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 privatative 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
