists of all the characteristics or properties of that term, that is, assignable to a term under the constraints of a given linguistic-semantic system.¹⁰

So far, however, we have not added much to the plainer notion of meaning, for also the “meaning of meaning” could be defined as we have just defined the intension. What is it, then, that we gain by saying intension or connotation? The gain comes from the pairing, that is, from the fact that “intension” goes with “extension” (just as connotation goes with denotation), that these notions are complementary and crucially interrelated. The important question thus becomes: what is the *extension*, or the denotation? A perusal of the literature detects two very different replies. Hospers, for instance, asserts, “The entire denotation of a word is the complete list

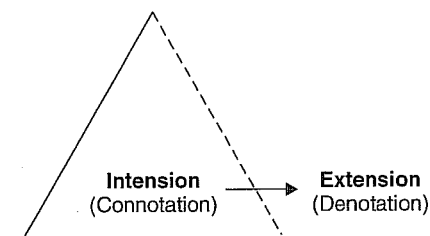


Figure 4.3 Intension and extension.

of all the things to which the word applies,” and emphatically denies that words denote classes of things: “The denotation of a word is always an individual thing” (1967: 40, 42). Now, if “denotation” is extralinguistic, Hospers’s point is correct.¹¹ But Salmon (1964: 90) and others define the extension as follows: “The extension of a word consists of the class of all objects to which that word correctly applies.”¹² And when “things” is replaced by “class of things,” the implication is that the ambit of the extension is just as linguistic (and mental) as the ambit of the intension.

Clearly, the relation between the intension and the extension addresses the gnoseological problem. How do we reach out? How do we pass from what is “in our mind” to what is “out there”? (Or, conversely, how does the outer world enter into our mind?) The solution suggested in Figure 4.3 shuns the epistemological controversy. What the figure conveys is that the complementarity of intension and extension (or of connotation and denotation) purports to cross the border between the mental and the extramental, between what is already apprehended linguistically and what is extralinguistic (a pure and simple “referent”). Hence, the right side of the angle is segmented and allows for a breach. To be sure, if we were to confront the gnoseological issue we would need a second arrow that goes back from the outer world into the mental one. However, it is not for us to decide if and how our knowing “seizes the object” out there. The point that bears on our concerns simply is that “the denotation of a term clearly depends upon its connotation” (Cohen and Nagel 1936: 32). A conclusion that also applies, I submit, to object terms.¹³

Once the relationship between intension and extension has been appraised, the next step is to ask ourselves whether the ensemble of characteristics of a term (i.e., its intension or connotation) is amenable to some kind of organization. In this connection it should be borne in mind that some concepts (or terms) may display a dazzling number of characteristics. How are we then to handle the wealth of connotations that enter, or may enter, the concepts that we are addressing? Figure 4.4 suggests that the overall pool of characteristics, properties, or attributes of a concept may be conveniently disaggregated into two clusters. A first cluster (on the left side) brings together the *non-observable* or *least-observable characteristics*, while the second cluster (on the right side) brings together the properties that

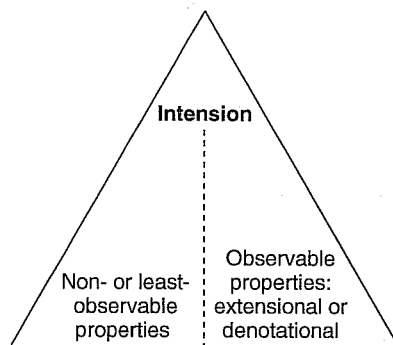


Figure 4.4 Observable versus non-observable properties of intension.

are amenable to observation. In accord with our previous discussion and as a follow-up of Figure 4.3, in Figure 4.4 the latter cluster, or subset, is labeled *extensional* or *denotational properties*. These are the properties that appear to be suited, or relatively more suited, for “seizing the object.”

The implication of Figure 4.4 is that whoever addresses empirical and research problems is well advised to extract from the overall heap of the intension the subset of properties that I have called “extensional” and/or “denotative”; whereas the more theoretically oriented scholar will be largely dealing with the subset of characteristics that our representation places in the proximity of “term” rather than in the proximity of “referent.”

Let us turn to Figure 4.5, which deals with what goes wrong (the defects) and is largely self-explanatory. The argument visually represented in the figure is, in brief, the following. The meaning-to-word relation is defective when it is ambiguous and/or equivocal. To be sure, in a natural language almost no word is univocal (i.e., endowed with only one meaning): all words are polysemic, or polysemes. Therefore the defect is not in the multiplicity of the meanings of each word per se (out of context) but resides in their entanglement, in the fact that it is unclear (in context) which meaning is intended. In short, the problem is *confusion of meanings*.¹⁴ The activity that we have come to call disambiguation does not purport, then, to attain univocity – a one-to-one correspondence between meaning and word – but clarity (of meaning). Thus, univocal meanings are, eventually, an ideal objective. The concrete problem that we confront is reducing ambiguity and dispelling equivocation.

On the right side of Figure 4.5 the argument is that the meaning-to-referent relation is defective in that it is vague. As I have said, the problem here is to seize the object. Thus a concept that lacks “denotative adequacy” is a concept that obtains unbounded or fuzzy referents. If so, the remedy consists of increasing its denotative and/or discriminating power.

The last suggestion is to superimpose, mentally, Figure 4.4 upon Figure 4.5. Figure 4.4 may now be said to convey that the left side of our angle centrally addresses the *terminological problem* (the problem of “termining the concept”), whereas its right side centrally addresses the *denotational problem*. This entails –

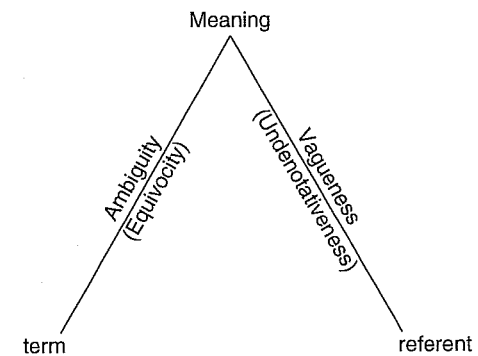


Figure 4.5 Defects: ambiguity and vagueness.

in relation to Figure 4.5 – that we now have a compass for deciding which properties are to be extracted from the overall pool of all the characteristics (that can be predicated of a concept) for which purpose: either the primary intent of disambiguating the concept, or the intent of increasing its denotative power. In short, we now have a compass for making sure that we are not extracting (from the inner area of our angle) the wrong characteristics for the wrong purpose.

It may strike the reader that our figures do not mention “concept.” Now, one may certainly say that a concept has meaning, needs a term, and, if empirical, points to referents.¹⁵ The implication is that whatever is predicated of one of the three component elements of the scheme can also be more broadly predicated of “concept.” I take it, though, that the crucial point is how “concept” relates to “sentence.” In this purview, concept is defined: the basic unit of thinking. This is, admittedly, a loose definition. It does bring out, however, that it is the concept that *circumscribes* whatever we apprehend into meaning-centered units. To be sure, concepts are defined, shaped, and explicated via sentences. Yet, it is the concept that structures the sentences it governs – not the other way around.

Our overall scheme of analysis assumes, then, that the defectiveness of a concept is best seen as, and actually results from, its ambiguity and/or its vagueness. The basic layout of my guidelines can thus be summarized and expressed in a “practice-oriented” rule form, as follows:

Rule 1: Of any empirical concept always, and separately, check (1) whether it is ambiguous, that is, how the meaning relates to the term; and (2) whether it is vague, that is, how the meaning relates to the referent.

The first part of Rule 1 addresses the question: what is *the meaning* of a concept? This question confronts the problem of confused and many-to-one relations among meanings and words. Its purpose is to achieve *clarity*, to identify ambiguities and correct errors of equivocation. The second part of Rule 1 addresses the question: what is *the referent* of a concept? This question confronts the problem of inadequate linkages among meaning and referent. Its purpose is to achieve *denotational adequacy* or denotativeness. Rule 1 specifies “empirical concept” in order to underline that it does not address concepts that lack extension. A concept is empirical if, and only if, it can be rendered in *testable propositions* that confirm it (in some respect or extent); and a concept cannot be so confirmed or falsified – with respect to the propositions it generates – unless we identify its extension.

In the following sections we shall look in some detail into the following: the causes and remedies of ambiguity (“Defining”); the organization of the intension (“Ambiguity, homonyms, and synonyms”); and the causes and remedies of vagueness (“Organizing the intention”). But before exploring these three problem areas one by one, let us complete our scheme of analysis.

Defining

Having identified two kinds of conceptual faults, the question is how do we cure these defects? The first reply is this: one way of curing concepts lies in *defining*.

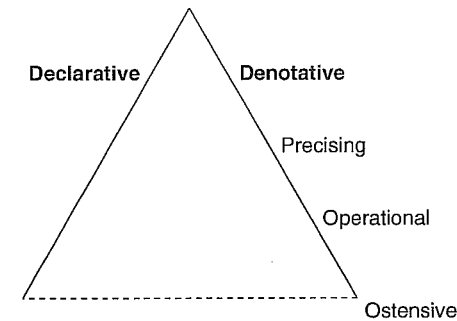


Figure 4.6 Definitions: declarative versus denotative, and types of denotative.

Granted, this reply is not very helpful unless we know (1) how to define, and (2) for what purpose. That is to say that we need not only a typology, but also a map of where various kinds of definitions are located. For this latter purpose our initial scheme of analysis (Figures 4.2–4.4) can be converted into Figure 4.6.

The simplest definition of definition is a declaration of meaning – hence, *declarative definition*.¹⁶ The objection might be that a simple declaration of meaning is less than a definition (in the proper or more technical meaning of the term). However, this objection applies even more to ostensive definitions, that are nonetheless called definitions.¹⁷ Moreover, if we consider that declarative, or declaratory, definitions cover the entire left side of our scheme, it is clear that there are many ways of handling the meaning-to-word relationship, many of which do consist of definitions in a more strict or proper sense.

Let us exemplify with reference to the concept of man. A declaration of meaning might be “by ‘man’ I intend males but not females.” We might say that this is a stipulation, hardly a definition; yet it already serves the purpose of declaring a meaning. In any event, most declarative definitions pick up a lexical definition (that cannot be challenged as not being definitions). Example: by man I intend a rational animal. The common element of all declarative definitions resides in “disambiguation,” in the fact that they reduce or eliminate equivocation.

Turning to the meaning-to-referent relationship, along this side Figure 4.6 locates four kinds of definitions: denotative, precising, operational, and ostensive. The general class (the symmetric vis-à-vis of the declarative definition) is here *denotative definition*, which I define as follows: all the definitions intended to seize the object (by increasing the denotativeness).¹⁸ However (as we shall see in detail in “Undenotativeness (vagueness)”), denotative definitions confront different problems – namely (1) establishing the boundaries; (2) sorting out the membership of any given denotatum; and (3) deciding the cut-off point vis-à-vis marginal entities.

Since the requisite of any extensional definition is to include-exclude, it can be assumed that a denotative definition is such (i.e., adequate) when it sets the boundaries. This is the same as saying that a denotative definition serves the general requirement of whatever defining occurs along the meaning-to-referent side of the angle. Yet, boundary setting is not all. In the first place, within our borders we may

obtain a fuzzy membership and/or weird bedfellows. For instance, “mammal” has, in zoology, well-demarcated boundaries; but we must be able to discriminate, for most purposes, between whales and human beings. For this specific and quite distinct purpose I propose the label *precising definition*.¹⁹ It may be argued that precising definitions are a trivial subclass of denotative definitions in the sense that the latter are obtained via the same procedure as the former, which is in essence to augment the number of the defining characteristics. Yes and no, however. If “table” is defined as a flat surface sustained by four legs, then six-legged or three-legged or even one-legged tables are not tables. We may wish to solve the problem by defining table as characterized by having between one and eight legs. It seems neater, however, to define table as a surface sustained by legs (denotational definition), and to enter a specification of the number of legs (precising definition) when a problem of fuzzy membership arises.

The insertion along the meaning–referent relation of precising definitions helps, in turn, to give a more accurate destination to *operational definitions*. In the mapping of Figure 4.6, operational definitions are located in the lower right end of the scheme. This does not imply that they are subordinated to precising definitions. What the mapping is meant to convey is that operational definitions are *another* subclass of denotative definitions located at a different point (in greater proximity of the referent) than precising definitions. In any event, and regardless of whether one accepts the proposed insertion of precising definitions, the indication conveyed by the overall mapping is that far too much is omitted when we leap, as it were, from declarative definitions to operational definitions. The operationalization of a concept often entails a drastic and eventually distorting curtailment of its connotation. For instance, “rational man” may be defined operationally as the capability of responding to, and of being scaled by, an IQ test. This is fine, but is also an enormous impoverishment of a wealth of connotations. The point is, then, that the alternative is not either operationalize or perish. We may not be able to operationalize a concept, and yet we can satisfactorily proceed toward seizing the object on the basis of denotative definitions supplemented by precising definitions.²⁰

Let us continue with our example. A denotative definition of “man” could be the following: man is a two-legged animal (*animal erectus*), without feathers, that symbolizes (Cassirer’s [1944] *animal symbolicum*). This is an adequate denotative definition for it suffices to exclude all the living beings that are not human beings. Had I only said, instead, “man is a two-legged animal without feathers,” the object would not have been adequately seized, for this definition would have excluded birds but would still have included apes. The question that might arise in connection with the example at hand is, why is it that “man as a rational animal” is considered a declaratory and not a denotative definition? The answer is that “rationality” loses too much of its connotative richness when reduced to observable characteristics; and that if rationality is defined with a minimum of tightness, then it is very likely that many human beings would not pass the test of such a definition (and would thus have to be excluded from the class “man”). Conversely, two-leggedness and featherlessness are highly visible characteristics; and this entails that the “symbolic test” (our third defining condition) would only be necessary for marginal

cases (e.g., in order to exclude apes). Let it also be noted that I have chosen Cassirer’s characterization (symbolic animal) instead of *animal loquax* (speaking animal), because the latter property would compel us to exclude one who is incapable of speech.²¹

We may now revert to *operational definitions*. As their placement in Figure 4.6 implies, I suggest that operational definitions should not be intended loosely (this purpose is already served by denotative and precising definitions) but narrowly – that is, as definitions that restrict themselves to possible *measurement operations* and thus to the properties that lend themselves to actual measurements.²² Note that this narrow acceptance also uncovers the *sui generis* nature of operational definitions, for definitions that involve measurement also involve error and “validity.”

As for *ostensive definitions*, Bertrand Russell (1948: Chapter 2) conceived them as extralinguistic modes of communicating, as mere look-and-see shortcuts. For instance, to understand “round,” look at a billiard ball. In our example, the ostensive definition of man is, “Look, this is a man.” Ostensive definitions are called such because they assume a capacity of abstraction (from seeing a concrete man, one abstracts the concept of man). However, definition by ostension amounts to a “pointing” (from a word to an object) which is, as such, of very thin linguistic substance. This is why in Figure 4.6 we have an incomplete triangle (the base is dotted), and why ostensive definitions are placed below the dotted line. And, once again, the recommendation is to understand ostensive definitions in a narrow rather than in a diluted and overstretched sense. The overstretching becomes unnecessary when, along the meaning–referent relation, we sort out other types of defining.

In Figure 4.6 the central area is left blank. As we know, here we find all the properties or characteristics that are associated with a given concept, that is, its *full* connotation or intension. This overall pool of characteristics may be highly populated. Take, once again, the concept of man. To the observable properties picked out (above) by the denotative definition one may add, for example, characteristics such as these: man is (1) a free agent; and (2) a speaking animal; (3) capable of infinite learning; (4) one that masters nature. Another set of characteristics may focus, instead, on the social, political, and religious nature of man. One will also find in the pool a set of metaphysical characterizations: For example, man is a spiritual animal, endowed with an immortal soul, and so on. Let us say, for the sake of argument, that if a computer were to scan the literature in search of all the characteristics associated with the word man, it would collect hundreds of associated words. An “intelligent animal” (man) may reduce them to, say, 50, and a particularly intelligent man may meaningfully reduce them further by *organizing them in clusters of connotations*.

The question remains whether there are logical differences among the characteristics or properties encompassed by, or associated with, a concept. The reply is yes. The pool contains two kinds of properties – namely (1) *defining properties*, and (2) *accompanying properties* (or contingent, accidental, or variable properties). While this distinction may be difficult to draw in practice, it is an essential one in principle. If too much is declared “true by definition,” empirical research is stultified. Conversely, if the necessary properties are not stated, a word simply does not apply

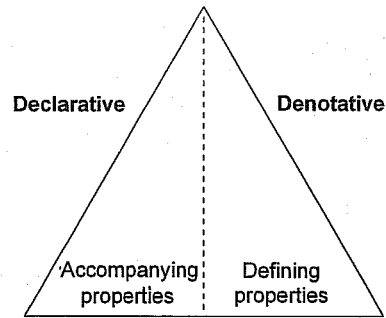


Figure 4.7 Types of definition and defining properties.

– that is, we are unable to decide to what it applies. If “state” is declared not to have necessary or defining properties, we cannot ascertain whether a given entity is or is not a state.

The issue as to which properties are the defining ones will be confronted later (in Reconceptualization”), where I will suggest that within the context of an empirical science, the defining properties are the ones that identify the referent and establish its boundaries. If this suggestion is accepted, then the blank of Figure 4.6 can be filled as in Figure 4.7, which places the defining (necessary) properties on the referential (right) side of our angle. If the suggestion is not accepted or in all the cases in which we are not dealing with an empirical science, the distinction would have to be assessed differently.

It goes without saying that the definitions singled out in this section by no means exhaust the typology of definitions. But our mapping in Figure 4.6 singles out, it seems to me, the ones that are crucial for practitioners and that best alert them to which definitions are appropriate for what purpose. In particular, the social scientist especially needs to realize that he or she is confronted with three distinct definitional problems: first, the *border problem* (to be settled by denotative definitions); second, the *membership problem* (precising definitions); and third, the *measurability problem* (operational definitions which generally hinge in turn on the search for valid indicators).

I was just saying that my typology of definitions is far from being exhaustive.²³ Social scientists are very familiar with, for example, the notions of *lexical* and *stipulative* definitions. While this is a useful distinction, it is being largely overworked and abused. For instance, that lexical definitions are true or false (depending on whether they are actually found in lexicons) whereas stipulative definitions are neither true nor false (since they are mere proposals) is a grand way of stating, at best, a triviality. Lexical definitions are all born, when first proposed, as stipulations; and their general acceptance simply makes them lexical (in no way an addition to whatever true value they might have). We have also come into the habit of saying “I stipulate” simply to say that we select one among the set of definitions carried in lexicons. By saying so, however, we are canceling the distinction that we are employing. Since almost all words are multi-meaning, in order to be lexically

grounded should we adopt all such meanings? Clearly, we always do choose among the lexical meanings – and if this is “stipulating,” then everything is: every definition is a stipulation. In order, then, to have a distinction that carries a difference, a stipulative definition must be a non-lexical one: The two categories are of analytical avail only if employed as mutually exclusive complements of each other.

In conclusion and also to summarize on the route traveled thus far, a concept can be unsatisfactory – either muddled or inadequate – on three grounds:

- 1 Defects in the intension (disorganized or trivial characteristics).
- 2 Defects in the extension (undenotativeness or vagueness).
- 3 Defects in the term (ambiguity).

If so, a complete conceptual and terminological analysis involves three steps. Their logical order is as follows:

- 1 Establishing the connotative definition (by characteristics) of the concept.
- 2 Determining its referents (denotative definition).
- 3 Making sure that the term for it is understood univocally (declarative definition).

Ambiguity, homonyms, and synonyms

Let us now probe our scheme of analysis, beginning with the left side of Figure 4.4 and precisely with the problem of ambiguity, of confusions(s) of meaning(s). These confusions result from homonymy – from the use of a same word for different meanings. The caveat is, thus, that *homonymies are not homologies*, that a same word does not entail sameness of *logos*.

However, even the simple assertion that ambiguity arises from homonyms must be immediately qualified. In the first place, homonyms hardly create ambiguity when they fall into different disciplinary fields. The fact that *canis* applies to a constellation in astronomy and means “dog” in zoology is hardly a matter of concern. It should be understood, therefore, that our concern generally is with within-field or within-discipline ambiguities.²⁴ In the second place, it is important to distinguish between individual and collective ambiguity. *Individual ambiguity* is a single author’s confusion, his own obscurity and/or inconsistency of meaning. *Collective ambiguity* attests, instead, to an infelicitous state of a discipline as such: it is a situation in which (at the limit) each scholar ascribes his own meanings to his key terms. To be sure, individual equivocation worsens collective ambiguity. Yet collective ambiguity can be rampant – to the point of destroying a discipline as a cumulative fabric of knowledge – even if no individual ambiguity subsists. We are confronted, therefore, with two problems that require separate treatment.

The recipe for combating individual ambiguity is no great discovery. Since we have (in mind) more meanings than available words, homonyms are inevitable; and the ambiguity thus resulting can only be cured by surveillance – and this in two steps. First, we must check if and how the key terms (in the subject under

investigation) are defined with respect to the meaning–term relationship – that is, check if and how their meaning is declared; and, second, we must check whether the meaning assigned to a given term is kept constant – whether the same word is actually used, throughout the argument of each author, in the same meaning. In rule form,

Rule 2a: Always check (1) whether the key terms (the designator of the concept and the entailed terms) are defined; (2) whether the meaning declared by their definition is unambiguous; and (3) whether the declared meaning remains, throughout the argument, unchanged (i.e., consistent).

More succinctly (2a and 2b are one and the same rule),

Rule 2b: Always check whether the key terms are used univocally and consistently in the declared meaning.

But what about collective ambiguity? Collective ambiguity does not result only from homonymies; it may also result from synonymies (different words with same meaning). However, before looking into how synonymies relate to ambiguity it is appropriate to consider synonymy per se.

Two preliminary provisos are in order. The first one is that my discussion is not a lexical discussion – that is, it does not bear on lexical synonymies. The lexicographer's unit is a "word entry," and it is his or her business to report on *similarity in meaning* (of words). As Quine (1963: 25) puts it, his definitional activity is confined "to the reporting of preexisting synonymies" – to be sure, of preexisting synonymies that have been intersubjectively accepted. To clear my way, I shall say that lexical synonymies are givens, and that I take them, as everybody generally does, for granted.²⁵ The logical point is that "similarity" in meaning is a far cry from "sameness" in meaning²⁶ and, moreover, that a synonymy of words has little to do with establishing a *conceptual synonymy*.

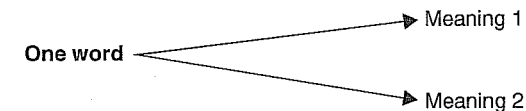
Let us now move from the word (as the unit) to the sentence (as the unit). In this case we speak of *synonymity sentences*; and the proviso is, again, that much of this activity is irrelevant to our concern. For instance, sentences that take the form "we shall use the terms A, B, and C indiscriminately or interchangeably" simply attest to how sharp an analysis needs to be and point to what is peripheral to the analysis at hand. Likewise, most sentences that take the form "means the same as," or "this is the same as saying," simply pick up lexical synonymies and are, generally, context-embedded: they do not entail in any way, and certainly do not suffice to demonstrate, that two concepts have the same meaning. The question thus becomes, when is it that a synonymity sentence establishes or purports to establish a *conceptual synonymy*?²⁷

When this is the case we say (or intend to say) that the "true meaning," the "correct meaning," or the "proper meaning" of A is x. These expressions, let it be stressed, do not necessarily reflect an ontological or metaphysical conception of language. They may simply and appropriately reflect the fact that a semantic

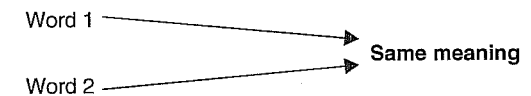
universe is a system structured by rules of meaning which are, for all practical intents and purposes, givens. (To call them "conventions" engenders a naively anthropomorphic and misleading interpretation.) Thus, a correct meaning is a meaning that complies with these rules, while an incorrect (wrong) meaning violates them. And this is what we endlessly discuss under the form of *interpretative sentences*²⁸ – that is, sentences that address, in the final analysis, the issue as to whether a word is used according to the rules of language or not. So far, so good. That is to say, if two terms are given the same meaning via interpretative sentences, synonymities are, in principle, unimpeachable. But are all synonymities (of terms) so established? The reply is that this has been less and less the case under the aegis of the very convenient dictum that "all meaning is arbitrary" and, if so, that we are free to define as we wish (i.e., to freely stipulate meanings). But a synonymy that is not warranted by interpretative sentences is an *arbitrary synonymy*: a synonymy that is simply declared, without further ado, in the name of freedom of stipulation.²⁹

Having brought out the point of controversy, or the sore spot, let us pass on to the overall relationships between homonymy and synonymy.

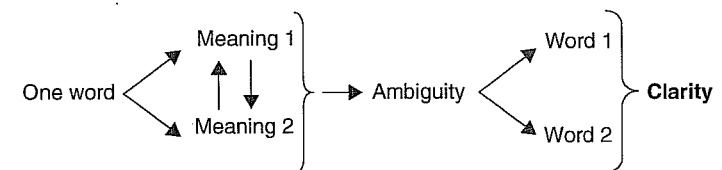
Homonymy (one word–many meanings) obtains this relation:



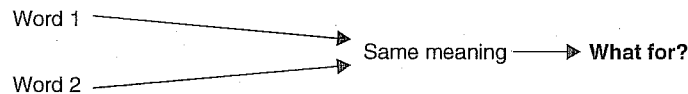
Synonymy (many words–one meaning) obtains the reverse relation:



Now, let us assume that a homonymy is confusing, that it produces ambiguity. (Note that I am not assuming that a natural language should resemble, ideally, a predicate calculus. One can fully appreciate the virtues of the polysemantic richness of words and yet combat, at critical junctures, its drawbacks.) In that case, the golden rule is to have one word for each meaning, as follows:



If the same scheme is applied to the case of synonymy, the difference is that the end result is indeterminate, as in the following representation:



To be sure, there are many good answers that one can give to the above “what for?” For instance, that entities should not be multiplied; or that one kind of “explanation” consists precisely in demonstrating that A is nothing other than B (and thus that two terms are synonymous).³⁰ Moreover, as I have previously pointed out, most synonymies are lexical givens – and that is that. The point remains that synonymies are not simply the reverse of homonymies – they bring up the question, what is their merit? If we break down a homonymy, the worst that can happen is to propose a trivial distinction, a distinction with no difference: the sin, if any, is of little consequence. Contrariwise, if a *conceptual synonymy* is not demonstrated in accord with accepted and controlling procedures (not only interpretative sentences but, as we shall see, the “semantic field rules” formulated in “Selecting the term within a semantic field”), then we are apt to incur a sin of very great consequence: the sheer *unsettling of a semantic field*. Indeed, the best indicator of *stipulative arbitrariness* is that it unsettles, *without resettling*, the semantic field to which the stipulation belongs.

But this argument is premature at this stage. For the time being, the fact that synonymy is a risky affair and that its eventual demerits are of no small consequence warrants two caveats – one very general, and one very specific.

The general caveat about giving the same meaning to different words is that this appears to be, in the aggregate, a *terminological waste*. That is to say, that from the vantage point of what may be called economies of language, synonymies should not be encouraged for they add up, on balance, to providing “fewer words” which are in turn burdened with “more meanings.” The specific caveat is that collective ambiguity is generated by and is the inevitable outcome of *stipulating synonymies at whim* – by now a widespread practice in the social sciences. To this effect, at this stage I shall simply note that any synonymy that is stipulated without adequate “interpretative support” (in terms of interpretative sentences) should be refused. At a later stage, however, I shall indicate (under Rules 8 and 9) a crucial test condition, or controlling procedure.

With respect to the first caveat (that is, to the problem of *terminological waste*) the recommendation is to make sure that synonymies do not hamper the articulation of language. This recommendation can be expressed under an “awaiting contrary proof” clause (that implies that a net advantage should be demonstrated), as in the allowing rule form:

*Rule 3a: Awaiting contrary proof, no word should be used as a synonym for another word.*³¹

Rule 3b: With respect to stipulating synonymies, the burden of proof is reversed: what requires demonstration is that by attributing different meanings to different words we create a distinction of no consequence.

As can easily be seen, the difference between 3a and 3b – the anti-waste rule – is simply that the latter formulation spells out the clause “awaiting contrary proof.” Let it also be stressed that Rule 3 should be interpreted with a grain of salt. The crucial reminder is that my concern is about *conceptual synonymy* (not about lexical or sentential synonymies). This means, in practice, that Rule 3 does not apply to that which is peripheral to an investigation: it is intended only for the core of what is being investigated. It is appropriate to conclude on the point with a note of caution. Even when we encounter “accepted synonyms” (givens) their identity-similarity of meaning can be accepted if (and only if) it passes two tests, namely: (1) sameness of the major meaning component of different words, and (2) sameness in the value connotation (whether a word is evaluative or neutral) of different words. For instance, if political class is neutral and if political elite is either appreciative (in past usage) or derogatory (in recent usage), then the two words are not synonymous: their extension can be the same, but their intension is not (evaluatively). Likewise (this was Hobbes’s favorite example) “regicide” and “tyrannicide” may both denote the killing of a same person; yet tyrannicide renders lawful and laudable a regicide (i.e., the unlawful act of killing a king). Again, while the denotation of the two terms may be exactly the same, they are not synonyms for their evaluative connotation is different.

I have left out or to the very end the obvious recipe for combating ambiguity in general – namely, *neologisms*. The point here is a very simple one. The remedy of creating new words is excellent in principle, but fails in practice – unless three conditions are respected: parsimony (few inventions), gradualness (few at a time), and, possibly, easy intelligibility. Maybe we should combine – in a strategy of reciprocal correction – neologisms with “neovalents” (a new meaning given to an existing word). A neologism involves a memory cost, but is (in its very reason for being) unequivocal. Conversely, a neovalent adds to the ambiguity of a word but has no memory cost. The recommendation is, thus, to accompany the more equivocal but familiar form (the neovalent) with the more forgettable but unequivocal form.

Organizing the intension

It will be recalled that a concept *is* its intension, for the intension (or connotation) encompasses all its characteristics or properties. From this starting point the query is this: how do we handle a maze of characteristics and, to begin with, how do we know which are these characteristics?

In order to reply a distinction must be drawn between (1) reconstructing a concept, and (2) forming a concept. In reconstruction we are interested in canvassing the history of a concept (if it happens to be an old one) and in assessing its current state in the literature. In the perspective of formation, we formulate instead *our* concept and, it is hoped, an improved concept. Here we shall dwell on the reconstruction under the assumption that it should precede the formation and indeed that a prior reconstruction helps concept formation. So, the first question is, how do we know which are the characteristics, properties, or attributes of any given concept? Scholars find this out by searching in the pertinent literature for the definitions that

are given of a concept. On this simple consideration, let me immediately submit the rule that applies to the reconstruction of a concept, as below:

*Rule 4: In reconstructing a concept, first collect a representative set of definitions; second, extract their characteristics; and third, construct matrixes that organize such characteristics meaningfully.*³²

Rule 4 is deliberately (and by necessity) loose because it is simply intended to call attention to the fact that the process of reconstructing a concept requires, at a minimum, three steps: first, the canvassing and listing of existing, authoritative definitions; second, the clustering and transformation of these definitions into a set of extracted characteristics; third, a matrix (or matrixes) that organizes on the basis of meaningful criteria the characteristics so extracted. It is probably vain, I believe, to search for standard patterns for our matrixes. Different concepts (or concepts subjected to different treatment – e.g., “property concepts” versus “object concepts”) are likely to require different organizing matrixes left to the perceptiveness and ingenuity of the analyst. Maybe we can go beyond mapping devices and eventually land at full-fledged “conceptual trees.” The argument is only, then, that a reconstruction is incomplete and loses much of its fruitfulness unless it leads, at a minimum, to an organization of characteristics that somehow compounds the similarities and the differences in how a given concept is conceived.³³

A comment is appropriate with respect to the first recommendation of Rule 4: “Collect a representative set of definitions.” This formulation applies, as such, to relatively recent concepts (e.g., culture, ideology). With respect to old concepts (such as alienation or power), the set must also be representative historically – that is, historical depth and sequencing appear to be an important thread. This preliminary canvassing involves three aspects: (1) establishing the etymology; (2) following the *Geistesgeschichte* of the word; and (3) a text analysis of key authors or sources. Regardless of how we go about collecting definitions, the essential part of the exercise consists of *extracting the characteristics*. One can find more than 50 definitions of “power.” However, all these definitions exhibit, in various combinations and shades, a far smaller number of characteristics. And when we come to the core characteristics, I surmise that very few concepts would display as many as, say, ten.

Undenotativeness (vagueness)

We may now turn to the extension or to the denotation – that is, to how the meaning relates to the referent. Along this side of our scheme of analysis the problem is *denotativeness*, and the defect has thus been labeled *undenotativeness*. With respect to the referent, the basic question is, which objects or entities are included and which are excluded? As we have already seen in our mapping of definitions (“Defining” and Figure 4.6), this question can be underpinned in three different directions, namely:

- 1 Boundary indefiniteness.
- 2 Membership indefiniteness.
- 3 Cut-off indefiniteness.

The boundary problem is, we may say, the “sine qua non” problem. Boundary indefiniteness results from, or can be imputed to, insufficient characteristics in number – other conditions being, of course, equal.³⁴ That is to say, that a concept is unbounded (no matter how well we perform otherwise) when it is not given a sufficient number of characteristics for identifying its referents with respect to all their boundaries.

However, the boundaries may be drawn and yet we may remain confronted with a “fuzzy set,” with membership indefiniteness. When we complain – as we very often do – that a concept does not have a sufficient discriminating power, it seems to me that this complaint is particularly appropriate when it addresses the membership problem. To illustrate with reference to “elite”: the concept is defective with respect to its boundaries when it fails to sort out elite as a distinct kind of group; and is defective with respect to its membership when no within-elite “precising” is possible.³⁵ The latter is the problem – we have suggested in “Defining” – that is specifically addressed by precisizing definitions. Let us now say that precisizing definitions are intended to provide or increase a within-concept discriminating capability. The foregoing can be summarized in rule form as follows:

Rule 5: With respect to the extension of a concept, always assess (1) its degree of boundlessness, and (2) its degree of denotative discrimination vis-à-vis its membership.

While there is a difference between boundary vagueness and membership vagueness, both defects are amenable to the same cure, as in Rule 6:

Rule 6: The boundlessness of a concept is remedied by increasing the number of its properties; and its discriminating adequacy is improved as additional properties are entered.

The rationale of Rule 6 will be explained in the next section (and by Rule 7). The objection could be that increasing the number of properties is not enough in the sense that what is also and concurrently involved is the “sharpness” of the characteristics in question. I concur, but I do not know how to handle this problem any better than I have done in “Organizing the intension.” Allow me simply to specify, therefore, that my Rule 6 applies under the following *ceteris paribus* clause: provided that the sharpness of our characteristics is equal, then vagueness of boundaries and/or of membership becomes a function of the number of the properties.³⁶

We are left with the cut-off indefiniteness. The boundaries may be well drawn conceptually, and yet the researcher on the field may still be in trouble. At this point his trouble will be of a residual kind, to be formulated as follows: despite adequately drawn conceptual frontiers, we must ask which marginal entities or

borderline entities are to be included or excluded. Take, again, the elite example. The membership problem may have been resolved according to Rule 6, and yet the researcher may still have to decide how to sort out all the concrete groups that should either be included or excluded. To cite another instance, with “political party” where is the cut-off point? Failure to achieve representation? At 2, 3, or 5 percent of the total vote? A given percentage in seats? And when does a hill end and a mountain begin? At what point is a city a city?

The borderline problem cannot be settled in general. I mention it for two reasons. The first one is that much can be done about “membership indefiniteness” before coming to the cut-off point, and this implies that the two things should not be confused. The second reason is that the inclusion-exclusion of marginal entities is, conceptually, a residual issue. No doubt, it troubles the researcher; but it does not arise until we come to operationalization. That is to say, that it is a problem to be settled by operational definitions. On the other hand, the more theoretically oriented scholar may prefer to speak, in this connection, of the *open texture* of concepts.³⁷ And the idea that concepts are so characterized does not displease him at all. Quite to the contrary, open texture is often conceived as a conceptual asset.

Ladder of abstraction and universal concepts

Up to this point we have not touched explicitly upon the vertical organization of knowledge. The classic instance of vertical organization is given by hierarchical classifications of the *per genus et differentiam* type: genus, species, subspecies.³⁸ However, hierarchical classifications are only a special case of a more general structure that is generally identified as a difference in *levels of abstraction*.

We are all aware of the fact that the theorist performs at a higher level of abstraction than the researcher; and we are even more aware of how poorly our theory generally relates to our research (and vice versa). This is so – I submit – because we do not know how to descend or, conversely, how to climb along a *ladder of abstraction*. This is tantamount to saying that from a logical standpoint the problem is to convert a discrete and often messy superimposition of levels of abstraction into a ladder of abstraction – that is, into orderly rules of transformation (composition and decomposition) from one level to another.³⁹ To this latter effect, the rule of thumb seems to be that we climb a ladder of abstraction by reducing (in number) the characteristics of a concept. Conversely, we descend a ladder of abstraction by augmenting (in number) the characteristics of a concept. In rule form:

*Rule 7: The connotation and the denotation of a concept are inversely related.*⁴⁰

As already noted, the inverse relationship between connotation and denotation provides a rationale to our previous Rule 6 – namely, that the undenotativeness of a concept is remedied by increasing the number of its extensional properties. It can now be seen that Rule 6 belongs to the broader context of how theory (i.e., a high level of abstraction) relates to field research (i.e., a low level of abstraction). The denotative and discriminative power of a concept is increased by increasing its

properties, because this is how we descend a ladder of abstraction in order to meet research (and verification) needs.

Clearly, a concept can be (and indeed is) treated by different authors at different levels of abstraction. If so, Rule 7 helps us in reconstructing into one concept what may appear as a congeries of concepts. On similar grounds, the notion of levels of abstraction alerts us to a possible way of organizing our matrixes of characteristics (“Organizing the intension”).

Rule 7 also enables us to underpin the strength and the weakness of the all-inclusive, highly abstract concepts philosophers call, or have called, *universals*. Any concept can be “universalized” in this sense: whenever it obtains the most inclusive definition it can (semantically) obtain.⁴¹ For instance, the universal definition of republic is any form of state which is not monarchic. While this definition is all-inclusive (no state qualified as republic would be missed), it hardly is very telling, (i.e., non-monarchic is not a very interesting characteristic). Yet, the “entry” into a discourse about republics or the “genus” for classifying republics into species and subspecies is afforded by the universal definition.

While each concept has its own upper limit (some concepts are “more universal” than others), under this proviso it can be generally said that universals are nothing other than what remains of a concept at its highest level of abstraction. According to Rule 7, this means that the ladder of abstraction has been climbed to the point at which a concept is connoted by only one characteristic. This is so because in order to extend the denotation we must reduce the connotative characteristics; and the denotation of a concept reaches the point of all-inclusiveness precisely when all its characteristics but one have been removed. For instance, “group” becomes a universal when defined, “any collection of more than two individuals” (where more-than-two is the only remaining characterization).

Universal concepts (as defined above) are looked upon with suspicion by empirically oriented scholars. However, they too can hardly perform without them. They will argue – with reason – that highly abstract concepts are of no avail on research and testing grounds. Nonetheless, a highly abstract concept may turn out to have a high explanatory or heuristic value; and, in any case, universals do serve mapping and organizational purposes. Universal concepts are often thought of as being hopelessly imprecise. If this means that they are necessarily ambiguous, this charge cannot be sustained. A universal concept need not be ambiguous, for the one characteristic that it retains may be expressed and defined unequivocally. Yet Rule 7 implies that a universal concept must be, in some respect, *defective in denotation*.⁴² This necessarily follows from the abstractive (ladder climbing) process: When we are left with one characteristic only and when this characteristic is selected precisely for its all-inclusiveness (or greater inclusiveness), the other side of the coin is that we are left with poor boundaries and/or with poor discriminating power. Conversely, the more we descend the ladder of abstraction by entering additional characteristics, the more a concept obtains boundaries and denotative discrimination (thereby suiting the needs of the researcher).

Of course a universal concept can be, all in one, ambiguous and utterly undenotative. Take again, to illustrate, the concept of group in the “group theory” of

politics of David Truman et al. In order to be a universal key, "group" was conceived in the 1950s as any significant interacting unit resulting from the aggregation of two or more (up to billions) individuals. And even this characteristic ("any significant unit") was destroyed by the introduction of so-called latent or potential groups. At this point the universal is indeed universal, but its boundlessness is staggering; and to use "group" to mean any amount of individuals serves no purpose other than the one of unsettling the semantic field to which the term belongs.

The reconstruction of concepts

In "Organizing the intension," I pointed out that our major reason for dwelling on the intension of a concept is that we are interested in reconstructing it. However, the reconstruction of concepts was left (in Rule 4) at the recommendation of constructing matrixes of characteristics. This is indeed the most crucial part of the exercise; but we still have to confront the complexities of a full-fledged reconstruction.⁴³

The rebuilding of a concept begins with looking into its literature. Here, the referent is library "references." It is only to be expected, therefore, that the extraction of the characteristics (from our list of definitions) will leave us with a sheer enumeration of characteristics that appears intractable: we simply see no way of bringing this enumeration together into some meaningful kind of organization. In order to grasp the nature of the difficulties that might confront us at this juncture, it is helpful to imagine – as in Figure 4.8 – some typical configurations of characteristics. Note that the figure is merely illustrative. As for its interpretation, a circle indicates a cluster of characteristics that are internally congruent, that hang together; overlapping circles indicate clusters of characteristics that can be derived from one another; and isolated circles point to the most intractable configuration. The circles are included in boxes that represent the pool of all the conceivable connotations of a concept.

The configurations in boxes (a) and (b) are, for our purposes, the more pleasing ones. Under box (a) we have a common core of characteristics (the shaded area), three adjacent areas of overlapping, and a periphery that poses, as it stands, no problems. Under (b) we have, instead, a central common core that originates strings of characteristics that go in very different, mutually independent, and yet connected (string by string) directions.⁴⁴ The trouble begins when we obtain a configuration as under (c), for here we do not seem to have a common core, and the interconnections

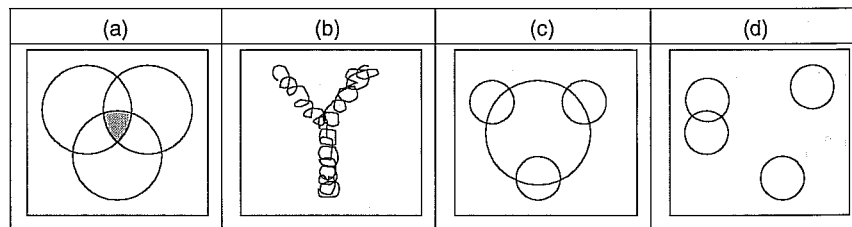


Figure 4.8 Possible configurations of characteristics.

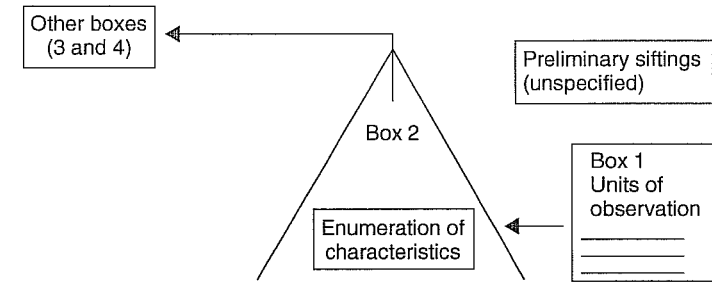


Figure 4.9 Ordering of definitions (input side).

between the four circles (clusters) are difficult to establish. And, of course, the worst possible configuration is the one under (d). So, we may be in trouble. If we are, should we lift our arms in despair and simply conclude that the concept under investigation is a morass, an impossible mess, or a bottomless swamp? Not at all – and surely not yet. Let it be stressed that here we are reconstructing a concept *from its literature*. This suggests that a first sifting must occur before we enter our standard scheme of analysis (as we have left it in the initial figures). Let us thus expand the right side of the scheme, as in Figure 4.9.

What does Figure 4.9 convey? Very simply, that the disorder (intractability) in box 2 – our overall pool of characteristics – might well depend from a disorder in input: that is, from having neglected to order, in a preliminary way, the set of definitions from which we subsequently extract the characteristics. In box 1, the suggestion is specifically pinned down to a criterion – namely, which is the unit observed by each author and thus reflected in his definition? For instance, if the concept of power is focused on the unit "diadic relationships," it will be conceived differently than when the unit is a "one-to-many" relationship. Likewise, the integration of the unit "household" is not the integration of the unit "nation." And so forth. What is recommended as a first step is, then, to ask the following question: power, integration, alienation, consensus, culture, and so on, *with respect to what?* That is, with respect to which unit of observation and/or analysis? And if this question or other siftings of the kind⁴⁵ are asked on the entry side of our scheme, it may well be that also the characteristics assembled in box 2 (the domain of the intension) fall into place. But let me continue to play the devil's role. Let us assume that box 1 does not bring any order into box 2. What next? The subsequent steps, that may be called – for the symmetry of the argument – steps in output, are outlined in Figure 4.10 under the general heading of "contexts."

Figure 4.10 suggests that our inability to find any order in box 2 may also depend on the fact that a concept adapts itself to, or is changed by (1) the *disciplines* (political science, sociology, anthropology, economics, psychology, etc.) within which it is developed, and/or (2) the *theoretical contexts*, frameworks, and approaches (e.g., cybernetics, decision making, functionalism, structuralism) that employ it. Figure 4.10 also allows a box for field contexts – that is, for within-discipline slicings (such as comparative versus non-comparative).

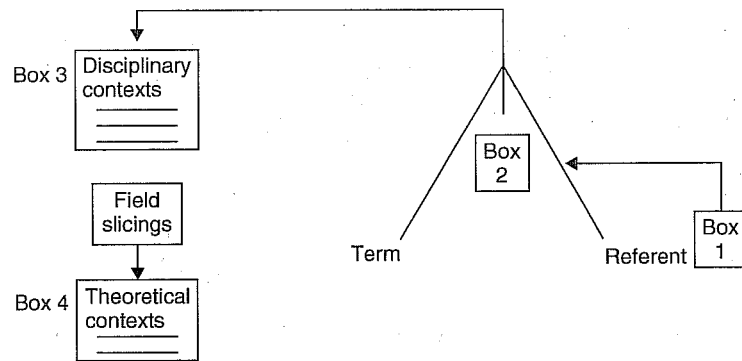


Figure 4.10 Ordering by concepts (output side).

The question, or the objection, might be this: why are disciplinary and theoretical contexts treated in my sequencing as a last resort fitting? I grant that – in principle – all four boxes could be placed on the entry (right) side of the scheme. However, I have reasons for placing them where they are. First, it is impractical and confusing to clog the entry with too many siftings. Second, the “unit of observation” criterion is a neat one, whereas disciplines and theoretical contexts are, as criteria, very untidy ones. Let us, therefore, check first how much mileage is afforded by our best sorting device. Third, and in particular, passing references to “theoretical contexts” appears to be a very convenient alibi for unfinished jobs or (still worse) issue-escapism. In any event, I am interested in finding out to what extent the social science “theoretical contexts” really do affect our conceptualizations.⁴⁶ So, let us see first how much of the variance is explained by the previous boxes.

A final reflection is in order. A “real science” does not devote any special attention to concept reconstruction. The need for *reconstruction* results from *destruction*, from the fact that our disciplines have increasingly lost all “discipline.”⁴⁷ Amidst the resulting state of non-cumulability, collective ambiguity, and increasing incommunicability, it is imperative to restore or attempt to restore the conceptual foundations of the edifice. This is not to say that an exercise in conceptual reconstruction will restore consensus – we are far too disbanded for that. However, if the exercise succeeds, it will restore intelligibility – and, with intelligibility, an awareness of the enormous intellectual waste brought about by our present-day indiscipline (and methodological unawareness). This is why I insist on the reconstruction of concepts. But, of course, this is not an end in itself.

Concept reconstruction is a highly needed therapy for the current state of chaos of most social sciences. Moreover, it helps each individual scholar in deciding what to do on his own. Unless a reconstruction precedes the construction, he is not only liable to waste time and energy in rediscovering the umbrella (I mean something already discovered) but also to add a “meaning 51” to some other 50 preexisting meanings, thus adding, at best, profusion to confusion. Nonetheless, the fact remains that concept reconstruction is a means whose ultimate purpose is to provide a cleaned-up basis for construction – that is, for the *formation* of concepts.

Forming the concept

Since the reconstruction has involved us in a somewhat distracting detour, it is important to recall – with reference to the initial scheme of analysis – that also the formation of the concept hinges on the distinction between the meaning–word problem (ambiguity), and the meaning–referent problem (undenotativeness). The point concerning ambiguity is that “many meanings in one word” are conducive to equivocations. In order to minimize them, the golden rule (incorporated in my anti-waste Rule 3) is that “different things should have different names” – as much as is possible, of course. Hence, stipulating synonymies without proof – that is, in disregard of the “burden of proof” clause – is both a waste of language and a way of aggravating ambiguity. Undenotativeness, instead, cannot be condemned as such. It points, true enough, to some kind of empirical weakness of a concept. But this may simply mean that an author is a theorist, that he is not concerned with the extension, denotation, and, in the final analysis, operationalization of concepts. There is nothing inherently sinful in that.

Even so, how we cure vagueness or undenotativeness (as handled by Rules 5 and 6) remains an important question – also for the theoretically oriented scholar. This is so because nobody ever really addresses a concept by asking, what are *all* its conceivable characteristics or properties? The empirically oriented scholar asks, Which are the apt and sufficient properties for marking the boundaries? His problem, as we have phrased it at the outset, is to seize the object. As for the theoretically oriented scholar, he may well want to do more than seize the object. Yet it will not harm him to do so.

On the basis of the foregoing, which is the next step? We are seemingly close to the point at which we are in a position to decide, on warranted grounds, the designator of the concept – that is, the *allocation of the term*. This is a very crucial step because “terms” are the carriers of the stability of language and of the cumulability of knowledge. Moreover, when we settle for a given term (the term that designates the concept) our selection has a *semantic projection*, and this means – as we have seen at the onset – that our choice entails a way of conceiving and perceiving (things or processes). It is precisely because language is not only a means of expression but also a *molder of thought* that allocating the term to a concept – terming the concept – is a most central decision.

Selecting the term within a semantic field

How do we go about, then, selecting the term that designates the concept? The reply crucially hinges on the fundamental notion of *semantic field*. A natural language in its entirety is – I have said – a semantic *system*. But we cannot involve, when we deal with a single concept, the entire linguistic system. If this were the case, the undertaking would be unmanageable. However, a linguistic system can be conveniently broken down into manageable subunits, into relatively small semantic fields.

A semantic field should not be confused with Wittgenstein’s “family resemblances.” While it consists of a clustering of terms, it remains a subsystem of the

overall linguistic system and, therefore, it remains characterized by *systemic properties*. A semantic field is, then, a clustering of terms such that each of its component elements interacts with all the others, and (as with all systems) is altered by any alteration of the others. In other words, a semantic field consists of a set of associated, neighboring terms that *hang together* under the following test: when one term is redefined, the other terms or some other term also need to be redefined.⁴⁸ The notion of semantic field entails, then, that the selection of the term that designates the concept must be submitted to the following rule:

Rule 8: In selecting the term that designates the concept, always relate to and control with the semantic field (to which the term belongs) – that is, the set of associated, neighboring words.

Let the above be called the *semantic field rule*, and let me dwell on it via examples. First example: the term that designates the concept is *elite*, and the set of neighboring words is, at a minimum, aristocracy, oligarchy, ruling class, political class, power class. Now, if elite is not defined as required by the anti-waste rule (Rule 3), then we shall find in all likelihood assimilations such as elite is nothing other than power class (those in power). If so, Rule 8 requires us to readjust the whole semantic field, and particularly to make sure (1) that no meaning is cancelled when the word elite swallows another member of its set, and/or that (2) by declaring a synonymy (e.g., that elite and power class have the same meaning) we do not, in fact, increase the ambiguity of the concept.

Second example: the term allocated to the concept is *power*, and a first set of associated words is influence, authority, coercion, force, sanction, or even persuasion. Now, if Rule 3 is respected, Rule 8 does not apply. But if the anti-waste rule is disregarded, then we shall probably end up with assimilations such as power is influence, and influence is power. If so, Rule 8 requires us to resettle the semantic field in such a way as to show (1) that power is not coercion (since it is influence), (2) what is influence without power (surely a conceivable possibility), and (3) how we relate power-influence to authority, force, and sanction. At the end, we are likely to discover that any assimilation has a “field cost”: it obfuscates, in part or totally, the rest of the set.

Third example: the designator of the concept is *ideology*, and here the associations indeed loom large because they touch on idea, doctrine, theory, science, belief, affect, value, creed, myth, utopia, truth and cognition, class interest, and more. In this instance my own experience is that Rule 3 and its “awaiting contrary proof” clause is decisive; it is its incessant violation that has reduced “ideology” to a morass.

The foregoing illustration suffices, I trust, to sustain the following sub-rule of practical implementation:

Rule 9: If the term that designates the concept unsettles the semantic field (to which the term belongs), then justify your selection by showing that (1) no field meaning is lost, and (2) ambiguity is not increased by being transferred into the rest of the field set.

This semantic field rule is by no means intended as a reconceptualization blocker.⁴⁹ Quite to the contrary, the ultimate purpose of our guidelines is to sustain concept formation. But a reconceptualization cannot consist of a single-shot stipulation. Not only must we confront the “unsettling costs,” but the merit of a reconceptualization consists precisely in demonstrating that the resettling advantages *for the whole field* largely outweigh these costs.

While the crucial considerations for “terming of the concept” are given by the semantic field Rules 8 and 9, a concomitant, expedient way of assessing whether a concept is ill-termed (or could be termed better) is provided by what I shall call the *substitution test*. The substitution test may be formulated as follows: if, in any given defining sentence(s) the word A can be substituted by the word B not only without alteration of the presumably intended meaning but indeed with a gain in clarity and/or precision, then the word A is being misused or inappropriately used. This test is well illustrated by F. W. Riggs in his analysis of the concept of development, and consists (in the semantic field under scrutiny) of taking a series of definitions of “development” and of substituting, in such definitions, the word development with other neighboring words, such as “change,” “growth,” “expansion,” “modernization,” “progress,” and many more. It turns out that in a number of instances the definitions so tested become clearer (less ambiguous) when “development” is substituted with another word that conveys a more precise meaning of what the author seemingly intends.⁵⁰ To say the least, the substitution test shows that fashionable words may only add to obfuscation, or that whatever improvement in conceptual clarity is brought about at the outset is subsequently lost when popularity turns a word into sheer verbiage. Let it be stressed, however, that while the substitution test is a most useful and expedient *test* (i.e., detector of abuse and sloppy usage) it cannot replace – as a guide for concept formation – the semantic field rules.

Reconceptualization

I have insisted on the allocation of the term because it prejudices (semantically) what follows – namely, *reconceptualization*, the definition that formulates and forms the concept, our conclusive step.

Does concept formation, as defined, amount to “legislating” over concepts? This is often said, and often used as a scare word or as an indictment. But legislating is a wrong word. (Remember that semantic systems do entitle us to dispute the correctness of words.) If “legislating” conveys, as it does, that somebody imposes and enforces something upon someone else, then the word misrepresents the process of knowing – as I shall stress in the final section. For the time being, let me simply note that the reconceptualizing that I recommend is different from the one in which everybody is engaged all the time in one respect only – that it is guided (it is hoped for the best) by methodological alertness and procedural rules.

There appear to be two pathways to concept formation that owe their distinctiveness to the fact that each science actually consists of two component parts: the pure science (theoretically oriented), and the applied science (research-and

testing-oriented).⁵¹ In the pure science precedence is given to the *theoretical fertility* of a concept, whereas the applied science must give precedence to the *empirical usefulness* of a concept, that is, to its extensional or denotational adequacy. While these two orientations are not mutually exclusive – a scholar can be equally sensitive to both – the bearing of the point is that it is perfectly legitimate to end up either with a definition of theoretical import, or with a definition of empirical utility. And while I have no recipe for theoretical fertility, empirical reconceptualization remains, instead, amenable to rules.

As we already know from “Defining,” the crux of defining consists of separating the *defining properties* (or necessary characteristics) from the *accompanying properties* (contingent or accidental characteristics). The defining properties (carried in defining sentences) are *true by definition*; this entails that a concept without defining properties, or necessary characteristics, cannot be applied with any certainty and consistency.⁵² The contingent or variable properties are the ones that may, but also may not, accompany the object (entity, process, relation) being defined; and this implies that their presence must be ascertained by investigation – not declared to exist by definition. Our current neglect or even rejection, in the social sciences, of defining is ominous; yet it finds a justification in previous abuses, in the malpractice of outflanking problems by solving them “by definition.” But this malpractice attests only to the difficulty of sorting out the necessary from the contingent characteristics.⁵³ The point remains that what must be settled by definition cannot be settled by investigation; and, conversely, that what can be settled by investigation should not be settled by definition.

The crucial question thus is, How do we decide which characteristics belong to the defining properties? With respect to empirical knowledge (not in other domains and respects) I answer: *defining properties are those that bound the concept extensionally*. To illustrate, if the ability to fly were considered a defining property of birds, then an ostrich could not be classified as a bird. As a consequence, either we unsettle (and resettle differently) the criteria according to which zoologists classify all living beings, or we must make “ability to fly” an accidental, if very frequent, property. Note that a minor borderline problem relating to marginal entities (mainly ostriches and turkeys) wins over the visible property that most people would consider the characteristic of birds. So, the defining properties are the bounding ones – not the most frequent or ostensibly obvious ones.

This is, then, the *logic of defining* that social scientists have long forgotten. What has come to replace it is the recommendation of *parsimony in defining*. I do concur with this recommendation. Yet parsimony is no guide – it remains an exhortation without content, unless it is spelled out as follows: confine your defining to the necessary properties. And the same applies to the concurrent recommendation of settling for *minimal definitions*, for definitions that leave the maximum conceivable room to findings. Again, in order to be of guidance “minimal” must be specified as follows: exclude from your defining the accompanying properties. And if this is the case, then the practice-oriented rule derived from the logic of defining can be formulated as below:

Rule 10: Make sure that the definiens of a concept is adequate and parsimonious: adequate in that it contains enough characteristics to identify the referents and their boundaries; parsimonious in that no accompanying property is included among the necessary, defining properties.

Clearly, the rule satisfies the requirement of empirical adequacy, not the requirement of theoretical fertility. With respect to the latter, I must leave the argument by noting that after a conceptual reconstruction we are likely to be far better equipped than otherwise for looking into the characteristics that serve the advance of the “pure science.”

At the end of our “guideline journey,” it is appropriate to ask: should we say, by way of conclusion, that *a concept has many meanings*, or instead that *each one of these meanings is a concept*? The first way of putting it implies that we are reporting on how a discipline as a whole stands on any given concept. The second way of putting it appears more accurate,⁵⁴ but may not help a discipline in trying to restore common conceptual foundations. All things considered, I suggest that both formulations are permissible if understood with a grain of salt. Since my overarching concern is with counteracting chaos, my preference is to say that a concept has many conceptualizations.⁵⁵ But this statement is in no way intended to contradict the statement that each conceptualization is a concept.

It is also appropriate to stress, at this point, that guidelines are simply guidelines. The adoption of a *core method of analysis* and of replicable analytic procedures is necessary for a joint, incrementally oriented endeavor. But a modicum of discipline is not inimical to variations and inventiveness. Indeed, variations and inventiveness are an essential part of the exercise. In this connection it is well to note that my guidelines owe little to the philosophy of science literature and to the resulting methodology. The model of the current philosophy of science is (with exceptions, to be sure) physics. Unfortunately, there is very little in such a model that social scientists are able to imitate or even to approximate. As a result social science practitioners are taught what they do not need to know, and are not told what is needed for their own knowing. In order to fill this gap I have in fact worked back from the science (as we are best able to practice it) to the method. That is to say, that my guidelines are largely extracted from the problems that the social scientist actually confronts. This entails, in turn, that the method outlined in this writing is monitored by and fully open to feedback. If, along the course of concrete conceptual analyses, worthy reasons are given for dismissing a particular rule, it will have to be dismissed. If, on the other hand, the concrete analyses come up with better and/or different rules, they shall have to be incorporated. As more and more analyses of concepts are performed, they will not only engender a more sophisticated method but may also suggest alternative methods. As I was saying, variations and inventiveness are no less necessary to our endeavor as a modicum of discipline. But a method we must have.

Fallacies: a coda

It is an easy prophecy that what is being proposed here will be challenged from a variety of quarters. Some of the foreseeable objections have been implicitly

accounted for along the way. Even so, it is well to explicitly bring them together. It is also the case that many of the foreseeable objections can be neatly dismissed as fallacies – or so I believe. There is no particular ordering in the fallacies that I am about to expose, except that the simpler ones are introduced first. Let it also be understood that when a fallacy is brought back to the major author under whose authority it is held, my quarrel is not necessarily with the author itself but, more often, with a false witnessing.

The language-in-use fallacy

One of the celebrated dictums of Wittgenstein is that “the meaning of a word is its use in the language” (1953: 43). The dictum is easily extended to concepts. If so, it cannot be left at that. To which “language use” should we bow? To the one of ordinary language? Much of the analytic and linguistic philosophy inspired by Wittgenstein has in fact followed this cue. To the extent that this is so, however, the philosophers in question have segregated themselves from any understanding of how a scientific knowledge is formed and actually develops. Whatever else “science” may be, its necessary, preliminary condition resides in the formulation of a *special and specialized language* (not to be confused with a calculus or a formalized language) whose distinctive characteristics are precisely to correct the defects of ordinary language. The various sciences – both the hard and soft ones – took off by inventing neologisms (their own technical vocabulary), by reducing by definition the ambiguity of their key terms, and by consistently abiding by syntactical rules. What is the relevance, then, of Wittgenstein’s stand for the realm of science? The reply either is absolutely none, or must be that his stance is as misleading as can be.⁵⁶ This is less readily apparent for mechanics (after Galileo and Newton) and for the physical sciences in general – once they are firmly established and so long as their practitioners perform within the ambit of Kuhn’s (1962) “normal science.” But a soft social science that bows to Wittgenstein’s dictum negates the very possibility of its ever becoming a science. If would-be social scientists, like the Wittgenstinian philosopher, “may in no way interfere with the actual use of language; [they] can . . . only describe it” (1953: 124), then they are only left to get lost in a Tower of Babel which they, if only by omission, are in fact aggrandizing. Let me insist: if there is one thing that new sciences in the making do incessantly, and more than any other, this is tampering with language. Such “interference” can be for the better, when the end in view is one of creating a specialized and more precise language; or will be for the worse, when no such end is acknowledged and pursued.

However that may be, on the point Wittgenstein holds that meaning and context are inextricably interwoven and, therefore, that to define terms apart from context is to misunderstand how language works. The fallacy is, then, that Wittgenstein is indeed interpreted out of context. Wittgenstein addresses the question, “What is meaning?” We can accept his reply to his query, and yet ask a subsequent and different question: how are meanings actually treated in *scientific usage*, that is, within the specialized vocabularies (languages) that each science constructs for

itself? If this becomes the question, then to quote Wittgenstein amounts to a false witnessing – extending the authority of an author beyond his realm of competence.

The disambiguation-by-context fallacy

This is a shorthand for the dictum (which can be read as an implication of the Wittgenstein fallacy) that “words are disambiguated by context, and *by context only*.” While it is trivially true that the context (sentence or sequel of sentences) helps to disambiguate (even though at times it does not), the error lies in the *only* and, thereby, in missing the crucial point that the more meanings must be surmised by contextual investigation, the less we are dealing with a scientific kind of knowledge. In any science worthy of the name, it is not the context that disambiguates the word (to be sure, the key words); this tricky encumbrance has been disposed of once and for all.

The imprecision fallacy

Popper’s warning is that “precision” may be a “false ideal”; a warning that is being twisted into a praise of imprecise language. The issue addressed by Popper is how non-formalized discourse (natural language) relates to a formalized one. In addressing this issue, Frege (1949) and Russell (among others) took the view that natural language was a hopeless tool which had to be banished and replaced by formal languages. And this is the issue-context within which Popper holds that the precision exemplified by uninterpreted axiomatic systems such as mathematics is a false ideal. This is a view with which I very much concur; but does it have anything to do with recommending *imprecision* for natural languages (i.e., for languages which already are intrinsically imprecise)? Certainly not. Such a recommendation actually amounts to adding imprecision to imprecision; and it is a wholesale distortion to call upon Popper to support a crescendo of terminological and logical sloppiness. The dismal state of natural language imprecision into which the social sciences have allowed themselves to drift surely does not need to be reinforced by an imprecision-pursuing program.

The literary fallacy

In resisting the quest for greater precision or lesser imprecision – this being, let me insist, my sole claim – even social scientists make at times reference to the “poetic” force of poetry and, more generally, of literary language in order to sustain the universal virtues of allusive, evocative, metaphoric, and, all in all, loose language. But why should that be so? As ordinary or maternal language is refined by a spontaneous division of labor strategy into diversified special and specialized languages, it is in fact the case that the literary use (specialization) of language pulls in the direction of an *affect load*, whereas the scientific use (specialization) of language pulls into the opposite direction of *emotive unloading* (Sartori 1979: 12–13). The great poet scores low in the “logic form” of his syntax; the great scientist scores low

in “non-logical” syntax. In short, what is good for the former is bad for the latter – and vice versa. That poetry attains “truth” may be true; but in none of the meanings which “truth” obtains in science. Whoever calls upon literary witnessing (for science) fails to understand the process of specialization of language and confuses, therefore, the two most distant cases of “special usages.”

The arbitrariness fallacy

This compounds all the fallacies inherent in the stipulative theory of language and is expressed by the dictum that all definitions are arbitrary since word meanings are all arbitrary. If “arbitrary” meant “not necessitated by logic,” then the argument would simply be trivial (nobody has ever held, to my knowledge, that there is a logical necessity in calling a cow a “cow”) and much fuss would be made about nothing. But the stipulative theory of language abides by a different understanding of “arbitrary,” for its message is that we are free to make words mean whatever we wish.

The reduction to absurdity of this stance is that since arbitrariness itself must be defined arbitrarily, this being a logical implication true by definition – then the assertion “all meanings are arbitrary” can never be falsified (shown to be in fact false) because each testing can be offset by another arbitrary (free) definition of arbitrariness, and so on *ad infinitum*. On the other hand, if it is true that words have a semantic import and themselves provide *interpretative eyeglasses* (incidentally, a statement fully open to verification), then it is a warrantable assertion that “arbitrariness,” “convention,” and “freedom” are *wrong words* – that is, words which mislead our understanding of a linguistic system. Note that even in a genetic type of explanation the leap from “arbitrariness” conceived as historical hazard (and, thus, received by us as a sedimentation solidified by millennia) to “individual arbitrariness” (freedom of stipulation) is not only an acrobatic inference but also an inference faulted by ambiguity, for the first meaning of arbitrariness is utterly different from the second one. Contrary, then, to the tenets of stipulativism, our thinking and knowing crucially hinge on fishing out from the universe of discourse the *right words*. While I would not go as far as Condillac in saying that science is nothing but a well-made language, I would certainly hold that as we are (semantically) prisoners of the words we pick, we had better pick them well. Sentences such as “no matter what word we chose” are intended to make a point of substance and are appropriate shortcuts across trivial verbal bickerings. Yet, at base, it does matter what word we chose: the “terming” of a concept is a decision of central consequence.

The general point is as follows. One can always say of human artifacts that they are just that: things that have been done (*facere*) and susceptible of being undone – nurture and not nature. This premise in no way permits the inference that therefore all of this is arbitrary. In effect, arbitrariness is the “waste aspect” of the process (i.e., the element which gets lost, which is not built-in in whatever is being built). An arbitrary bridge (free from the law of gravity) is a bridge that falls down. An arbitrary ship sinks. And if language really were arbitrary (in the meaning intended by the stipulativists), this would simply mean that we have no language.

The ultimate implication of the arbitrariness fallacy and of what I call *stipulative arbitrariness*, is that on such premises the universe of discourse can no longer be said to contain analytic statements (i.e., statements whose truth follows from the definition of the words which occur in it).⁵⁷ This implies, in turn, that deductive inferences have no firm ground on which to stand; and deduction – let it be recalled – is the very core of logic.

The premature closure fallacy

Under this heading I bring together arguments which only express a *pro tempore* strategy: namely, the view that while a stabilized vocabulary is necessary for a grown-up science, it is detrimental to a science at its inception. In this connection we hear talk of the “freezing” of language, and the resulting warning is that such a freezing hampers the “dynamics” not only of the language but also of the science. However, statics and dynamics are totally beside the point. A linguistic system is such an overpowering entity that only a welding of Hobbes’s Leviathan with Orwell’s Big Brother might entertain the illusion of freezing it, of a static immobilization. So, nobody holds that natural languages should or can be frozen: language is, whether we like it or not, an ever-changing, quasi-living, dynamic entity. The point at issue is an infinitely narrower one – namely, whether a relatively stabilized “special vocabulary” may, at any stage, hamper the science that it is required to serve. And there is overwhelming evidence, in the history of all the sciences, that this is not the case. That a “fixed language” in no way “blocks the science” is monumentally evident in the instances of Euclidean geometry or, more generally, of the development of mathematics. Likewise, music has long frozen in a highly mechanical fashion its written language (a serial order of semitones), and yet musicians freely and inventively compose; and chemistry was born only when another serial order (of electrons) was firmed up once and for all. With reference to natural languages, the analogy that quickly illustrates the point is the game analogy. Card games or chess are based on a very small number of units and on very firm rules of movement: yet these games allow, precisely on account of the invariance of their “conventions,” an infinite sequel of combinations. If anything, then, it is the relative invariance of its language base that “dynamizes” the cumulative growth of a science.

The legislative fallacy

This is expressed by the dictum that language cannot be legislated upon and that any attempt at disambiguating and standardizing a scientific language amounts to a normative-legislative abuse. Here the fallacy simply resides in calling legislation something that does not bear any resemblance to law-making and law-enforcing. “Legislation” is, in short, a misnomer. Galileo, Newton, or Lavoisier – to cite only three names – proposed winning concepts and conceptions which in due course received the *consensus scholarum* on their intrinsic merits. No scholar “legislates.” Important scholars settle for definitions of theoretical or empirical fertility; and

irrelevant scholars hold on to their irrelevance under various pretexts – of which the anti-legislative banner simply represents the version a la mode. To be sure, any terminological house-cleaning has normative implications (and hopes) in some perfectly respectable sense of the term; but to propose rules is not to enforce rules, is not legislation. And if a critic were to retort, “to me normative means legislative,” I would in turn feel perfectly comfortable with rejecting his stipulation as semantically arbitrary, unfounded, and confusing.

An enumeration of fallacies displays two limitations: on the one hand, it imputes to each one of them more analytic distinctiveness than they may in fact have; on the other hand, it underrates how they are variously combined in a mutually reinforcing vortex of errors. To illustrate the latter point, let me single out a characteristic passage of Feyerabend: “Without a constant misuse of language there cannot be any discovery and any progress” (1970: 25). This is, I submit, a statement that conjoins three fallacies.

In the first place, I would say that “misuse of language” belongs to, and is sustained by, the literary fallacy. From the vantage point of a scientist, it can well be said that the poet “misuses” language. Conversely, the poet is perfectly entitled to retort that science sterilizes and impoverishes language. This having been granted, the fact is that Feyerabend is taking a methodological stand against methodology. On his ground, therefore, he is getting off his own hook with a false witnessing. Turning, in the second place, to the “discovery” element of the statement, Feyerabend equivocates here between context of discovery and context of validation.⁵⁸ On the assumption that there is no “method of discovery” (in some grand sense of the expression), it is easy to state that anything – including misuse – may generate discovery. But this begs the question, which bears – in scientific methodology – on confirmation or validation. As for Feyerabend’s “progress,” the query is, which progress? Ruling out “discovery” – for which there is no rule, not even the one that language is to be misused – we are left with the “cumulative progress” of a normal science. Let me stress that this, and little more, is what methodology can best deliver. If so, it is demonstrably false that a constant misuse of language contributes to the cumulative progress of science. Quite to the contrary, Feyerabend singles out what makes for the destruction of any sustained, collective, and intersubjective progress of scientific knowledge.

Appendix: Rules

Rule 1: Of any empirical concept always, and separately, check (1) whether it is ambiguous, that is, how the meaning relates to the term; and (2) whether it is vague, that is, how the meaning relates to the referent.

Rule 2a: Always check (1) whether the key terms (the designator of the concept and the entailed terms) are defined; (2) whether the meaning declared by their definition is unambiguous; and (3) whether the declared meaning remains, throughout the argument, unchanged (i.e., consistent).

Rule 2b: Always check whether the key terms are used univocally and consistently in the declared meaning.

Rule 3a: Awaiting contrary proof, no word should be used as a synonym for another word.

Rule 3b: With respect to stipulating synonymities, the burden of proof is reversed: what requires demonstration is that by attributing different meanings to different words we create a distinction of no consequence.

Rule 4: In reconstructing a concept, first collect a representative set of definitions; second, extract their characteristics; and third, construct matrixes that organize such characteristics meaningfully.

Rule 5: With respect to the extension of a concept, always assess (1) its degree of boundlessness, and (2) its degree of denotative discrimination vis-à-vis its membership.

Rule 6: The boundlessness of a concept is remedied by increasing the number of its properties; and its discriminating adequacy is improved as additional properties are entered.

Rule 7: The connotation and the denotation of a concept are inversely related.

Rule 8: In selecting the term that designates the concept, always relate to and control with the semantic field to which the term belongs – that is, the set of associated, neighboring words.

Rule 9: If the term that designates the concept unsettles the semantic field (to which the term belongs), then justify your selection by showing that (1) no field meaning is lost, and (2) ambiguity is not increased by being transferred into the rest of the field set.

Rule 10: Make sure that the definiens of a concept is adequate and parsimonious: adequate in that it contains enough characteristics to identify the referents and their boundaries; parsimonious in that no accompanying property is included among the necessary, defining properties.

Glossary

This glossary is cross-disciplinary and settles for a modicum of precision – the more intuitively intelligible formulation is preferred to the more technical one. The following symbols are used:

ST Synonymous term, surrogate term, or near-synonym

OT Opposite term (antonym)

TM Technical meaning

* Stipulation

- Accompanying property** Any property that is not treated as a defining property. ST: contingent property, accidental property, variable property.
- Accuracy (of a measure)** A measure that is free of systematic (as opposed to random) error.
- Adequacy** Short form for "extensional adequacy." A concept (or its definition) is adequate when it obtains the denotative power that is necessary and sufficient for the enquiry at hand.* OT: undenotativeness.
- Aggregate** Any set which is not a system.
- Ambiguity** Having several meanings which can be mistaken for each other, thus producing fallacious argumentation. Ambiguity is a defect that pertains to the meaning-to-word linkage and results from *homonyms* and *synonyms*. OT: clarity, univocity. ST: equivocity.
- Analytic statement** A statement whose denial involves self-contradiction. More broadly, a statement true by definition. Specifically, analytic statements are true by virtue of their logical form alone, or by virtue of both their logical form and the meaning of their constituent terms (e.g., "all bachelors are unmarried"). OT: synthetic statement.
- Antonymy** Oppositeness of meaning. Words that are opposite (opposites) are antonyms. Opposites or antonyms are the basis of definitions *a contrario* in which each term of a pair is reciprocally defined by its contrary or contradictory.
- Applied science** The performing part of a scientific knowledge. Derivatively, the applied science also contributes to the testing of the hypotheses of the "pure science." See: Scientific theory.
- Approach** A theoretically sustained vantage point for analyzing a subject matter. An approach is more encompassing (but generally less precise) than a conceptual framework: it determines the sets of concepts, questions, and perspectives of an inquiry. An approach may also be seen as a quasi-theory or as a pretheory, a path to theory.
- Arbitrariness (in stipulation)** See: Stipulative arbitrariness.
- Arbitrary synonymity** A synonymy unsupported by *interpretative sentences*, that is, established by mere stipulative *fiat*.* ST: unfounded synonymy.
- Artificial language** TM: any language whose vocabulary and syntax are determinately specified. Often an artificial language is an "uninterpreted" language. See: Formalization, Calculus. In ordinary parlance, Esperanto would be an artificial language. OT: natural language.
- Associated terms** Terms that belong to (cluster within) a same *semantic field*. ST: neighboring terms. Not to be confused with entailed terms.
- Attribute** Whatever may be predicated of an entity.
- Axiom** Statement assumed to be true (asserted without proof) in order to prove other statements (theorems). Vulgarly: unproven assumption.
- Boundlessness (of a concept)** Not having boundaries for establishing what is included in or excluded from its extension.
- Calculus** An uninterpreted axiomatic system or, more broadly, a constructed logical system. A calculus is expressed in formalized language. See: Formalization.

- The major types of logical calculi are (1) propositional, or sentential; and (2) functional, or predicate.
- Categorical statement** A simple proposition having a subject, verb, predicate form. ST: subject-predicate statement.
- Characteristic** Can be used interchangeably with *property*. TM: characteristics are properties included in the definition of a concept.
- Checklist** A mere enumeration of items that abides by no logical criterion.
- Classification** An ordering whose objects are assigned to mutually exclusive and jointly exhaustive classes. At each step of a classificatory analysis (division) its objects are treated dichotomously: they *either* fall or do not fall into a given class. A classification thus requires a single criterion called *fundamentum divisionis*, the basis of division. When multiple criteria or dimensions are involved, we have a typology and/or a taxonomy. See: Hierarchical classification.
- Cognitive meaning** A non-emotive meaning of heuristic value.
- Concept** The basic unit of thinking. It can be said that we have a concept of A (or of A-ness) when we are able to distinguish A from whatever is not-A.
- Concept construction** The forming, or formulating, of a concept.
- Concept reconstruction** The sorting out of the meanings of a concept. More precisely, an explication that consists of extracting (and ordering) the *characteristics* from the definitions of a term.
- Conception** A concept, (1) in the early process of being conceived, or (2) all the compatible meanings associated with a word. A conception is thus a loose or unstructured concept.
- Conceptual framework** A scheme of defined and differentiated concepts used for (and confined to) the study of a particular subject. See: Approach.
- Condition** See: Necessary condition, Sufficient condition. A condition is not a cause, even though "condition analysis" prefaces causal analysis.
- Conditional statement** A compound proposition that takes the form, "If A, then B." ST: hypothetical statement.
- Connective** Any sentence-forming operator. The most common sentential (or propositional) connectives are negation, conjunction, disjunction, implication (not, and, or, if/then); but also: as, but, because, and the like. Connectives only function syntactically; they do not have extralinguistic referents, but rather intralinguistic uses.
- Concreta** Objects susceptible to direct observation. OT: ideata.
- Confusion** A defect resulting from ambiguity.
- Connotation** See: Intension.
- Context** Any setting in which a word is used, to be specified as follows: (1) author's context, (2) disciplinary context, (3) field or subfield context, (4) theoretical context.
- Context of discovery** The context that precedes the context of validation and is not subject, therefore, to the strictures of the latter. Popper's "conjectures" largely belong to the context of discovery.

- Context of validation** The context within which normal science performs. Logic, methodology, and statistical techniques largely apply to the context of validation or of verification, not to the context of discovery. Popper's "refutations" belong to the context of validation.
- Contingent** Logically possible, or what is not logically necessary.
- Contradiction** The joint assertion of a proposition and its denial. The *law of noncontradiction* is that nothing can both be P and not-P.
- Contradictory** Two terms are contradictory if they are mutually exclusive and exhaustive (e.g., the contradictory of blue is not-blue). When two propositions are contradictory, if one is true the other is false, and if one is false the other is true. The principle of the *excluded middle* (see: Excluded middle) applies to contradictories, not to contraries.
- Contrary** Two terms are contrary if they are mutually exclusive but not exhaustively so. With respect to contrary propositions, if one is true the other is false, but if one is false the truth-value of the other is indeterminate. ST: opposite, contrasting term.
- Cutting-off indeterminacy** A defect of the extension that leaves undecided the inclusion-exclusion of marginal entities.
- Declarative definition** A definition that simply declares the meaning that is intended. ST: declaratory definition.
- Definiendum** What is to be defined.
- Definiens** Whatever serves to define. TM: expression giving the *characteristics* of a concept that follows the symbol of definitional equality.
- Defining characteristic** A characteristic or property in the absence of which a word is not applicable: we are unable to decide to what it applies.
- Defining properties** The necessary characteristics of a concept (in its definition).
- Definition** In natural language, any conveyance of meaning expressed as an equivalence between a *definiendum* and a *definiens*. Ostensive and operational definitions convey meaning, but are not definitions in the sense defined above. Definitions *a contrario* also require a definition of their own. In a formalized or uninterpreted language, definitions do not convey meaning: they determine the notational system. See also: Declarative definition, Denotative definition, Precising definition, *Per genus et differentiam*.
- Definition a contrario** A binary definition expressed in the form; "x is the opposite or the contradictory of y." Definitions by contrary or by contradictory are negative: they assert what something *is not*.
- Denotata (of a term)** The objects that can be classed under a term.
- Denotation** See: Extension. The denotation of a word is the ensemble of things (objects) to which the word applies.
- Denotative discrimination** The extensional property that enables us to sort out the membership of a referent. ST: discriminative adequacy, discriminating power.
- Denotative definition** Any extensional definition. Vulgarly: definitions intended to "seize the object."

- Dimension** TM: A characteristic that takes on more than two values (i.e., treated as a variable). Basically, a dimension is unidimensional when its values range across binary outermost opposites. A multidimensional dimension is ill-suited for measurement.
- Discriminative adequacy** See: Denotative discrimination.
- Disjunctive statement** A compound proposition that takes the form, "A or B."
- Dispositional definition** Extensional definitions in which some test is specified as a means of identifying denotata. They apply to dispositional words – such as irritable, soluble, combustible, elastic, habit – which ascribe a tendency or pre-disposition.
- Empirical concept** Any concept that is amenable, no matter how indirectly, to observations. Thus empirical concepts involve observational terms and *referents*. Contrasted with theoretical terms, logical concepts (e.g., "analytic") and metaphysical concepts (e.g., "absolute being").
- Entailed term** A term that belongs to the *defining characteristics* of the concept being defined. Not to be confused with associated term.
- Entity** General name for whatever is. ST: object. Entities are not "things," for the latter are usually conceived, more restrictively, as material substances.
- Entry term** A term used as the heading (or lemma) in a concept definition.
- Equality** A relation between terms or sets which is either of *identity* or, more loosely, of *equivalence*. ST: sameness, similarity.
- Equivocation** Fallacy resulting from *ambiguity*.
- Etymology** The investigation of earlier or original meanings of words. The etymology of "etymology" conveys that what is discovered is the true meaning.
- Evaluative connotation** Class of connotations characterized by positive or negative value-loading. Also called "emotive meaning." OT: cognitive meaning.
- Explication** Carnap's renaming of logical analysis or rational reconstruction. An explication sentence (or an explicative definition) does not simply exhibit the commonly accepted meaning of an expression (concept) but proposes a new and precise meaning for it. Explication aims at reducing the limitations, ambiguities, and inconsistencies of the ordinary usage of terms by propounding a reinterpretation intended to enhance the clarity and precision of their meanings as well as their ability to function in hypotheses and theories with explanatory and predictive force (Hempel). An explicative sentence can thus be contrasted with an *interpretative sentence*.
- Extension** The referent or referents to which a term applies. ST: denotation.
- Falsifiability** Possibility of being disproved. See: Verification.
- Falsification** While a generalization cannot be finally established by any number of supporting instances, it is falsified by counter-instances (e.g., "All swans are white," is falsified by finding one black swan). See: Verification.
- Formalization** Making the logical structure of a language explicit by replacing descriptive terms with variables (x, y, z). Formalization also involves formation rules and transformation rules. A formalized language is a language (in a metaphorical sense of the term) whose logical structure is explicitly and completely formulated. See: Calculus.

- Fuzziness** A defect resulting from undenotativeness.*
- Glossary** A dictionary of the terms used in a specified context. Glossaries apply to a specialized language (see: Specialized language).
- Heuristic value** A property that applies to the context of discovery rather than to the context of validation. Thus, a heuristic value is not a truth-value (e.g., Weber's ideal types are said to have heuristic value).
- Hierarchical classification** A classification (see) whose classes are either successive divisions of a *summum genus* (the all-inclusive kind) or, conversely, successive aggregations from an *infima species* (the lowest, indivisible class). The in-between classes are called *subalterna genera*. Hierarchical or vertical classifications assume transitivity and employ the mode of analysis (and definition) called *per genus proximum et differentiam specificam*. Vulgarly: an ordering in which a genus (the all-inclusive class) is divided into species and subspecies.
- Homonymy** A same word for different meanings. In dictionaries *homonims* have separate entries while *polysemes* are treated under a single entry.
- Ideal type** Heuristic construct that does not reflect frequency or probability of empirical occurrence. When construed as a polar end of a continuum or of a serial order, it coincides with a *polar concept*. When construed as a parameter or model (archetype) an ideal type is also called "pure type."
- Indefiniteness** See: Undenotativeness. Etymologically: diffuseness of boundaries.
- Indicator** A variable that stands for another factor in order to facilitate its measurement (TM). Indicators help operationalization.
- Intension** The ensemble of characteristics of (included in) a concept. Vulgarly: the associations a word has in the mind of its users. ST: connotation. The intension may be extensionally opaque.
- Interpretative sentence** A sentence that relates a *definiendum* to the rules of language, thus establishing a "correct meaning." Not to be confused with explicative sentences (see: Explication).
- Interpreted language** The same as "natural language" or, more precisely, any meaning-based language. OT: uninterpreted language.
- Key term** The designator of a concept.* But see: Entailed term.
- Language** See Interpreted language, Artificial language, Formalization. While formalized languages (i.e., constructed logical systems) are frequently referred to as languages, it is more precise to call them calculi (see: Calculus).
- Lexical definition** A definition reported in dictionaries. Thus a lexical definition employs a meaning that a word already has. OT: stipulation, stipulative definition.
- Lexical field** A set of words in their ordinary usages as studied by linguists. Not to be confused with *semantic field* as defined here: the emphasis of lexical field analysis is not on the thought-molding weight of words.
- Lexical primitive** See: Primitive.
- Loaded word** A word with strong evaluative connotation, whether positive or negative. OT: neutral word.

- Logic** The study of the validity of inferences (see: Validity). Thus logic deals with the relationship between premises and conclusion, not with the truth of the premises. Vulgarly: logic applies to the form, not to the substance of arguments.
- Logical words** Logical constants, namely, the symbols employed in valid deductive argument. Logical words include connectives, quantifiers, and all the notational forms used for logical operations.
- Marginal entity indefiniteness** A denotative inadequacy bearing on the cut-off points.*
- Meaning** What is predicated or conveyed by a word or term. Vulgarly: any mental content.
- Measure** A unit in terms of which quantitative differences applicable to entities or properties can be compared and assigned numerical values.
- Measurement** Vulgarly: establishing quantities of something.
- Membership** The relation between a set and its elements. Do not confuse the relation of set-membership with the relation of set-inclusion.
- Membership indefiniteness** A defect resulting from insufficient denotative discrimination.*
- Metaphor** A "transferred" meaning.
- Minimal definition** A definition that includes the defining properties (or characteristics) and excludes the accompanying properties. See: Parsimony.
- Model** (1) a drastically simplified representation of the real world endowed with strong explanatory power; or (2) an exemplary, paradigmatic, idealized case. Neither are technical meanings.
- Necessary characteristic** See: Defining characteristic (ST).
- Necessary condition** In causal explanation a condition in the absence of which an event (effect) cannot occur. A necessary condition is not sufficient for an event to occur or for a thing to exist (see: Sufficient condition).
- Neighboring terms** See: Associated terms.
- Neologism** A new word for a new meaning.* Vulgarly: any new word.
- Normative statement** Statements that are neither factual nor hypothetical. Normative statements can be (1) instrumental, when they establish means-to-end relationships thus expressing a *Zweckrationalität*; or (2) evaluative (*Wertrationalität*). Therefore "normativism" is not the same as "value normativism" (as expressed by value statements). For the latter, see: Evaluative connotation. Normative statements should not be confused with laws. ST: prescriptive statement.
- Object concept** A concept treated as an object, that is, employed for identifying a discrete object.* Object concepts belong to the logic of *classification*. Not to be confused with empirical concept. OT: property concept.
- Object words** That class of words that actually denotes material objects (B. Russell). Object words are learned ostensively (see: Ostensive definition). The class of object words is narrower than the class of observable terms.
- Objective validity** Intersubjective truth-value resulting from two conditions: (1) verifiability by any researcher (observer); (2) having in fact been

- confirmed (or not disconfirmed) by other observers. Objective validity does not apply to analytic truths or statements.
- Open texture** An extensional indefiniteness. Open texture is looser than cut-off indeterminacy.
- Operational definition** An extensional definition hinged on measurable properties and leading to measurement operations. More broadly, a definition that establishes the meaning of the definiendum in terms of observable-measurable indicators. Operational definitions involve validity.
- Operator** A symbol with no independent meaning. *Existential quantifiers* (to be read: "there exists") and *universal quantifiers* (to be read: "for all") used in combination with a variable are common examples of operators. See: Quantifiers.
- Opposites** Pairs of words with contrary or contrasting meanings. An opposite word is an antonym (see: Antonymy). Some opposites are gradable (e.g., wide–narrow, big–small); other opposites are not, for they are members of two-term sets (e.g., alive–dead, married–single). In the latter case to say, for example, that somebody is not alive, married, and so on, is to say that he or she is dead, single, and so forth. In the former case, to say, for example, that something is not big does not necessarily entail that it is small: it may be neither big nor small.
- Ordinary language** The natural language in current use. Lexical considerations generally refer to ordinary language. OT: specialized language. See also: Artificial language.
- Ostension** The designation of objects by non-verbal means, such as pointing.
- Ostensive definition** A definition based on pointing to existents.
- Paradigm** In Kuhn's sense, the scientific community's consensus on what constitutes the scientific procedure, and the basic axioms or findings thus resulting. More loosely, a framework that gives organization and direction to scientific investigation. The Platonic sense, which is entirely different, may be rendered by "prototype."
- Paradox** TM: a statement whose truth leads to a contradiction, and the truth of whose denial leads to a contradiction (e.g., the paradox of the liar: "this statement is false").
- Parsimony (in defining)** A definition that includes only the necessary properties of a concept. See: Minimal definition.
- Per genus et differentiam** Aristotle's standard procedure of definition: giving what is common (the *genus*, the kind) and what makes for the difference (*differentia*). For example, in the statement "man is a rational animal," the genus is "animal" and the difference (the specificity) is "rational." See: Hierarchical classification.
- Polar concept** An empirical concept construed as a polar extreme on a continuum. See: Ideal type.
- Polyseme** Word with many meanings. Most natural language words are polysemes, or polysemic.
- Precising definition** A subclass of denotative definitions that specifically addresses the problem of membership indefiniteness, or of membership fuzziness.*

- Predicate** Term designating a property. Predication: attribution of a property to something.
- Primitive** Any undefined term. Reference is generally made to (1) the undefined word that exhausts a line of regression, or (2) a look-and-see word, or (3) a lexical primitive (i.e., one of the standard, established dictionary definitions of a word).
- Property** See: Characteristic. TM: a property is either (1) an attribute of the referent, or (2) a second-order metaconcept for what can be said about a concept.
- Property concept** A concept treated as a variable possessing more than two ordered values.* OT: object concept (e.g., democratic is a property concept, while democracy is an object concept). Property concepts belong to the logic of *gradation*.
- Proposition** What a sentence asserts or states. See: Statement. Truth is a property of propositions, not of sentences. Sentences are only meaningless or meaningful (and need not be assertive, i.e., propositions). Different sentences may assert a same proposition. Propositions can be (1) simple (or atomic), or (2) compound (or molecular) depending on whether they do not or do have other propositions as component parts. Among simple propositions, the more important types are the categorical (see: Categorical statement) and the relational (affirming or denying that a relation holds). Instances of compound propositions are the disjunctive and the conditional propositions (see: Disjunctive, Conditional propositions).
- Pure science** See: Scientific theory.
- Quantifiers** In natural language, the forms "all" (every), "many," "some" (few), and "none."
- Recognitor** A discriminable feature of the object world used as symptomatic of some object or class of objects. See: Operational definition. ST: indicator.
- Reductio ad absurdum** The reduction to absurdity as a method of indirect proof argues that the denial of A (together with accepted propositions B1, B2 . . .) leads to contradiction. The force of the argument resides in using premises that are far better established than the denial of A. The reduction to absurdity is equally a method of indirect disconfirmation.
- Referent** The real world counterpart of words (i.e., the objects, entities or processes denoted by words). Short form for "extralinguistic referent." Referents pertain to the extension of a concept.
- Reliability** The extent to which measurements yield, when repeated, similar or confirming results.
- Requisite characteristic** See: Defining characteristic. ST: necessary characteristic.
- Root word** An indivisible form which can be written by itself or in various combinations to create derivatives. Usually the "etymon."
- Sameness** See: Equality.
- Scientific theory** A theory is scientific when it provides the following: (1) specified concepts, (2) a set of general assumptions, (3) a connection between its theoretical statement and observable phenomena – that is, "testability in

principle" (Hempel) or "falsifiability" (Popper). The scientific theory of a science is often called the "pure science," as contrasted to the applied science.

Semantic field A covarying ensemble of associated and neighboring terms that constitute a *system of terms*. A linguistic system as a whole best displays the systemic property of covariance at its subsystem level (i.e., when subdivided into semantic field units). A semantic field analysis may coincide in extension, but not in intension, with a lexical field analysis: for it is the former, not the latter, that brings out the semantic import (see below).

Semantic import The interpretative weight of words. See: Semantic projection.

Semantic projection That words condition the conceiving and perceiving of things. More technically, the interpretative bearing of the connotation on the denotation.

Semantics The study of language in its meaning function. In Carnap and Tarski, a logical theory of meaning (TM not followed here). Quine breaks down semantics into a theory of reference (bearing on the denotation) and a theory of meaning (bearing on the connotation). This distinction obfuscates the notion of semantic projection. From the latter vantage point, semantics accounts for the *thought-molding* and *thought-slicing* impact of a given linguistic system.

Set A cluster of items with shared attributes that does not presuppose ordering or sequencing. A set is "fuzzy" if its membership is not clear. A "nul set" is a set with no members. Not to be confused with "string," nor with "class."

Setting The context, environment, and/or language within which concepts are created and used. See: Context.

Sign Anything that suggests the existence of something else. If sign is distinguished from "signal," then it is the same as "symbol."

Specialized language Any language that refines ordinary use with respect to a specific area of inquiry or interest. A specialized or *special language* is still a natural language, characterized, however, by a technical terminology. Not to be confused with artificial language.

Statement Either what is asserted by a proposition, or a sentence that expresses a proposition. Statement and proposition are often used interchangeably (see: Proposition).

Stem word Root word (ST).

Stipulation A definition not found in dictionaries (i.e., not a reportive or lexical definition) proposed for future observance. OT: lexical definition. If the mere selection of one of the lexical meanings is called a stipulation, then almost every definition is stipulative.

Stipulative arbitrariness A stipulative definition not sustained by *interpretative sentences* and/or proposed without consideration of the semantic field; that is, a definition that unsettles, without resettling, the semantic field to which a term belongs.*

String A sequence of items. ST: chain. Not to be confused with set.

Substitution test Substituting a neighboring word (to the one employed by the author of the sentence under inspection) in order to assess whether the

substituted word improves the clarity and sharpens the meaning intended by the author.

Sufficient condition In causal explanation, that condition which suffices to bring a thing into existence or to generate an event (effect). Note that different sufficient conditions can lead to the event (i.e., a given sufficient condition is neither exclusive nor exhaustive) (e.g., lack of oxygen is a sufficient condition of death; but death can occur on account of many other conditions).

Surrogate term A term that can be used interchangeably with another (regardless of whether it is a synonym or a near-synonym) in order to avoid pedantic repetition.*

Symmetry A relation is symmetric when it takes the form "if a = b, then b = a." Conversely, a relation can either be asymmetric (e.g., causality), or non-symmetric.

Synonymy A same meaning of (or stipulated for) different words. Synonymy assumes similarity (not identity) of meaning.

Syntactics Study of linguistic signs in relation to each other, without consideration of their meanings. Formalized languages are syntactic.

System Any bounded set whose elements are interdependent with each other.

Tautology Literally, saying the same thing. A tautology is not a logical fallacy and should not be confused with the fallacy of *petitio principii* or circular reasoning.

Term The form used to signify the concept – that is, a word allocated to a concept.* Etymologically, the terminal element (*terminus*) of analysis.

Terminological analysis TM: explication of the meanings of words leading to the selection of appropriate terms for concepts.*

Theoretical term A term made meaningful by (and giving meaning to) the theory to which it belongs (i.e., characterized by a theoretical function). Theoretical terms are often contrasted with "observables," or observational terms. It can also be said that theoretical terms have an intensional, not an extensional, meaning. Examples: system, structure, function, equilibrium, homeostasis.

Theory A body of systematically related generalizations of explanatory value.

To denote To identify the denotata of a concept.

To term To select the term(s) for a concept.*

Truth A property of single statements or propositions (while validity is a property of inferences and arguments).

Unboundedness Lack or insufficiency of boundaries. ST: boundlessness. See: Undenotativeness.

Undenotativeness Defect that pertains to the meaning-to-referent linkage. Specifically, undenotativeness can be of two sorts: (1) unboundedness, or (2) discriminative inadequacy.*

Uninterpreted language A language in which meanings are unassigned. Formalized languages are uninterpreted. See: Formalization, Calculus.

Univocal Unambiguous. A univocal word is a word with only one meaning.

Vagueness In ordinary parlance, any kind of looseness and indeterminacy. TM:

extensional indefiniteness: a word is vague if there are objects (referents) which are neither includable in, nor excludable from, its extension. ST: undenotativeness.

Validation The process by which scientific theories become accepted. ST: confirmation.

Validity In logic an argument is valid when its conclusion correctly follows (inferentially) from its premise. A measurement is valid (empirically) if it measures what it purports to measure.

Value(s) With reference to a variable (see: Variable), the elements over which it ranges. Not to be confused with value connotations and the ethical meaning of the term.

Variable TM: anything that may take on more than two values, or successive values. However, "sex" is generally called a variable even though it may take only one of two values.

Verification Testing the empirical validity of assertions, generalizations, laws, and theories. Since the number of supporting instances is indefinite, a process of verification is never final. In practice, therefore, verification is upheld by non-falsification (Popper). See: Falsification.

Word Any form used in a natural language to convey meaning.

Notes

* Originally published as Giovanni Sartori (1984) "Guidelines for Concept Analysis," in G. Sartori (ed.), *Social Science Concepts: A Systematic Analysis*, Beverly Hills, CA: Sage, Chapter 1.

- 1 This remains the point no matter how much we stress that "meaning is generally attached not to words in isolation, but to expressions" (Oppenheim 1981: 4). Even so, an expression is meaningless – it can neither be formulated nor understood – unless we know what its words mean in isolation. That meaning is generally "attached to expressions" cannot be construed as an objection to my argument.
- 2 Even so the sentence context does not suffice, as such, to establish a precise (unequivocal or unambiguous) meaning. For this we need ad hoc sentences, that is, defining sentences. Thus, sentences in general "specify" meanings in the sense that they narrow the total meaning range; they do not specify in the sense of providing a single, well-defined meaning.
- 3 To call any word – except proper names and syntactic terms – a concept is simply to say that any word involves some degree of abstraction. Yet is "pear" (admittedly, an abstraction) in any way assimilable, for example, to "consensus"? In order not to drown into a Hegelian night, I say the "idea" of pear and the "concept" of consensus.
- 4 See, for example, Max Black, "Some Troubles with Whorfianism" (1969: 30–35). Black's attack carries to the extremes and exemplifies the a priori rejection of semantics as a disturbance. For a fair discussion, see, in Harry Hoijer (1954), the chapters of Fearing, Hoijer, and Hockett. In conjunction with Whorf, see also Sapir (1921, 1949).
- 5 For the color example, see Palmer (1981: 70–75). The example of the Eskimos and Aztecs is drawn from Whorf (1956: 216). For the Brazilian counting system, see again Palmer (1981: 70).
- 6 That translators somehow manage to translate, if imperfectly and at times awkwardly, has no bearing on the point at issue. The polyglot "rethinks" in each of the languages he masters. The monoglot, however, is truly closed into the semantic properties of his language.

- 7 In common parlance, vagueness is any unclarity or indeterminacy; and even in its technical meaning it is far from established that "vagueness" applies *only* to the referential problem. Kaplan (1964: 65–68) speaks of "internal vagueness." Similarly, Copi (1972: 110–11) uses "vagueness" ambiguously – namely (1) simply to say "clarification of the meaning of a term," and (2) specifically for "borderline cases." But the prevalent usage, followed here, is to restrict vagueness to "extensional vagueness." (See, e.g., Quine 1960: 125–29).
- 8 Adequacy is the term used for their triangle by Ogden and Richards (1946). "Undenotative" is my coinage that I propose in order to avoid the ambiguity associated with the ordinary meaning of "vagueness."
- 9 The distinction between connotation and denotation was introduced by John Stuart Mill; the one between intension and extension derives from Frege (whose distinction applied only to proper names and actually was between *Sinn* and *Bedeutung*, often translated as "sense" and "reference") but was generalized by Carnap (1956). For the complexities that are involved, see Lyons (1977: vol. 1, Chapter 7). The intension–extension mode of analysis is currently attacked by the "new theory of reference." (See Schwartz [1977], which brings together contributions of Putnam, Quine, Saul, Kripke, et al.) This new theory basically deals with proper names and "natural kind" terms (i.e., with classes of terms that are largely irrelevant to the social sciences).
- 10 It will be noted that I do not define the intension in terms of the extension, as most authors do. For example, "The intension of a word consists of the properties a thing must have in order to be in the *extension* of the word" (Salmon 1964: 91, my emphasis). Similarly, "A word connotes each and every characteristic anything must possess to be correctly *denoted* by that word" (Michalos 1969: 388, my emphasis). The two definitions are standard ones, but I find them excessively circular.
- 11 To exemplify, in this view the denotation of "cow" consists of the individual animals so designated. It may also be said that the denotation of "rodent" is to look at mice, squirrels, rabbits, beavers, porcupines, and so on. All is well so long as reference is made (as is invariably the case) to "things" – names for material objects, natural kinds, and the like – amenable to sense perception, in short, to things that can be identified ostensively. The problem arises when we pass from object-words to what Bertrand Russell called "dictionary words," that is, to all the rest and the most.
- 12 This definition remains in the second revised edition of 1973, p. 123.
- 13 Therefore I do not concede that what can be identified ostensively (see the notion of ostensive definition in this glossary) is entirely extralinguistic. As argued in "The semantic import," even sense experience is largely molded – in terms of slicing, when not of semantic projection – by the linguistic system.
- 14 When an argument is stated in syllogistic form, the taking of a same word in two different meanings enters the list of fallacies under the name of "paralogism."
- 15 This formulation assumes (with Hempel 1965: 173 ff) that "theoretical terms" whose meaning is established by their function in a theoretical argument are in no way reducible to observational terms. If one assumes, instead, that all concepts can be turned, at least in principle, into empirical (observational) concepts, then "if empirical" is redundant. On the debate concerning the "theoretical–observational" distinction, see Shapere in Achinstein and Barker (1969: 115–31).
- 16 See John Stuart Mill: "The simplest and most correct notion of a definition is a proposition declaratory of the meaning of a word: namely, either the meaning which it bears in common acceptance, or that which the speaker or writer . . . intends to annex to it" (1898: Book 1, Chapter 8: 86).
- 17 Similarly, so-called "nominal scales" are not scales at all. Yet, when the item is "scales" authors always begin with nominal scales.
- 18 Note that "denotative definition," as defined, does not correspond to what is commonly understood by "definition by denotation." The difference follows from our assessment of how the denotation relates to the connotation.

- 19 I draw the "precising definition" from Copi (1972: 139–40). However, in Copi, a precising definition is a definition that helps decide borderline cases, and actually corresponds to what I call "denotative definition." Since we lack a label for the specific problem of membership indefiniteness, I narrow Copi's meaning to this more specific purpose.
- 20 I drop at this point the issues of membership fuzziness and of the cut-off point, for they will be taken up in "Undenotativeness (vagueness)."
- 21 The objection might still be that a symbolic capability is not an observable characteristic. It can be detected, however, by means of indicators. The example must also be subjected to the caveat that any denotative defining must be prefaced by "initial conditions."
- 22 This is not as restrictive as to imply (as did P. W. Bridgman's original formulation in *The Logic of Modern Physics*, 1927) that an operational definition must specify a testing "operation" (such as the scratch test for defining "harder than"). On the other hand, "operationalism" certainly calls for something more, and more precise, than sheer observability.
- 23 Many of my omissions are, however, deliberate. For example, what do we gain, as long as we deal with natural languages, by calling a definition "semantic"? This is, at best, a redundancy that impoverishes, in turn, the meaningfulness of "semantics." Also, and furthermore, what is the point in opposing "real" to "verbal" definitions? Is "definition by context" anything else than recommending to infer from a context a definition that is not explicitly given? The standard treatment of definitions in textbooks appears obsolete and needs rethinking.
- 24 To be sure, we may also have to account for interdisciplinary ambiguities. For example, concepts that lack disciplinary distinctiveness (e.g., structure, culture, alienation) may well have to be reconstructed across disciplines.
- 25 Let it be added that languages that draw from many sources do have "true synonyms." English disposes of "kingly" (Anglo-Saxon), "royal" (French), and "regal" (Latin), that do mean the same thing. For the same reason, in English "freedom" and "liberty" are synonyms.
- 26 This is not to detract from the further point, forcefully made by Goodman in "Seven Strictures on Similarity" (1970), that "similarity" is hard to define with any precision.
- 27 The "sentence game" often loses sight of this difference, thus ending up with dismembering the concept (and my complaint bears on the "game" excesses of the exercise). One can write a 450-page analysis of synonymy (as Arne Naess) in which the conceptual point never comes up, and is indeed drowned in an ocean of synonymy sentences.
- 28 See Naess (1953: 9, 41, and *passim*). Interpretative sentences are generally contrasted to "explicative sentences" that improve upon the definiendum by refining or supplementing its meaning.
- 29 My objections to stipulativism are given at the end, in "The fallacy of arbitrariness." Russell (1921: 190) nicely ridicules the stipulativist-conventionalist explanation of language: "We can hardly suppose a parliament of hitherto speechless elders meeting together and agreeing to call a cow a cow and a wolf a wolf."
- 30 This is a feeble meaning of "explanation." Most logicians require the *explanans* to be a covering law under which the *explanandum* can be subsumed.
- 31 I first proposed this rule, with reference to the analysis of the concept of ideology, in Sartori (1969: especially 399).
- 32 "Representative" is not intended technically. In connection with this rule, the objection could be that previously advanced explicit definitions of a concept might not be the best material for a systematic explication of its meaning(s). This suggests a reformulation of Rule 4 in terms of *usage* (in accord with the tenets of ordinary language philosophers), as follows: "In reconstructing a concept, first collect a sample of *usage*." Quite aside from my qualms about ordinary language, for the time being following two routes would be confusing; but this is not to affirm in principle that ordinary usage should be discounted.
- 33 A good illustration of what happens when no such organizational design is pursued is Kluckhohn and Kroeber (1952) which leaves us – with respect to the concept of culture – with a wealth of undigestible material.
- 34 Among the other conditions that must be equal, the obvious one is that the characteristics in question should not be ambiguous. Adding one ambiguous characteristic to another worsens, if anything, boundary indefiniteness.
- 35 See Zannoni (1978: 1–30). This article well illustrates the method of analysis proposed by the present "Guidelines."
- 36 The limit (i.e., too many properties) is that we should not obtain empirically empty sets.
- 37 For "open texture," see Harrison (1972: 128–52). See also Waisman (1952).
- 38 The classic illustration of this mode of analysis is provided by the so-called Tree of Porphyry. See, for example, Cohen and Nagel (1936: 236).
- 39 The suggestion was initially outlined in Sartori (1970). But now see Sartori et al. (1975: 17–19, see Chapter 3 of this volume) where a step-by-step illustration is provided by the concept of family.
- 40 It should be understood that this is so because we are now considering a vertical ordering. See Cohen and Nagel (1936: 33): "When a series of terms is arranged in order of subordination, the extension and intension vary inversely." I say "inversely related," which is a more flexible formulation because Cohen and Nagel themselves immediately issue the caveat that the "law of inverse variation" must not be understood strictly.
- 41 It is apparent that I am not interested in the ontological or epistemological status of universals. By "universal" I simply intend the upper limit of an abstractive treatment. For the current relevance of the Medieval dispute, see, for example, Quine (1963: 14 ff). Popper discusses more than most contemporary authors the notion of universal (especially 1959).
- 42 As Popper puts it (1962: 262), "Every scientific language must make use of *genuine universals*, i.e., of words . . . with an indeterminate extension, though perhaps with a reasonably definite intensional 'meaning.'" In my argument, the extension is maximal but not necessarily indeterminate.
- 43 "Reconstruction" is intended broadly as the complement of "construction," and therefore not in the specific meaning proposed by Oppenheim (1981: 1), for whom to reconstruct concepts is to "provide them with explicative definitions." I do concur, however, with Oppenheim's emphasis on explication.
- 44 These are the configurations that Wittgenstein addresses with his image of the artichoke and its leaves. When the leaves are peeled off, there remains a common core.
- 45 For example, descriptive versus evaluative or normative versus non-normative. It is important to underline, in this connection, that a normative statement need not be an evaluative statement. As Max Weber pointed out, a *Zweckrationalität* (rationality of ends) is very different from a *Wertrationalität* (value-rationality) in that the former addresses means-to-ends relationships that can be expressed in the conditional "if-then" form.
- 46 Feyerabend (1962, *passim*) contends that the meaning of a term is solely a function of the "theory" containing the term. (See the rebuttal of Putnam [1975: Chapter 6]). My scheme (Figures 4.9 and 4.10) suggests how such a contention might be tested. Of course, much depends on which theory is deemed "theory." Feyerabend's reasoning can well leave us with ideologically untouchable sanctuaries.
- 47 I have given in *The Tower of Babel* (Chapter 3 of this volume) four reasons for this progressive deterioration: the loss of etymological anchorage, the loss of historical anchorage, the loss of the mainstream of discourse, and the "frenzy of novitism."
- 48 This is the case in principle. In practice, because our semantic fields are all in disarray, it may well happen that by redefining one term the associated ones regain an ordered placement.
- 49 It can be read, however, as a rule that blocks "stipulative arbitrariness" and thus as an implementation of Rule 3. In this connection, my semantic field rules are illustrative of what is required from "interpretative sentences."

- 50 As the text implies, my notion of "substitution test" is drawn from Riggs (1975) and is to be credited to him.
- 51 The distinction between pure and applied science is a standard one in the natural sciences. More specifically, it can be said that "science" includes a "scientific theory" that consists, according to Hempel, of three elements: (1) specified concepts; (2) a set of general assumptions; and (3) a connection between theoretical statements and empirical phenomena, namely, "testability in principle." See Hempel (1965: 150). The "applied science" is not, then, the sheer activity of practical problem solving.
- 52 Note, however, that specification of necessary characteristics for a term's applicability does not determine its "full meaning" (its intension). For example, "animal is any warm-blooded organism" may be a minimal definition of "animal" (as defined), but certainly does not exhaust the characteristics of the concept nor does it imply that no alternative minimal definition can be offered (e.g., "animal is any organism with a backbone").
- 53 It will not escape notice that reference is made only to necessary, not to "sufficient" characteristics. The latter requirement would involve us in unnecessary, if not also unmanageable, intricacies.
- 54 In particular, if "concept" is identified with "meaning," it would be contradictory to hold that a concept – that is, a meaning – can have many meanings.
- 55 This is certainly the case when a concept can be formulated in altogether different fashions. For example, Euclidean geometry can be axiomatized in a number of equivalent ways; and, similarly, the logic of propositions can be presented in equivalent ways that still represent the same concept.
- 56 Reference is especially made to the late Wittgenstein of the *Philosophical Investigations*. However, it is very dubious whether even the earlier Wittgenstein of the *Tractatus Logico-Philosophicus* of 1921–22 had any interest in or understanding of what science is about.
- 57 For example, "nobody has yet killed his own successor" is analytically true (i.e., its truth-value hinges entirely on the definitions of "successor" and "killing"). A successor, in order to be such, must be alive. Hence, he has not been killed and, indeed, must not (by definition) be dead.
- 58 The importance of this distinction can hardly be exaggerated. It was Reichenbach (1947) who first distinguished between context of discovery and context of justification. However, most authors currently substitute the latter expression with "context of validation" or confirmation.

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