CHAPTER THREE: Language: Meaning and Definition

Introduction: In order to construct, analyze, and evaluate arguments well, one must pay close attention to language. Many errors of logic stem from a careless or imprecise use of language, and many misunderstanding of logic stem from misunderstanding from the nature of language. This chapter provides a series of clarifications about the relationships between logic and language.

2.1 **Varieties of Meaning**

Ordinary language, as most of us are at least vaguely aware, serves various functions in our day-to-day lives. The twentieth-century philosopher Ludwig Wittgenstein thought the number of these functions to be virtually unlimited. Thus, among many other things, language is used to:

ask questions	flirt with someone	guess at answers	form hypotheses
tell jokes	launch verbal assaults	sing songs	issue commands
tell stories	give directions	tell lies	greet someone

For our purpose, **two** linguistic functions are particularly important (1) **to convey information** and (2) **to express or evoke feelings**. Consider, for example, the following statements:

> **The death penalty**, which is legal in thirty-six states, has been carried out most often in Georgia; however, since 1977 Texas holds the record for the greatest number of executions.

> **The death penalty** is a cruel and inhuman form of punishment in which hapless prisoners are dragged from their cells and summarily slaughtered only to satiate the bloodlust of a vengeful public.

The first statement is intended primarily to convey information about the death penalty, while the second is intended to persuade us that the death penalty is bad. The second accomplishes this function by engaging our feelings and not as in an argument, by establishing the truth of a claim.

These statements accomplish their respective functions through the distinct kinds of **terminology** in which they are phrased. Terminology that conveys information is said to have cognitive meaning, and terminology that expresses or evokes feelings is said to have emotive meaning. Thus, in the first statement the words "legal,""thirty-six,""most often," "Georgia," "record," and so on have primarily a cognitive meaning, while in the second statement the words "cruel," "inhuman," "hapless," "dragged," "slaughtered," "bloodlust," and "vengeful" have a strong emotive meaning. Of course, these latter words have cognitive meaning as well. "Cruel" means tending to hurt others, "inhuman" means inappropriate for humans, "hapless" means unfortunate, and so on.

The emotively charged statement about the death penalty illustrates **two** important points. The **first** is that statements of this sort usually have *both* cognitive meaning and emotive meaning. Therefore, since logic is concerned chiefly with cognitive meaning, we must be able to distinguish and disengage the cognitive meaning of such statements from the emotive meaning. The **second** point is that part of the cognitive meaning of such statements is a value claim. A value claim is a claim that something is good, bad, right, wrong, or better or worse, more important or less important than some other thing. For example, the statement about the death penalty asserts the value claim that the death penalty is wrong or immoral. Such value claims are often the most important part of the cognitive meaning of emotive statements. Thus, for the purposes of logic, we must be able to disengage the value claims of emotively charged statements from the emotive meaning and treat these claims as separate statements.

These observations suggest the reason that people use emotive terminology as often as they do: Value claims as such normally require evidence to support them. For example, the claim that the death penalty is immoral cannot simply stand by itself. It cries out for reasons to support it. But when value claims are couched in emotive terminology, the emotive "clothing" tends to obscure the fact that a value claim is

being made, and it simultaneously gives psychological momentum to that claim. As a result, readers and listeners are inclined to swallow the value claim whole without any evidence. Furthermore, the intellectual laziness of many speakers and writers, combined with their inability to supply supporting reasons for their value claims, reinforces the desirability of couching such claims in emotive terminology.

Many people, for example, will refer to someone as "crazy," "stupid," or "weird" when they want to express the claim that what that person is doing is bad or wrong and when they are unable or unwilling to give reasons for this claim. Also, many people will use such words as "awesome" or "fantastic" to express the claim that something is good. Those who happen to be listening, especially if they are friendly with the speaker, will often accept these claims without hesitation.

For a subtler example of emotive terminology, consider the word "harvest." This word evokes feelings associated with honest, hardworking farmers being rewarded for their labor in planting and tending their crops. To capitalize on this positive feeling, wood products companies speak of harvesting the trees in 200-year-old forests, even though they had nothing to do with planting them, and surgeons speak of harvesting the organs from the bodies of donors and the tissue from aborted fetuses. In all of these cases, the use of the word "harvest" is specifically calculated to elicit a favorable or agreeable response from the listener.

Let us now consider emotive terminology as it occurs in arguments. In arguments, emotive terminology accomplishes basically the same function as it does in statements. It allows the arguer to make value claims about the subject matter of the argument without providing evidence, and it gives the argument a kind of steamroller quality by which it tends to crush potential counterarguments before the reader or listener has a chance to think of them. This steamroller quality also tends to paralyze the logical thought processes of readers or listeners so that they are not able to see illogical arguments in their true light. These effects of emotive terminology can be avoided if the reader or listener will disengage the value claims and other cognitive meanings from the emotive meaning of the language and re-express them as distinct premises.

Consider, for example, the following emotively charged argument taken from the letters to the editor section of a newspaper:

> Now that we know that the rocks on the moon are similar to those in our backyard and that tadpoles can exist in a weightless environment, and now that we have put the rest of the world in order, can we concentrate on the problems here at home? Like what makes people hungry and why is unemployment so elusive? (R. J. Boland)

The conclusion of this argument is that our government should take money that has been spent on the space program and on international police actions and redirect it to solving domestic problems. The author minimizes the importance of the space program by covertly suggesting that it amounts to nothing more than work on ordinary rocks and tadpoles (which by themselves are relatively insignificant), and he exaggerates the scope of the international effort by covertly suggesting that it has solved every problem on earth but our own. Also, the phrase "put ... in order" suggests that the international effort has been no more important than restoring order to a room in one's house. We might rephrase the argument in emotively neutral language, making the implicit suggestions and value claims explicit, as follows:

> The space program has been confined to work on ordinary rocks and tadpoles. Ordinary rocks and tadpoles are less important than domestic hunger and unemployment.
> Our international efforts have restored order to every nation on earth but our own. These efforts have been directed to problems that are less important than our own domestic problems.
> Therefore, our government should redirect funds that have been spent on these projects to solving our own domestic problems.

By restructuring the argument in this way, we can more easily evaluate the degree to which the premises support the conclusion. Inspection of the premises reveals that the first, third, and possibly fourth premises are false. Thus, the actual support provided by the premises is less than what we might have first

expected. If the argument were to be rephrased a second time so that the premises turned out true (for example, the first premise might read *"Part* of the space program has been devoted to research on ordinary rocks and tadpoles"), the support given to the conclusion would still be weaker than the author intended.

Now that we have distinguished emotive meaning from cognitive meaning, let us explore some of the ways that cognitive meanings can be defective. **Two of them are vagueness and ambiguity**. A vague expression is one that allows for borderline cases in which it is impossible to tell if the expression applies or does not apply. Vague expressions often allow for a continuous range of interpretations. The meaning is hazy, obscure, and imprecise. For example, words such as "love," "happiness," "peace," "excessive," "fresh," "rich," "poor," "normal," "conservative and "polluted" are vague. We can rarely tell with any precision whether they apply to a given situation or not. How fresh does something have to be in order to be called fresh?

Vagueness can also affect entire statements. Such vagueness may arise not so much from the individual words as from the way in which the words are combined. For example, suppose someone was to say,
"Today our job situation is more transparent." First, what is the meaning of "job situation"? Does it refer to finding a job, keeping a job, filling a job, completing a job, or bidding on a job? And what exactly does it mean for a job situation to be "transparent"? Does it mean that the job is more easily perceived or comprehended? That the job is more easily completed? That we can anticipate our future job needs more clearly? Or what else?
Not all cases of vagueness, however, are problematic. To describe an acquaintance as "tall" or "thin" often causes no trouble in ordinary conversation. Indeed, it may be burdensome to describe this person in more precise language. Trouble arises only when the language is not sufficiently precise for what the situation demands.
The other way in which cognitive meanings can be defective is ambiguity. An ambiguous expression is one that can be interpreted as having more than one clearly distinct meaning in a given context. For example, words such as "light," "proper," "critical," "stress," "mad," "inflate," "chest," "bank," "sound," and "race" can be used ambiguously. Thus, if one were to describe a beer as a light pilsner, does this mean that the beer is light in color, light in calories, or light in taste? If one were to describe an action as proper, does this mean proper in a moral sense or proper in the sense of being socially acceptable? Or if one were to describe a person as critical, does this mean that the per-son is essential for a certain task or that the person tends to criticize others?

As is the case with vagueness, ambiguity can also affect entire statements. Such ambiguity often results from the way in which certain words are combined. For example, there was a newspaper headline that read, "Tuna are biting off the Washington coast." Does this mean that the tuna are nibbling away at the coastline or that fishermen are catching them off the coast? Presumably it means the latter. Another headline read, "College students are turning to vegetables." Does this mean that the students are metamorphosing into vegetables or that they are incorporating more vegetables into their diet? Again, the intended meaning is probably the latter.

The difference between **ambiguity and vagueness** is that vague terminology allows for a relatively continuous range of interpretations, whereas ambiguous terminology allows for multiple discrete interpretations. A vague expression creates a blur of meaning, whereas an ambiguous expression mixes up otherwise clear meanings. However, many forms of expression are ambiguous in one context and vague in another. For example, the word "slow" in one context could mean either mentally retarded or physically slow, but when the word refers to physical slowness, it could be vague. How slow is slow? Similar remarks apply to "light," "fast," and "rich."

The role of vagueness and ambiguity in arguments may be conveniently explored in the context of conflicting arguments between individuals. Such conflicts are called **disputes**:

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CLAUDIA: Mrs. Wilson abuses her children. And how do I know that? I saw her spank one of her kids the other day after the kid misbehaved.

JANE: Don't be silly. Kids need discipline, and by disciplining her children, Mrs. Wilson is showing that she loves them.

Here the problem surrounds the vagueness of the words "abuse" and "discipline." When does discipline become abuse? The line separating the two is hazy at best, but unless it is clarified, disputes of this sort will never be resolved. **Another example:**

BRENDA: I'm afraid that Smiley is guilty of arson. Last night he confided to me that he was the one who set fire to the old schoolhouse.

WARREN: No, you couldn't be more mistaken. In this country no one is guilty until proven so in a court of law, and Smiley has not yet even been accused of anything.

In this case the dispute arises over the ambiguity of the word "guilty." Brenda is using the word in the moral sense. Given that Smiley has admitted to setting fire to the old schoolhouse, it is very likely that he did indeed set fire to it and therefore is guilty of arson in the moral sense of the term. Warren, on the other hand, is using the word in the legal sense. Because Smiley has not been convicted in a court of law, he is not legally guilty of anything.

Disputes that arise over the meaning of language are called **verbal disputes**. But not all disputes are of this sort. Some disputes arise over a disagreement about facts, and these are called **factual disputes.** Example:

KEITH: I know that Freddie stole a computer from the old schoolhouse. Barbara told me that she saw Freddie do it.

PHYLLIS: That's ridiculous! Freddie has never stolen anything in his life. Barbara hates Freddie, and she is trying to pin the theft on him only to shield her criminal boyfriend.

Here the dispute centers on the factual issues of whether Barbara told the truth and whether Freddie stole the computer.

In dealing with disputes, the first question is whether the dispute is factual, verbal, or some combination of the two. If the dispute is verbal, then the second question to be answered is whether the dispute concerns ambiguity or vagueness.
Exercises are canceled. Please read it from the book!

2.2 The Intension and Extension of Terms

The main task of logic is the evaluation of arguments. However, as we saw in the previous section, there are countless arguments in which this task leads to the observation, "Well, that depends on what you mean by . . ." Such an observation usually indicates that the meaning of certain words in the argument is vague or ambiguous. Clearing up the problem often involves supplying a definition. Thus, the study of meaning and definition is closely related to the main task of logic. In this section we continue our inquiry into aspects of linguistic meaning, and the results of this inquiry provide the basis for the theory of definition in the next section.

The basic units of any ordinary language are **words.** Our main concern in this chapter, however, is not with words in general but with terms. **A term** is any word or arrangement of words that may serve as the subject of a statement. Terms consist of proper names, common names, and descriptive phrases. Here are some examples:

Proper names	Common names	Descriptive phrases first
Napoleon	restitution	president of the United States
North Dakota	person	author of *Hamlet*
The United States Senates	house	blue things
Gore Vidal	animal	books in my library
Barack Obama	activity	officers in the Swiss Navy

Words that are not terms include **verbs, non-substantive adjectives, adverbs, prepositions, conjunctions, and all non-syntactic** arrangements of words. The following words or phrases are not terms; none can serve as the subject of a statement:

    dictatorial   moreover   runs quickly   craves   above and beyond   cabbages into again the forest

The last example is a non-syntactic arrangement.

At this point it is important to distinguish the **use** of a word from the **mention** of a word. Without this distinction any word can be imagined to serve as the subject of a statement and, therefore, to count as a term. The word "wherever," for example, is not a term, but "wherever" (in quotes) can serve as the subject of a statement, such as

"'Wherever' is an eight-letter word." But in this statement, it is not the word itself that is the subject but rather the *quoted* word. The word is said to be *mentioned—not used.* On the other hand, "wherever" is *used* in this statement: "I will follow you wherever you go." In distinguishing terms from non-terms one must be sure that the word or group of words can be *used* as the subject of a statement.

The previous section of this chapter explored the cognitive meaning of language in general. **The cognitive meaning of terms comprises two kinds**: intensional and extensional.

The intensional meaning, or intension, consists of the qualities or attributes that the term *connotes.*
T**he extensional meaning, or extension**, consists of the members of the class that the term *denotes*

For example, the intensional meaning of the term "cat" consists of the attributes of being furry, of having four legs, of moving in a certain way, of emitting certain sounds, and so on, while the extensional meaning consists of cats themselves—all the cats that exist. The term connotes the attributes and denotes the cats.

The intensional meaning of a term is otherwise known as the **connotation.**
The extensional meaning is known as the **denotation**.

Intension and *extension* are roughly equivalent to the more modern terms *sense* and *reference,* respectively. Also, note that logic uses the terms *connotation* and *denotation* differently from the way they are used in grammar. In grammar, *connotation* refers to the subtle nuances of a word, whereas *denotation* refers to the word's direct and specific meaning.

        Denotes ←---------------------- inventor ---------------→connotes

Thomas Edison, Alexander G Bell Isaacs Newton, Wright brothers		Clever, Intuitive Creative, Imaginative

Exactly how a term connotes a set of attributes allows for at least two different interpretations. Some philosophers take an objective approach and hold that a term connotes whatever attributes something must have in order to be denoted by the term. Others take what might be called a subjective approach and hold that a term connotes the attributes that occur in the minds of the people who use that term. This book takes the latter approach.

In connection with this approach, however, we encounter the problem of terms **connoting different things to different people.** Thus, to a cat lover the term "cat" might connote the attributes of being cuddly and adorable, while to someone who hates cats it might connote the attributes of being obnoxious and disgusting. To avoid this problem, we restrict the meaning of connotation to what is usually called the conventional connotation. **The conventional connotation** of a term includes the attributes that the term *commonly* calls forth in the minds of competent speakers of the language. Under this interpretation, the connotation of a term remains more or less **the same from person to person and from time to time**.

The denotation of a term also typically remains the **same from person to person, but it may change over time.** The denotation of "currently living cat," for example, is constantly *fluctuating,* as some cats die and others are born. The denotation of the term "cat;' on the other hand, is presumably constant because it denotes all cats—past, present, and future.

Sometimes the denotation of a term can **change radically** with the passage of time. The terms "currently living dodo bird" and "current king of France," for example, at one time denoted actually existing entities, but today all such entities have perished. Accordingly, these terms now have what is called **empty extension**. They are said to denote the empty (or "null") class, the class that has no members. Other terms with empty extension include "unicorn," "leprechaun," "elf," and "griffin." While these terms have empty extension, however, they do not have empty intension. "Currently living dodo bird" and "current king of France," as well as "unicorn," "elf," and "griffin:" connote a variety of intelligible attributes.

The fact that some terms have empty extension leads us to an important connection between extension and intension—namely, that **intension determines extension.** The intensional meaning of a term serves as the *criterion* for deciding what the extension consists of. Because we know the attributes connoted by the term "unicorn," for example, we know that the term has empty extension. That is, we know that there are no four-legged mammals having a single straight horn projecting from their forehead. Similarly, the intension of the word "cat" serves as the criterion for determining 'what is' and 'what is not' a member of the class of cats.

One kind of term that raises problems for the intension-determines-extension rule is **proper** names. For example, the name "David" might not appear to have any intension, but it denotes the person who has this name. Although philosophers have disagreed about this, it would seem that proper names must have some kind of intension or we would not know what persons, if any, they denote. One possible solution to this problem is that names are shorthand symbols for descriptions or bundles of descriptions. For example, "David" could be shorthand for "the person who lives next door" or "the person who works at the corner store and who drives a green Chevy."

Another possible solution to the problem of proper names is that the intension of proper names consists of the causal chain of events leading from the point at which the name is first assigned to the point at which a certain person learns about the name. Thus, the first link in such a chain might be the baptismal event at which the name "David" is given to a certain infant; the second link would be the event in which a certain third party is informed of the first event, and so on. This entire chain of events extending through the linguistic community would then constitute the intension of "David." Thus, we conclude that for all terms, including proper names, intension determines extension.

The distinction between intension and extension may be further illustrated by comparing the way in which these concepts can be used to give *order to random sequences of terms*. Terms may be put in the order of increasing intension, increasing extension, decreasing intension, and decreasing extension.

> **A series of terms is in the order of increasing intension** when each term in the series (except the first) *connotes more attributes* than the one preceding it.

In other words, each term in the series after the first is *more specific* than the one preceding it. (A term is specific to the degree that it connotes more attributes.) The order of decreasing intension is the reverse of that of increasing intension.

> **A series of terms is in the order of increasing extension** when each term in the series (except the first) denotes *a class having more members* than the class denoted by the term preceding it.

In other words, it increases when the *class size gets larger* with each successive term. Decreasing extension is, of course, the reverse of this order. Examples:

Increasing intension:	animal→ mammal→ feline→ tiger
Decreasing intension:	tiger→ feline→ mammal→ animal
Increasing extension:	tiger→ feline→ mammal→ animal
Decreasing extension:	animal→ mammal→ feline→ tiger

These examples illustrate a fact pertaining to most such series: The order of increasing intension is usually the same as that of decreasing extension. Conversely, the order of decreasing intension is usually the same as that of increasing extension. **There are some exceptions**, however. Consider the following series:

> unicorn →unicorn with blue eyes→ unicorn with blue eyes and green horn→ unicorn with blue eyes, green horn, and a weight of over 400 pounds

Each term in this series has **empty extension**; so, while the series exhibits the order of increasing intension, it does not exhibit the order of decreasing extension. Here is an-other, slightly different, example:

> living human being→ living human being with a genetic code→ living human being with a genetic code and a brain→ living human being with a genetic code, a brain, and a height of less than 100 feet

In this series none of the terms has empty extension, but each term has exactly the same extension as the others. Thus, while the intension increases with each successive term, once again the extension does not decrease.

> **Exercises are canceled. Please read it from the book!**

2.3 Definitions and Their Purposes

Over the years philosophers have held various conflicting views about the purpose of definitions. For example, Plato claimed that definitions were intended to explicate the meaning of certain eternal essences or forms, such as justice, piety, and virtue. For most logicians today, however, **definitions are intended exclusively to explicate the meaning of *words*.** In conformity with this latter position, we may define definition as a group of words that assigns a meaning to some word or group of words. Accordingly, **every definition consists of two parts**: the definiendum and the definiens.

| **The definiendum** is the word or group of words that is supposed to be defined. |
| **The definiens** is the word or group of words that does the defining. |

For example, in the definition "'Tiger' means a large, striped, ferocious feline indigenous to the jungles of India and Asia," the word "tiger" is the definiendum, and everything after the word "means" is the definiens. The definiens is not itself the meaning of the definiendum; rather, it is the group of words that symbolizes (or that is supposed to symbolize) the *same* meaning as the definiendum. Because we presumably know in advance what the definiens symbolizes, we are led, via the definition, to understand what the definiendum symbolizes. It is in this way that the definition "assigns" a meaning to its definiendum.

Once it has been decided that definitions explicate the meaning of words, other disagreements emerge among the philosophers. Some argue that since a definition is merely a rule that allows one set of words (the definiens) to be used in place of another set (the definiendum), definitions communicate no information at all about the subject matter of the definiendum. Others take the opposite tack and argue that since definitions result in a clarification of language, they provide a means for the discovery of deeper philosophical truths. Regardless of the debate, many logicians take a **pragmatic approach** and begin with a survey of the various kinds of definitions that are actually used and of the **functions t**hat they actually serve. This is the approach taken here.

1. Stipulative Definitions

A stipulative definition **assigns a meaning to a word for the first time**. This may involve either **coining a new word or giving a new meaning to an old word.** It assigns meaning independently of convension or established use. **The purpose** of a stipulative definition is usually to replace a more complex

expression with a simpler one. For example, the word "Aereomobile" has no generally accepted meaning. But we could make a proposal of new name:

"Aereomobile" means a vehicle that is normally driven on the ground but that has the capability of flying through the air to avoid traffic congestion.

We could also make a proposal of old word with new meaning:

"Black hole" means a star that has completely collapsed in on itself due to gravitational forces.

The need for a stipulative definition is often **occasioned by some new phenomenon or development**. For example, a few years ago the attempt was made at a certain zoo to crossbreed tigers and lions. Because of the genetic similarity of the two species, the attempt succeeded. Offspring were produced from a male tiger and a female lion and from a male lion and a female tiger. When the offspring were born, it became appropriate to give them names. Of course, the names "offspring of male tiger and female lion" and "offspring of male lion and female tiger" could have been used, but these names were hardly convenient. Instead, the names "tigon" and "liger" were selected. Any two new words would have sufficed equally well for naming the offspring-"topar" and "largine" for example—but "tigon" and "liger" were considered more appropriate, for obvious reasons. "Tigon" was taken to mean the offspring of a male tiger and a female lion, and "liger" the offspring of a male lion and a female tiger. These assignments of meanings were accomplished through stipulative definitions.

Another purpose of stipulative definitions is **to set up secret codes**. For example, during World War II, "Tora, Tora, Tora" was the code name Admiral Yamamoto transmitted to the war office in Tokyo signaling that the Japanese fleet had not been spotted in the hours preceding the bombing of Pearl Harbor; "Operation Barbarossa" was the name the Germans gave to the invasion of Russia; and "Operation Overlord" was the name the allied forces gave to the planned invasion of Normandy. More recently, "Operation Desert Storm" was the code name given to the military invasion of Iraq; the campaign in Afghanistan, at least in its early phase, was called "Operation Enduring Freedom." Law enforcement organizations have adopted similar code names for sting operations against organized crime.

Because people are continually coming up with **new creations**, whether it is food concoctions, inventions, modes of behavior or kinds of apparel, stipulative definitions are continually being introduced to name them. The invention of computers provides a prime example. Today we have dozens of new terms or new uses of old terms that did not exist a few years ago: "cyberspace," "e-mail," "browser," "hacker," "dot-com," "hardware," "software," "download," "website," "server," "boot" "bar code," "mouse," "modem," "cookies," and "spam"—to name just a few. Earlier, in the area of biology, when a certain excretion of the pancreas was refined to its pure form, the word "insulin" was chosen to name it, and the word "penicillin" was chosen for an antibacterial substance produced by certain *Penicillium* molds. In mathematics, the symbol "10^5" was chosen as a simple substitute for "$10\times10\times10\times10\times10$."

Stipulative definition is a recommendation or proposal to use a term in a certain way, having the form "Let's use term *X* to mean…" Because a stipulative definition is **a completely arbitrary assignment of a meaning to a word for the first time,** there can be **no** such thing as a *"true" or "false"* stipulative definition. Furthermore, for the same reason, a stipulative definition **cannot provide any new information about the subject matter of the definiendum.** The fact that the word "tigon" was selected to replace "offspring of a male tiger and a female lion" tells us nothing new about the nature of the animal in question. One stipulative definition may, however, be more or less convenient or more or less appropriate than another.

On the other hand, if the proposal to use a term in a certain manner takes hold and becomes part of established use, then it is not any more stipulative but it becomes Lexical definition.

Stipulative definitions are misused in *verbal disputes* when one person covertly uses a word in a peculiar way and then proceeds to assume that everyone else uses that word in the same way. Under these circumstances that person is said to be using the word "stipulatively."

2. Lexical Definitions

A lexical definition is **used to report the meaning that a word already has in a language**. **Dictionary definitions** are all instances of lexical definitions. Thus, in contrast with a stipulative definition, which assigns a meaning to a word for the first time, a lexical definition **may be true or false** depending on whether it does or does not report the way a word is actually used. Because words are frequently used in more than one way, lexical definitions have the further **purpose of eliminating the ambiguity** that would otherwise arise if one of these meanings were to be confused with another.

As we saw in the first section of this chapter, an expression is **ambiguous** when it can be **interpreted as having two or more clearly distinct meanings in a given context**. Words such as "*light," "mad," and "bank"* can be used ambiguously. Because a lexical definition lists the various meanings that a word can have, a person who consults such a definition is better prepared to avoid ambiguous constructions of his or her own and to detect those of others. Undetected ambiguity causes the most trouble. In many cases the problem lies not with the obvious differences in meaning that words such as "*light" and "bank*" may have but with the subtle shadings of meaning that are more likely to be confused with one another. For example, if a woman is described as "*nice*," any number of things could be intended. She could be fastidious, refined, modest, pleasant, attractive, or even lewd. A good lexical definition will distinguish these various shadings and thereby guard against the possibility that two such meanings will be un-consciously jumbled together into one. For example:

"Imminent" means about to occur
"Error" means mistake

3. Précising Definitions

The purpose of a precising definition is **to reduce the vagueness of a word**. As we saw in the first section of this chapter, an expression is *vague* if there are **borderline cases** in which **it is impossible to tell if the word applies or does not apply**. Words such as *"fresh," "rich" and "poor"* are vague. Once the vagueness of such words is reduced by a precising definition, one can reach a decision as to the applicability of the word to a specific situation. For example, if legislation were ever introduced to give direct financial assistance to the poor, a precising definition would have to be supplied specifying exactly who is poor and who is not. The definition "'Poor' means having an annual in-come of less than $4,000 and a net worth of less than $20,000" is an example of a precising definition.

Whenever words are taken from ordinary usage and used in a highly systematic context such as science, mathematics, medicine, or law, they *must always be clarified by means of a precising definition*. The terms "force," "energy," "acid," "element," "number," "equality," "contract," and "agent" have all been given precising definitions by specific disciplines.

For example, sometimes the substance of a court trial may revolve around the precise usage of a term. A trial in California addressed the question of whether a man who had ridden a bicycle while intoxicated violated the motor vehicle code. The question concerned whether, for these purposes, a bicycle could be considered a "vehicle." The court decided in the affirmative, and the decision amounted to an incremental extension of an already existent precising definition of the word "vehicle:'

Another example involves the practice of surgical transplantation of vital organs. Before a heart transplant can be conducted, the donor must be dead; otherwise, the surgeon will be accused of murder. If the donor is dead for too long, however, the success of the transplant will be imperiled. But exactly when is a person considered to be dead? Is it when the heart stops beating, when the person stops breathing, when rigor mortis sets in, or some other time? The question involves the meaning of the term "moment of death." The courts have decided that "moment of death" should be taken to mean the moment the brain stops functioning, as measured by an electroencephalo-graph. This decision amounts to the acceptance of a precising definition for "moment of death."

A precising definition differs from a stipulative definition in that the latter involves a purely arbitrary assignment of meaning, whereas the assignment of meaning in a precising definition is not at all arbitrary. A great deal of care must be taken to ensure that the assignment of meaning in a precising definition is appropriate and legitimate for the context within which the term is to be employed. For example in a lexical definition, "velocity" means "speed." But physicists have given it a more précising meaning for their purpose. Accordingly,

"Velocity" means rate of motion in a particular direction
A "dead" person is, for legal purpose, one whose brain functions have permanently ceased
"Intoxicated," for purposes of driving a car in many states in the USA, means having a blood-alcohol content of 0.1 percent (.001) or greater.

Note: the opening words of almost all legal documents enacted by legislative organs of both FDRE and States begin with précising definition. For instance, a Federal Family code begins with defining words such as "family", "father", "mother", "daughter" and so on.

4. Theoretical Definitions

A theoretical definition **assigns a meaning to a word by suggesting a theory that gives a certain characterization to the entities that the term denotes.** Such a definition provides a way of viewing or conceiving these entities that **suggests deductive consequences, further investigation** (experimental or otherwise), and whatever else would be entailed by the acceptance of a theory governing these entities.

For instance, the definition of the term "heat" found in texts dealing with the kinetic theory of heat provides a good example: "'Heat' means the energy associated with the random motion of the molecules of a substance." This definition does more than merely assign a meaning to a word; it provides a way of conceiving the physical phenomenon that is heat. In so doing, it suggests the deductive consequence that - as the molecules of a substance speed up, the temperature of the substance increases. In addition, it suggests a number of experiments—experiments investigating the relationship between molecular velocity and the phenomena of radiation, gas pressure, molecular elasticity, and molecular configuration. In short, this definition of "heat" provides the impetus for an entire theory about heat.

Other examples of theoretical definitions are the definition of "light" as a form of electromagnetic radiation and the definition of "force," "mass," and "acceleration" in Newton's second law of motion as expressed in the equation *"F* = MA." The latter is a kind of contextual definition in which each term is defined in terms of the other two. Both definitions entail numerous deductive consequences about the phenomena involved and suggest numerous avenues of experimental investigation.

Not all theoretical definitions are associated with *science.* Many terms in *philosophy*, such as "substance," "form," "cause," "change," "idea," "good," "mind," and "God," have been given theoretical definitions. In fact, most of the major philosophers in history have given these terms their own peculiar theoretical definitions, and this fact accounts in part for the unique character of their respective philosophies. *For example,* Gottfried Wilhelm Leibniz's definition of "substance" in terms of what he called "monads" laid

the foundation for his metaphysical theory, and John Stuart Mill's definition of "good" as the greatest happiness of the greatest number provided the underpinnings for his utilitarian theory of ethics.

Like stipulative definitions, theoretical definitions are **neither true nor false,** strictly speaking. The reason is that stipulative definitions function as proposals to see or interpret some phenomenon in a certain way. Since proposals have no truth value, neither do theoretical definitions. They may, however, be more or less interesting or more or less fruitful, depending on the deductive consequences they entail and on the outcome of the experiments they suggest. For example:

"Justice" means giving each individual his or her due
"Virtues" means traits enabling one to live well.

5. Persuasive Definitions

The purpose of a persuasive definition is **to engender a favorable or unfavorable attitude toward what is denoted by the definiendum**. This purpose is accomplished by assigning an **emotionally charged** *or value-laden* meaning to a word while making it appears that the word really has (or ought to have) that meaning in the language in which it is used. Thus, persuasive definitions amount to a certain **synthesis of stipulative, lexical, and, possibly, theoretical definitions** backed by the **rhetorical motive** to engender a certain attitude. As a result of this synthesis, a persuasive definition masquerades as an honest assignment of meaning to a term while *condemning or blessing* with approval the subject matter of the definiendum. Here are some examples of op-posing pairs of persuasive definitions:

"Abortion" means the ruthless murdering of innocent human beings.
"Abortion" means a safe and established surgical procedure whereby a woman is relieved of an unwanted burden.

"Liberal" means a drippy-eyed do-gooder obsessed with giving away other people's money.
"Liberal" means a genuine humanitarian committed to the goals of adequate housing and health care and of equal opportunity for all of our citizens.

"Capitalism" means the economic system in which individuals are afforded the God-given freedom to own property and conduct business as they choose.
"Capitalism" means the economic system in which humanity is sacrificed to the wanton quest for money, and mutual understanding and respect are replaced by alienation, greed, and selfishness.

"Taxation" means the procedure by means of which our commonwealth is preserved and sustained.
"Taxation" means the procedure used by bureaucrats to rip off the people who elected them.

The objective of a persuasive definition is to **influence the attitudes** of the reader or listener; thus, such definitions may be used with considerable effectiveness in political speeches and editorial columns. While persuasive definitions may, like lexical definitions, be *evaluated as either true or false*, the primary issue is neither truth nor falsity but the effectiveness of such definitions as instruments of persuasion.
Exercises are canceled. Please read it from the book!

2.4 Definitional Techniques

In the previous section we presented a survey of some of the kinds of definitions actually in use and the functions they are intended to serve. In this section we will investigate some of the techniques used to produce these definitions. These techniques may be classified in terms of the two kinds of meaning, intensional and extensional.

I. Extensional (Denotative) Definitions

An extensional (denotative) definition is one that assigns a meaning to a term by indicating the members of the class that the definiendum denotes. There are at least three ways of indicating the members of a class: pointing to them, naming them individually, and naming them in groups. **The three kinds of definitions** that result are called, respectively, demonstrative or ostensive definitions, enumerative definitions, and definitions by subclass.

1. **Demonstrative (ostensive) definitions** are probably the most primitive form of definition. All one need know to understand such a definition **is the meaning of pointing**. As the following examples illustrate, such definitions may be either **partial or complete,** depending on whether all or only some of the members of the class denoted by the definiendum are pointed to:

> "Chair" means this and this and this—as you point to several chairs, one after the other.
> "Washington Monument" means that—as you point to it.
>
> ''House'' means this:

If you were attempting to teach a foreigner your own native language, and neither of you understood a word of each other's language, demonstrative definition would almost certainly be one of the methods you would use.

Because demonstrative definitions are the most *primitive*, they are also the most **limited.** In addition to the limitations affecting all extensional definitions (which will be discussed shortly), there is the obvious limitation that *the required objects be available for being pointed at*. For example, if one wish to define the word "sun" and it happens to be nighttime, or the word "dog" and none happens to be in the vicinity, a demonstrative definition cannot be used.

Demonstrative definitions **differ from** the other kinds of definitions in that the definiens is constituted at least in part **by a gesture**—the gesture of pointing. Since the definiens in any definition is a group of words, however, a gesture, such as pointing, must count as a word. While this conclusion may appear strange at first, it is supported by the fact that the "words" in many sign languages consist exclusively of gestures.

2. **Enumerative definitions** assign a meaning to a term by **naming the members of the class the term denotes.** Like demonstrative definitions, they may also be either **partial or complete**. Examples:

> "African state" means Ethiopia, Kenya, Nigeria, South Africa, Libya, Congo DR or Angola.
> "Philosopher" means a person such as Socrates, Aristotle, Plato, John Locke, Kant, and so on.
> "Athlete" means a person such as Abebe Bikila, Darartu Tulu, Haile G/Sellasia, or Turunesh Dibaba.
> "Scandinavia" means Denmark, Sweden, Norway, Finland, Iceland, and the Faroe Iceland.

The first three are partial, the last complete. Complete enumerative definitions are usually more satisfying than partial ones because they identify the definiendum with greater assurance. Relatively few classes, however, can be completely enumerated. Many classes, such as the class of real numbers greater than 1 but less than 2, have an infinite number of members. Others, such as the class of stars and the class of persons, while not infinite, have still too many members to enumerate. Therefore, anything approximating a complete enumerative definition of terms denoting these classes is clearly **impossible.** Then there are others—the class of insects and the class of trees, for example—the vast majority of whose members have no names. For terms that denote these classes, either a demonstrative definition or a definition by subclass is the more appropriate choice.

3. **A definition by subclass** assigns a meaning to a term **by naming subclasses of the class denoted by the term**. Such a definition, too, may be either **partial or complete**, depending on whether the subclasses named, when taken together, include all the members of the class or only some of them.

Examples:
    "Tree" means an oak, pine, elm, spruce, maple, and the like.
    "Professional person" means a person such as lawyer, an engineer, an accountant, a professor, and the like.
    "Feline" means tigers, lions, leopards, panthers, house cats, bobcats, cheetahs, and the like.
    "Fictional work" means a poem, a play, a novel, or a short story.

The first three are partial, the last complete. As with definitions by enumeration, complete definitions by subclass are more satisfying than partial ones; but because relatively few terms denote classes that admit of a conveniently small number of subclasses, complete definitions by subclass are often difficult, if not impossible, to provide.

Extensional definitions are chiefly used as techniques for producing **lexical and stipulative definitions**. Lexical definitions are aimed at communicating how a word is actually used, and one of the ways of doing so is by identifying the members of the class that the word denotes. Dictionaries frequently include references to the individual members (or to the subclasses) of the class denoted by the word being defined. Sometimes they even include a kind of demonstrative definition when they provide a picture of the object that the word denotes. Not all lexical definitions have to occur in dictionaries, however. A lexical definition can just as well be spoken, as when one person attempts to explain orally to another how a word is used in a language. Such attempts, incidentally, often have recourse to all three kinds of extensional definition.

Stipulative definitions are used to assign a meaning to a word for the first time. This task may be accomplished by all three kinds of extensional definition. For example, a biologist engaged in naming and classifying types of fish might assign names to the specific varieties by pointing to their respective tanks (demonstrative definition), and then she might assign a class name to the whole group by referring to the names of the specific varieties (definition by subclass). An astronomer might point via his telescope to a newly discovered comet and announce, "That comet will henceforth be known as 'Henderson's Comet— (demonstrative definition). The organizer of a children's game might make the stipulation: "John, Mary, and Billy will be called 'Buccaneers,' and Judy, George, and Nancy will be 'Pirates' " (enumerative definition).

Although it is conceivable that extensional definitions could also serve as techniques for **theoretical and persuasive definitions** (though this would be highly unusual), extensional definitions by themselves **cannot** properly serve as **precising definitions** for the following reason. The function of a precising definition is to clarify a vague word, and vagueness is a problem affecting intensional meaning. Because the intension is imprecise, the extension is indefinite. To attempt to render the intension precise by exactly specifying the extension (as with an extensional definition) would be tantamount to having extension determine intension—which cannot be done.

The principle that intension determines extension, whereas the converse is not true, underlies the fact that **all extensional definitions suffer serious deficiencies**. For example, in the case of the demonstrative definition of the word "chair," if all the chairs pointed to are made of wood, observers might get the idea that "chair" means "wood" instead of something to sit on. Similarly, they might get the idea that "Washington Monument" means "tall" or "pointed" or any of a number of other things. From the definition of "actress," readers or listeners might think that "actress" means "woman"—which would include countless individuals who have nothing to do with the stage or screen. From the definition of "tree" they might get the idea that "tree" means "firmly planted in the ground," which would also include the pilings of a building. And they might think that "cetacean" means "aquatic animal," which includes salmon, tuna, squid, manatees, and so on. In other words, it makes no difference how many individuals or subclasses are named in an extensional definition, there is no assurance that listener or readers will get the *intensional* meaning. Extensions can *suggest* intensions, but they cannot *determine* them.

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II.   Intensional (Connotative) Definitions

An intensional definition is one that assigns a meaning to a word by indicating the qualities or attributes that the word connotes. Because at least **four strategies** may be used to indicate the attributes a word connotes, there are at least four kinds of intensional definitions: synonymous definition, etymological definition, operational definition, and definition by genus and difference.

1. A synonymous definition is one in which the definiens is a single word that connotes the same attributes as the definiendum. In other words, the definiens is a synonym of the word being defined. Examples:

   "Physician" means doctor.
   "Intentional" means willful.
   "Voracious" means ravenous.
    "Observe" means see.

When a single word can be found that has the same intensional meaning as the word being defined, a synonymous definition is a highly concise way of assigning a meaning. Many words, however, have subtle shades of meaning that are **not connoted by any other single word**. For example, the word "wisdom" is not exactly synonymous with either "knowledge," "understanding," or "sense"; and "envious" is not exactly synonymous with either "jealous" or "covetous."

2. An etymological definition assigns a meaning to a word by **disclosing the word's ancestry in both its own language and other languages**. Most ordinary English words have ancestors either in old or middle English or in some other language such as Greek, Latin, or French, and the current English meaning (as well as spelling and pronunciation) is often closely tied to the meaning (and spelling and pronunciation) of these ancestral words.

   For example, the English word "*license"* is derived from the Latin verb *licere,* which means to be permitted, and the English word "captain" derives from the Latin noun *caput,* which means head.
   "Philosophy" is a word derived from two Greek words *philo* and *Sophia*, which means love and wisdom, respectively.

Etymological definitions have **special importance for at least two reasons**. The **first** is that the etymological definition of a word often conveys the *word's root meaning or seminal meaning from which all other associated meanings are derived.* Unless one is familiar with this root meaning, one often fails to place other meanings in their proper light or to grasp the meaning of the word when it is used in its most proper sense. For example, the word "principle" derives from the Latin word *principium,* which means beginning or source. Accordingly, the "principles of physics" are those fundamental laws that provide the "source" of the science of physics. The English word "efficient" derives from the Latin verb *efficere,* which means to bring about. Thus, the "efficient cause" of something (such as the motion of a car) is the agent that actually brings that thing about (the engine).

The **second** reason for the importance of etymological definitions is that *if one is familiar with the etymology of one English word, one often has access to the meaning of an entire constellation of related words.* For example, the word "orthodox" derives from the two Greek words *ortho,* meaning right or straight, and *doxa,* meaning belief or opinion. From this, one might grasp that "orthopedic" has to do with straight bones (originally in children—pais in Greek means child), and that "orthodontic" has to do with straight teeth *(odon* in Greek means tooth). Similarly, if one is familiar with the etymological definition of "polygon" (that is from the Greek words *poly,* meaning many, and *Banos* meaning angle), then he/she might grasp the meanings of "polygamy" (from *gamos,* meaning marriage) and "polygraph" (from *graphein,* meaning to write). A polygraph is a lie detector that simultaneously records pulse rate, blood pressure, respiration, and so on.

3. An operational definition assigns a meaning to a word by **specifying certain experimental procedures** that determine whether or not the word applies to a certain thing. Examples:

One substance is "harder than" another if and only if one scratches the other when the two are rubbed together.
A subject has "brain activity" if and only if an electroencephalograph shows oscillations when attached to the subject's head.
A "potential difference" exists between two conductors if and only if a voltmeter shows a reading when connected to the two conductors.
A solution is an "acid" if and only if litmus paper turns red when dipped into it.

Each of these definitions prescribes an **operation** to be performed. The first prescribes that the two substances in question be rubbed together, the second that the electroencephalograph be connected to the patient's head and observed for oscillations, the third that the voltmeter be connected to the two conductors and observed for deflection, and the fourth that the litmus paper be placed in the solution and observed for color change. Unless it specifies such an operation, a definition cannot be an operational definition. For example, the definition "A solution is an 'acid' if and only if it has a pH of less than 7," while good in other respects, is not an operational definition, because it prescribes no operation.

Operational definitions were invented **for the purpose of tying down relatively abstract concepts to the solid ground of empirical reality.** In this they succeed fairly well; yet, from the standpoint of ordinary language usage, they involve certain deficiencies. One of these deficiencies concerns the fact that operational definitions usually **convey only *part* of the intensional meaning** of a term. Certainly "brain activity" means more than oscillations on an electroencephalograph, just as "acid" means more than blue litmus paper turning red. This deficiency becomes more acute when one attempts to apply operational definitions to terms outside the framework of science. For example, no adequate operational definition could be given for such words as "love," "respect," "freedom," and "dignity." Within their proper sphere, however, operational definitions are quite useful and important. Interestingly Einstein developed his special theory of relativity in partial response to the need for an operational definition of simultaneity.

4. A definition by genus and difference assigns a meaning to a term by **identifying a genus term and one or more difference words** that, when combined, convey the meaning of the term being defined. Definition by genus and difference is more generally **applicable and achieves more adequate results** than any of the other kinds of intensional definition. To explain how it works, we must first explain the meanings of the terms *genus, species,* and *specific difference.*

In logic, genus and species have a somewhat different meaning than they have in biology. In logic, **genus** simply means a relatively larger class, and **species** means a relatively smaller subclass of the genus. For example, we may speak of the genus animal and the species mammal, or of the genus mammal and the species feline, or of the genus feline and the species tiger, or the genus tiger and the species Bengal tiger. In other words, genus and species are merely relative classifications.

The **specific difference, or difference**, is the attribute or attributes that distinguish the various species within a genus. For example, the specific difference that distinguishes tigers from other species in the genus feline would include the attributes of being large, striped, ferocious, and so on. Because the specific difference is what distinguishes the species, when a genus is qualified by a specific difference, a species is identified. Definition by genus and difference is based on this fact. It consists of combining a term denoting a genus with a word or group of words connoting a specific difference so that the combination identifies the meaning of the term denoting the species.

Let us construct a definition by genus and difference for the word "ice." The first step is to identify a genus of which ice is the species. The required genus is water. Next we must identify a specific difference

(attribute) that makes ice a special form of water. The required difference is frozen. The completed definition may now be written out:

Species   Difference   Genus
"Ice"   means   frozen   water.

A definition by genus and difference is easy to construct. Simply select a term that is more general than the term to be defined, and then narrow it down so that it means the same thing as the term being defined. Examples:

Species   Difference   Genus
"Daughter" means female   offspring.
"Husband" means married   man.
"Doe" means female   deer.
"Fawn" means very young   deer.
"Skyscraper" means very tall   building.
"Tent" means a collapsible shelter made of canvas or other material that is stretched and sustained by poles. (In the last example "Tent" is the species, "shelter" is the genus, and "collapsible" and "made of canvas . . ." the difference.)

Definition by **genus and difference** is the most effective of the intensional definitions for **producing the five kinds of definition** discussed in Section 2.3. Stipulative, lexical, precising, theoretical, and persuasive definitions can all be constructed according to the method of genus and difference. **Lexical definitions** are typically definitions by genus and difference, but they also often include **etymological definitions. Operational definition** can serve as the method for *constructing* **stipulative, lexical, precising, and persuasive definitions,** but because of the limitations we have noted, it typically could **not** be used to produce a **complete** lexical definition. Other techniques would have to be used in addition. **Synonymous definition** may be used to produce only lexical definitions. Since, in a synonymous definition, the definiendum must have a meaning before a synonym can be found, this technique cannot be used to produce stipulative definitions, and the fact that the definiens of such a definition contains no more information than the definiendum prohibits its use in constructing precising, theoretical, and persuasive definitions.

This account of definitions is inevitably incomplete. At the beginning of the chapter we saw that all words—not just terms—stand in need of definitions, but the account given here is based on the intension and extension of *terms*. Nevertheless, many of the techniques developed here can be applied to words in general, and even to symbols. For example, Chapters 6 and 8 will present definitions of various symbols that are used in modern logic to connect one statement with another and to translate ordinary language statements into symbolic form. When logicians introduced these symbols many years ago, they did it through stipulative definitions. Also, as we will see in Chapter 6, some of these symbols are defined by certain tables, called *truth tables,* which establish each symbol's meaning under all possible arrangements of truth values. These definitions are probably best described as extensional, and they are similar in some ways to demonstrative definitions and enumerative definitions.

Table 2.1 Correlation of Definitional Techniques with Types of Definition

Can produce this type of definition This technique	Stipulative	Lexical	Precising	Theoretical	Persuasive
Demonstrative	yes	yes	no	(unusual)	(unusual)
Enumerative	yes	yes	no	(unusual)	(unusual)
Subclass	yes	yes	no	(unusual)	(unusual)
Synonymous	no	yes	no	no	no
Etymological	yes	yes	no	no	no

Source: Patrick J Hurley, (2008). **A Concise Introduction to Logic**. 10th Edition.USA

| Operational | (limited) | yes | yes | (unusual) | (unusual) |
| Genus & Difference | yes | yes | yes | yes | yes |

Exercises are canceled. Please read it from the book!

2.5 Criteria for Lexical Definitions

Because the function of a lexical definition is to report the way a word is actually used in a language, lexical definitions are the ones we most frequently encounter and are what most people mean when they speak of the "definition" of a word. Accordingly, it is appropriate that we have a set of rules that we may use in constructing lexical definitions of our own and in evaluating the lexical definitions of others. While some of these rules apply to the other kinds of definitions as well, the unique functions that are served by stipulative, precising, theoretical, and persuasive definitions prescribe different sets of criteria.

Rule 1: A Lexical Definition Should Conform to the Standards of Proper Grammar
A definition, like any other form of expression, should be grammatically correct. Examples of definitions that are grammatically *incorrect* are as follows:
    Vacation is when you don't have to go to work or school. Furious means if you're angry at someone.
    Cardiac is like something to do with the heart.
The corrected versions are these:
    "Vacation" means a period during which activity is suspended from work or school. "Furious" means a condition of being very angry.
    "Cardiac" means pertaining to, situated near, or acting on the heart

Technically the definiendum should be put in quotation marks or italics, but this convention is not always followed. More examples:
    "Semantics" is when somebody studies words.
    "God" means a being Pastor David often talks about.

Rule 2: A Lexical Definition Should Convey the Essential Meaning of the Word Being Defined
The word "**human**" is occasionally defined as **featherless biped**. Such a definition fails to convey the essential meaning of "human" as the word is used in ordinary English. It says nothing about the important **attributes that distinguish** humans from the other animals—namely, the capacity to reason and to use language on a sophisticated level. A more adequate definition would be:
    "'Human' means the animal that has the capacity to reason and to speak."

If a lexical definition is to be given in terms of an **operational definition** or in terms of any of the forms of extensional definition, it should usually be **supplemented by one of the other forms of intensional definition**, preferably definition by genus and difference. As noted, from the standpoint of ordinary language usage an operational definition often conveys only part of the intensional meaning of a word, and this part frequently misses the essential meaning altogether. As for extensional definitions, at best they can only *suggest* the essential meaning of a word; they cannot *determine* it precisely. As a result, no ad-equate lexical definition can consist exclusively of extensional definitions. More examples:
    "Nine" means the number of regional states in Ethiopia.
    "Triangle" means my favorite plane figure.

Rule 3: A Lexical Definition Should Be Neither Too Broad nor Too Narrow
If a definition is **too broad**, the definiens **includes too much**; if it is **too narrow**, the definiens **includes too little**. If, for example, "bird" were defined as any warm-blooded animal having wings, the definition would be too broad because it would include bats, and bats are not birds. If, on the other hand, "bird" were defined as any warm-blooded, feathered animal that can fly, the definition would be too narrow because it would exclude ostriches, which cannot fly.

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The only types of lexical definitions that tend to be susceptible to either of these **deficiencies** are **synonymous definitions and definitions by genus and difference**. With synonymous definitions, one must be careful that the definiens really is a synonym of the definiendum. For example, the definition "'king' means ruler" is too broad be-cause many rulers are not kings. "Ruler" is not genuinely synonymous with "king." As for definitions by genus and difference, one must ensure that the specific difference narrows the genus in exactly the right way. Both of the given definitions of "bird" are definitions by genus and difference in which the specific difference fails to restrict the genus in exactly the right manner. More examples:

"Pen" means an instrument used for writing on paper. (Narrow as well as broad)
A "painting" is a picture made with green colors. (Narrow)
A "valid" argument is one that has only true premises and hence true conclusion. (Narrow)
"Catholic" means Christian. (Broad)
A "valid" argument is one such that the premises support the conclusion. (Broad)

Rule 4: A Lexical Definition Should Avoid Circularity

A definition is circular when the definiendum is defined in terms of itself, or virtually in terms of itself. Sometimes the problem of circularity appears in connection with *pairs* of definitions. The following pair is circular:

"Scientist" means anyone who engages in science.

At other times a definition may be intrinsically circular. Of the following, the first is a synonymous definition, the second a definition by genus and difference:

"Soporific" means soporiferous.
'Jewelers' rouge" means rouge used by a jeweler.

In the first example, the definiendum is virtually the same word as the definiens. As a result, anyone who does not already know the meaning of "soporofic" would probably not know the meaning of "soporiferous," either. In the second example, "jewelers' rouge" is clearly defined in terms of itself. The corrected definitions are as follows:

"Soporific" means tending to cause sleep.

"Jewelers' rouge" means a very fine polishing compound. Certain operational definitions also run the risk of circularity: "Time" means whatever is measured by a clock.

Surely a person would have to know what "time" means before he or she could under-stand the purpose of a clock. More examples:

"Blue" means having bluish in color.
"Metaphysics" means the systematic study of metaphysical entities.

Rule 5: A Lexical Definition Should Not Be Negative When It Can Be Affirmative

Of the following two definitions, the first is affirmative, the second negative:

"Concord" means harmony.
"Concord" means the absence of discord.

Some words, however, are intrinsically negative. For them, a negative definition is quite appropriate. Examples:

"Bald" means lacking hair.
"Darkness" means the absence of light.

More examples:

A "mineral" is a substance that is not an animal and not a vegetable.
"Right" means not wrong.

Rule 6: A Lexical Definition Should Avoid Figurative, Obscure, Vague, or Ambiguous Language

A definition is **figurative** if it involves **metaphors** or tends to **paint a picture** instead of exposing the essential meaning of a term. Examples:

"Architecture" means frozen music.
"Camel" means a ship of the desert.

A definition is **obscure** if its meaning is **hidden as a result of defective or inappropriate language**. One source of obscurity is overly technical language. Compare these two definitions:

"Bunny" means a mammalian of the family Lepordiae of the order Lagamorpha whose young are born furless and blind.
"Bunny" means a rabbit.(Correct definition)
Animal: a living creature corporeal, distinct, on the one side, from pure spirit, on the other, from pure matter.

The problem lies not with technical language as such but with *needlessly* technical language. Because "bunny" is very much a nontechnical term, no technical definition is needed. On the other hand, some words are intrinsically technical, and for them only a technical definition will suffice. Example:

"Neutrino" means a quasi-massless lepton obeying Fermi-Dirac statistics and having one-half quantum unit of spin.

A definition is **vague** if it **lacks precision** or if its meaning is blurred—that is, if there is no way of telling exactly what class of things the definiens refers to. Example:

"Democracy" means a kind of government where the people are in control.
"Normal" means an attribute possessed by people who are able to get on in the world.

The first definition fails to identify the people who are in control, how they exercise their control, and what they are in control of.

A definition is **ambiguous** if it lends itself to **more than one distinct interpretation**. Example:

"Triangle" means a figure composed of three straight lines in which all the angles are equal to two right angles.
"Faith" means true belifs.

Does first definition mean that each angle separately is equal to two right angles or that the an-gles taken together are equal to two right angles? Either interpretation is possible given the ambiguous meaning of "all the angles are equal to two right angles."

Rule 7: A Lexical Definition Should Avoid Affective Terminology
Affective terminology is any kind of **word usage** that **plays on the emotions of the reader or listener**. It includes sarcastic and facetious language and any other kind of language that could influence attitudes. Examples:

"Communism" means that "brilliant" invention of Karl Marx and other foolish political visionaries in which the national wealth is supposed to be held in common by the people.
"Theism" means belief in that great Santa Claus in the sky.
"Feminism" is a militant movement originated by a group of deviant women for the purpose of undermining the natural distinction between the sexes.

The second example also violates Rule 6 because it contains a metaphor.

Rule 8: A Lexical Definition Should Indicate the Context to Which the Definiens Pertains
This rule applies to any definition in which the **context of the definiens is important to the meaning of the definiendum.** For example, the definition "'Deuce' means a tie in points toward a game or in games toward a set" is practically meaningless without any reference to tennis. Whenever the definiendum is a word that means different things in different contexts, a reference to the context is important. Examples:

"Strike" means (in baseball) a pitch at which a batter swings and misses.
"Strike" means (in bowling) the act of knocking down all the pins with the first ball of a frame.
"Strike" means (in fishing) a pull on a line made by a fish in taking the bait.

It is not always necessary to make *explicit* reference to the context, but at least the phraseology of the definiens should indicate the context.