

# The Effect of Human Experience on Formal Word Meaning

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## Abstract

We formally introduce experience and memory as a component of dictionary meaning. The current approach to word meaning focuses on computer applicability. Currently, meaning is determined by lexicon lookup and verification of attributes. We use the adjective *big* to illustrate an experiential approach to meaning: An object, relative to a class, is *big*, if the object's size is a right-outlier of the distribution of sizes of items of the class. The distribution of sizes of the class items depends in a fundamental way on memory and experience. Some advantages of this experiential approach to meaning are parsimony - one definition accounts for all uses of *big* - and an account of ambiguity in language.

**Goals.** The goal of this paper is to formally introduce human experience as an intrinsic component of word meaning. Current formal approaches to both grammar and dictionary meaning are developed with a focus on computer applications. This current focus, for reasons explained below, discourages consideration of experience as a significant component of the formal structure of language. The formal introduction of experience as part of language structure enhances appreciation of language as actually spoken by people. In the long run this approach will also assist in computer applications

**Adjectives.** For purposes of specificity we restrict our discussions to adjectives. Vendler [2] introduced a three-fold classification of adjectives - *intersective*, *modal* and *subsective* - which has gained wide acceptance [1]. Although alternative classifications exist [1], in this paper we focus on *subsective* adjectives for which the basic three-fold classification suffices.

Intersective adjectives are perhaps the easiest to understand. An adjective is *intersective* if its modification of a noun can be modeled as the set-theoretic intersection of the referents of the adjective and noun. For example a *wood chair* is an object that is both wooden and a chair. That is, the wood chair is a (set theoretic) member of both the class of all chairs and the class of all wooden objects. Consequently, the wood chair, lies in the intersection of these two classes and hence the name, intersective adjective. Common examples of intersective adjectives are color, - *blue*, *green*, *red* - substance, - *gold*, *wood*, *clay* - nationality, - *American*, *French*, - shape - *circular*, *rectangular* - etc.

Very roughly, an adjective is classified as privative or modal if it, or the noun it modifies, is not an attribute of the referent of the adjective-noun pair. For example a *toy gun* is not a *gun*, a *former president* is not a *president*, a *criminal lawyer* is not a *criminal*, a *counterfeit dollar* is not a *dollar*, etc.

An adjective is subsective if its meaning depends on context. Simple examples of subsective adjectives are the words *tall* and *short*. The numerical criteria for classifying a building as say, *tall*, are different than the numerical criteria for classifying a person as *tall*. Thus an eight foot person is considered *tall* while an eight foot building is considered *small*. Notice by contrast, that the meaning of intersective adjectives is not dependent on context. The criteria for recognizing a chair as wooden are the same criteria used to recognize a fence as wooden. Typical *subsective* adjectives are *tall*, *short*, *big*, *small*, *hot*, *cold*, *good*, *bad*, *skillful*, *recent*, *typical*, etc.

**Experiential vs. Non-experiential definitions.** The major innovation of this paper is the distinction between *experiential* and *non-experiential* definitions. An *experiential* definition is a definition that intrinsically requires a large body of memories, that is, observations from one's past. A *non-experiential* definition is a definition that depends on at most a bounded set of memories and past observations.

Non-experiential definitions are easily illustrated using colors. For example, an object is (*monochromatic*) *blue* if its reflection of white light is restricted to certain wavelengths. A person recognizes an object as (*monochromatic*) *blue* if the blue cones, but not the red and green cones, in his retina are aroused by a white light reflecting off the object. An especially nice feature of non-experiential definitions is their potential applicability to computers. If devices like the cone cells of the retina could be developed and linked to machines then machines would be able to recognize (monochromatic) blueness.

Experiential definitions can be illustrated using the subjective adjective, *big*. The current approach to understanding the lexicon entry of *big* is in terms of a dictionary table with separate criteria for each class of objects. For example *big* for humans might mean taller than 6.5 feet while *big* for buildings might mean bigger than 100 feet. This approach is *non-experiential* - that is, the person (or machine) makes measurements of objects but does not access a bank of memories / experiences.

We now outline the operational details of using an *experiential* approach to definition. We illustrate using *big*: At some stage in life (say, as an infant) a person becomes aware of the concept of *size*. *Size* itself is a non-experiential concept. We next assume, and this is the basis of an experiential approach, that the person (or infant) *plays* with the newly learned concept of *size*. The infant (perhaps unconsciously) continually estimates sizes of all objects it sees. These unconscious observations form the memory, or experience, of the infant. After a critical mass of memory / experience is achieved the infant or child (again, unconsciously) performs a crude statistical analysis. We assume that the child has (unconscious) criteria for recognizing right and left *outliers*. For purposes of discussing meaning, we need not concern ourselves with the details of the definition of outlier.

We teach the child that an object, relative to a class, is *big*, if its size is a right-outlier relative to the distribution of sizes of items of that class. The child can now correctly apply the word *big* in a variety of situations including new classes of objects which the child had not encountered prior to learning the meaning of *big*.

**Pros and Cons.** This experiential approach to meaning achieves parsimony. Instead of defining e.g., *big*, by a criteria table, we use one statistical definition. Furthermore, the definition accounts, allows and encourages the ambiguity for which language is known. The definition also allows the possibility that certain speakers are considered more mature (more memories) with a better grasp (more experience) of concepts. The biggest con to the experiential approach is the difficulty in transferring the approach to computers. Computer usage takes time. Computers are not built to *play and experience* the environment. Furthermore, the ambiguity of the resulting definitions prohibits their widespread use. The applicability of standards would depend on a computer's memory! However, we believe that this experiential approach correctly models and allows appreciation of language as it is spoken and provides valuable insights.

## References

[1] P. Ivonne P. and P. Wim, *The Treatment of Adjectives in SIMPLE: Theoretical Observations*, in The Second International Conference on Language Resources and Evaluation, LREC2000 (Session wO17 (Paper 366)), Athens, Greece: 2000.

[2] Z. Vendler, *Adjectives and nominalizations*, The Hague: Mouton, 1968.