

## Experimental Semantics: The Lexical Definitions of "Prejudice" and "Alcoholic"

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Experimental semantics is a behavioral approach to linguistic meaning. The lexical meaning of a word is sought by experimentally investigating the relationships between the word and antecedent stimulus conditions. The relevance of experimental semantics to science is briefly examined. Experiments are reported which investigated the lexical meanings of two psychological terms, "prejudice" and "alcoholic." The following conditions were found related to the occurrence of "prejudice": (1) the epistemic status of the statement, and (2) the nature of the relationship between the typically empowered and unempowered groups mentioned in the statement. The following conditions were found related to the occurrence of "alcoholic": (1) a pattern of pathological alcohol use, (2) impairment in social or occupational functioning due to alcohol use, (3) tolerance to alcohol, and (4) withdrawal. It is concluded that the degree of systematicity of language and the particular relations between linguistic units and antecedent stimulus conditions can be assessed using this experimental approach to semantics.

Linguistic meaning—as in, "What does 'intelligence' mean?" has been a central concern in 20th century philosophy and science. There are several reasons for this. First and perhaps foremost, there has been a justifiable emphasis upon the simple notion that before we can determine whether a sentence is true or false, we must first know what the sentence means, if anything. For example, Russell (1905), in what has become a paradigm of analytic philosophy, demonstrated that the difficulty of determining whether the present king of France is bald, did not involve an empirical, tonsorial problem, but rather a semantic problem that could be resolved by formal, logical explication of the meaning of phrases containing definite descriptions. More radically, the logical positivists argued that many claims in ethics, religion

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and even psychology were neither true nor false, because such utterances (e.g., "The mind is tripartite") were, according to their verification criterion of meaning, devoid of cognitive meaning. Finally, ordinary language philosophers such as Ryle (1957) and Austin (1961) maintained that many philosophical questions were brought about by a failure on the part of philosophers to understand the workings of the natural language they were using. It was thought that these philosophers were entangled in pseudoproblems as a result of their linguistic infidelity. Linguistic therapy—which often involved the study of the natural use of a key term so that the ordinary, natural use could be understood and restored—was thought to be the cure for "the bewitchment of the intelligence by language" to use Wittgenstein's colorful phrase. These philosophers also thought that these linguistic studies would point to genuine problems and serve as a method for their resolution.

Thus philosophy in the 20th century took a "linguistic turn." Philosophical method often involved an attempt to explicate, analyze and clarify the semantics or syntactics of key linguistic entities. Ayer (1984) succinctly captures this development:

... it is true that many of the traditional problems of philosophy have revealed themselves as being closely connected with questions of language: the problem of self-identity, for example, with the analysis of the use of proper names and other singular terms, the problem of universals with the explanation of the use of general terms, the problem of truth with an account of the assertion of indicative sentences. There is also the point that analyzing the use of words can be a way of revealing the nature of what the words designate.  
(p. 18)

Another possible reason for the concern regarding linguistic meaning was the recognition that this is an important philosophical question in its own right. Philosophers found the meaning of "meaning" to be neither obvious nor uncontroversial. Moreover, philosophers wanted to be explicit and clear regarding this issue because of its increasingly central role in their method.

A further reason for the concern with the question of linguistic meaning in the 20th century was the role of semantics in the sciences. Scientists have been concerned with semantics because the practice of science involves the use of linguistic entities, e.g., questions, beliefs, hypotheses, concepts, knowledge claims. Language is science's medium of exchange and its repository. And as such, the practice of science can involve semantic problems: What is  $x$  (intelligence, species, space)?; What is the relationship between this word and the nonverbal, physical world?; What is the relationship between this word (concept) and this other word (concept)?; Are discrepancies in results or theory due to another scientist's different understanding of the meaning of  $x$ ?

Ayer (1984) in the quote above points to the final reason to be discussed here for the interest in semantics on the part of philosophers and scientists.

An understanding of the meaning of a word can help to reveal the nature of what the word stands for. A clear understanding of the meaning of "intelligence," including on which occasions it would be proper to use this word, can perhaps reveal something of the nature of intelligence and be propaedeutic to the study of more particular empirical questions regarding intelligence.

Although philosophical method often aimed at an understanding of the meaning of some key linguistic entity, attempts within philosophy to develop a satisfactory approach to linguistic meaning encountered numerous difficulties. The logical positivists failed to provide a version of the verification criterion that was free of logical and philosophical difficulties (Ashby, 1967). They also failed to develop a satisfactory artificial language, and failed to fully appreciate the importance of ordinary language and hence lexical meaning, as both a proto-language and a meta-language to any such artificial language. Ordinary language philosophers such as Austin, on the other hand, relied on introspection. The use of this method is problematic as they sought to discover general facts about empirical matters without using an optimal method for achieving this end. A method in which the experimenter and object of study are more independent is preferable as it produces less bias, because the subject is less influenced by knowledge of the purposes of the investigation, etc. As Wittgenstein has said, at best introspection allows the investigator to discover a fact concerning his or her behavior, but not a general fact. Further, this method does not allow intersubjective verifiability, systematic sampling of the subject domain, and the ruling out of common threats to valid causal inference.

The approach to defining terms that will be developed and utilized in this investigation owes much to Skinner (1957), as well as to Mandler and Kessen (1962). Experimental semantics is a behavioral approach to linguistic meaning which views language as human behavior that can be analyzed experimentally to determine if and what relationships exist between the occurrence of various linguistic units and certain environmental events. It uses true experimental methods and actual language users to test hypotheses that attempt to provide lexical definitions of terms by giving general descriptions of the antecedent stimulus conditions found to be functionally related to the occurrence of these terms.

Skinner (1957) in his book, *Verbal Behavior*, attempted to develop a satisfactory natural science account of language. (To be sure, like behavioral approaches to other subjects areas, the behavioral approach to language is controversial. See Chomsky [1959] for a critique of Skinner's account, and see MacCorquodale [1970] for a rejoinder.) In Skinner's behavioral account, language is verbal behavior, and as such it is not something fundamentally different from nonverbal behavior. Accordingly, Skinner utilized the same general framework for studying verbal behavior as he did for studying nonver-

bal behavior (Skinner, 1938, 1953, 1974). His justification for approaching the study of verbal behavior from the perspective of behavioral science is as follows: "What happens when a man speaks or responds to speech is clearly a question about human behavior and hence a question to be answered with the concepts and techniques of psychology as an experimental science of behavior" (1957, p. 5). In essence, then, Skinner attempted to understand verbal behavior in terms of the subject's genetic endowment, past history, and current circumstances. Understanding is achieved to the extent that prediction of specific instances of verbal behavior is possible and to the extent that it is possible to control verbal behavior by the manipulation of the conditions of which it is a function (Skinner, 1957, p. 3).

The central question addressed by Skinner's approach is "What are the conditions relevant to the occurrence of verbal behavior? Or stated in a slightly different way, "What are the variables of which verbal behavior is a function?". Thus, the dependent variable in the functional analysis of verbal behavior is "(t)he probability that a verbal response of a given form will occur at a given time. . ." (Skinner, 1957, p. 28).

The independent variables of this functional analysis are sought primarily in the past and present environment of the individual. These controlling variables are essentially of two kinds—antecedent variables and consequent variables. The responses of other humans are of particular importance as consequent variables. Thus, Skinner considered verbal behavior to be social behavior, i.e., behavior whose reinforcement is usually mediated by another organism. Such mediated reinforcement has been shown to be effective in controlling verbal behavior (see for example Holz and Azrin, 1966). Furthermore, verbal behavior has been shown to be particularly dependent on conditioned reinforcement, especially generalized conditioned reinforcers, e.g., attention.

The occasions for the occurrences of verbal responses are thought to be controlled by antecedent stimuli. An important type of antecedent stimulus in the control of verbal behavior is the mere presence or absence of an audience: we rarely speak when no one is present. This further supports the notion stated above, namely that verbal behavior is social behavior. Moreover, the nature of the audience also affects the nature of the verbal response: we seldom use certain words, e.g., "operant" in the presence of a three year old. It is also important to note that like nonverbal behavior, verbal behavior is thought to be multiply determined. More specifically, the strength of a single verbal response may be, and usually is, a function of more than one variable; and a single variable usually affects more than one response (Skinner, 1957, p. 227). The effect of multiple variables is thought to be supplementary, i.e., roughly additive.

These antecedent controlling conditions are important because it is thought that this is where meaning lies.

Technically, meanings are to be found among the independent variables in a functional account, rather than as properties of the dependent variable. When someone says that he can see the meaning of a response, he means that he can infer some of the variables of which the response is usually a function. (Skinner, 1957, p. 14)

And further:

Meanings, contents, and references are to be found among the determiners, not among the properties of a response. The question "What is length?" would appear to be satisfactorily answered by listing the circumstances under which the response "length" is emitted or better, by giving some general description of such circumstances. . . . (Skinner, 1945, p. 270)

This claim—that providing the meaning of a word involves some general description of the circumstances under which a word is emitted—is the central notion underlying this research. And Skinner does not stand alone here. Witness Percy Bridgman (1959), the originator of operationalism:

I suppose that my command of the meaning of a word could be called complete if I could exhaustively enumerate the conditions which would lead me to use the word myself and could infer from the usage of the word by you in any particular situation what were the conditions which had dictated the use of the word by you. (p. 19)

And further:

Thus we can always say when pressed to say what truth or time or existence is, *that these are words which we use under such and such conditions.* (p. 32, italics added)

Thus, a lexical definition becomes a report of the results of an experimental analysis of the controlling stimulus conditions that are systematically related to the occurrence of the term being defined. That is, one can systematically vary antecedent stimulus conditions to determine which conditions increase the probability of the verbal response that one wishes defined. (Of course, one must regard certain stimulus conditions as trivial, e.g., "Say the word 'x'").

### Semantics and Science

Mandler and Kessen (1962) have provided a general framework for applying the Skinnerian approach to verbal behavior and meaning to the language of psychology. These authors note that the ordinary language and a specialized language such as a scientific language have much in common: the rules for the formation of sentences are the same; they both contain many of the same words; and of foremost importance, the two modes of discourse can both

be fruitfully studied as a function of the occasions of their occurrence. "The important language responses of all men are elicited by some antecedent conditions and the satisfactory understanding of any language requires the examination of these occasions" (Mandler and Kessen, 1962, p. 11). Thus, the language of the scientist must be viewed as human behavior; and as such, it is no different, either quantitatively or qualitatively, in its development and maintenance from other human verbal behavior.

What is more, the scientific language cannot be viewed as independent of the ordinary language. That is, the vernacular is usually the initial source of statements and generalizations in science. As Mandler and Kessen state, the ordinary language "does not magically disappear in the laboratory or in the library" (p. 9).

However, Mandler and Kessen see a scientific language as differing from the vernacular in that the former should be more precise and invariant. That is, a word in the scientific language is not to be ambiguous, i.e., it is not to have multiple significations; nor is it to be reified, i.e., it is not to be treated as if it invariably names something which exists "out there." They state:

It is not the task of the scientist to construct a new language without any ties to his vernacular vocabulary. Rather it is to reformulate common language structures to eliminate vague terms, to avoid reified concepts, and to reconstruct step by step on the basis of his common language a new language which avoids the problems and the difficulties presented by the vernacular. The common language is not only the prerequisite of, but in effect, the very basis on which scientific language is built. (p. 18)

A study of a term's vernacular meaning, when the term is also used by scientists, can be useful for the following reasons: the fact that scientists continue to use the same term might indicate that some or all of the controlling conditions operative in the ordinary language are operative in the scientific context. Thus, there is usually a proto-meaning provided by prior experience with the word in the ordinary language that serves to guide its use in other contexts. Second, science in an important sense serves the ordinary person. That is, science often addresses issues that have been initially raised and formulated in ordinary contexts, by ordinary people, using ordinary language. If science is to provide relevant answers then scientists must understand the ordinary meanings of their terms, both to understand the questions and to be able to give understandable answers. Finally, to the extent that a vernacular term has meaning a systematic relationship has been established, and that the term continues to survive must be regarded as significant, and possibly indicative of an important discrimination.

To recapitulate, the behavioral approach views language as behavior. The meaning of a term is given in the antecedent conditions which alter the probability of the term's occurrence. Therefore, one provides a lexical definition of a term by experimentally manipulating antecedent stimulus conditions to

determine conditions that are systematically related to the utterance of a particular term by members of a verbal community. A stipulative definition can be then used to achieve the desideratum of scientific languages of response consistency.

Two potential criticisms that may be leveled against this approach to the investigation of linguistic meaning are: (1) it is in some way artificial, and (2) it is unfalsifiable. Both of these criticisms are not valid. Laboratory experiments are admittedly artificial in the sense that they are devoid of some of the richness found in the natural environment, but this is the well known trade-off between the control afforded by the true experiment (in which "richness" might mean uncontrolled extraneous variables), and the naturalness of other types of research strategies. Many classic investigations in psychological research possessed poor ecological validity. For example, Skinner's original experiments contained rats or pigeons in strange boxes with unnatural manipulanda and food pellets, and with contingencies that may or may not be found in the natural environment. The control afforded by such "unnatural" experimental procedures was thought necessary in order to find order. Designs which are more natural should also be conducted but it is reasonable first to try to determine what order can be found in the conditions that are most suitable for finding regular relationships. Second, it is difficult to define what are "natural" conditions for the occurrence of verbal behavior. Verbal behavior "naturally" occurs in some unusual situations, e.g., forced choice tests.

The approach to the investigation offered here is falsifiable in two senses of that term. In the first, "hard" sense, this approach suggests that hypotheses are formed and tested regarding variables that may control the frequency of occurrence of a linguistic entity. These hypotheses are of course all falsifiable. This is in sharp contrast to virtually all other approaches to linguistic meaning in which claims concerning lexical meaning are never put to systematic empirical tests. Second, the general strategy for the investigation of linguistic meaning offered here is falsifiable in the "soft" sense of that term, in that as a proposal it should be rejected if it as an approach does not prove useful. Thus, if orderly relationships cannot be found, or if systematic relationships are found but these do not seem to illuminate the meaning of the linguistic units under investigation then the method offered here should be rejected. However, to date there has not been any empirical investigations which employ this approach to determine linguistic, lexical meaning. What follows are reports of investigations of the meanings of two psychological terms, "prejudice" and "alcoholic."

### **"Prejudice"**

The following stimulus dimensions were hypothesized as influencing the probability of the verbal response "prejudice": (1) the epistemic status of the

statement; (2) the nature of the relationship between the typically empowered and unempowered entities mentioned in the statement; and (3) the nature of the dimension upon which these entities are being evaluated. More specifically, for the purposes of this study the epistemic status of the statement can be construed to involve two nominal categories: (a) no explicit epistemic basis; (b) a justification by an appeal to science. It is hypothesized that the probability of a statement evoking the response "prejudice" is higher for (a) than for (b). The nature of the relationship between the typically empowered and unempowered groups mentioned in the statement involves three categories: (a) the statement declares no difference on the relevant attribute between the typically empowered group and the unempowered group; (b) the statement declares a difference on the attribute of interest in favor of the typically unempowered group; and (c) the statement declares a difference on the attribute in favor of the typically empowered group. It is hypothesized that the probability of the statement evoking the response "prejudice" is highest for (c). The nature of the dimension or attribute upon which these groups are compared is also hypothesized to influence the probability of the statement evoking the response "prejudice." The more value-laden the dimension for comparison the more likely the statement will evoke the response "prejudice." Finally the effects of these variables are hypothesized to be roughly supplementary, i.e., roughly additive. In order to assess possible interaction effects as well as these main effects a  $2 \times 3 \times 2$  factorial design will be used.

### "Alcoholic"

The second psychological term to be defined by the proposed method of lexical definition will be "alcoholic." The DSM-III (APA, 1980), the manual most mental health professionals use to make diagnoses, refers to alcoholism as "alcohol dependence" (p. 169). The diagnostic criteria for alcohol dependence are either (1) a pattern of pathological alcohol use or (2) impairment in social or occupational functioning due to alcohol use, *and* either (3) tolerance or (4) withdrawal.

This definition of alcoholism is not a report of common usage, but rather is a stipulation designed to prescribe a certain usage. However, it is, in all likelihood, a stipulative definition that is in some agreement with ordinary usage. This part of the study will investigate the extent to which these variables—which have been stipulated as normative influences upon professionals—influence the verbal behavior of laypersons. The design will be a  $2 \times 2 \times 2 \times 2$  factorial.

Following the DSM-III, these stimulus dimensions are hypothesized as influencing the probability of the verbal response "alcoholic": (1) pattern of pathological use, (2) impairment of social or occupational functioning, (3) tolerance to alcohol, and (4) withdrawal symptoms. More specifically, for the



purposes of this study, the dimensions of a pattern of pathological use will be construed to involve two nominal categories: (a) no presence of a pattern of pathological use, or (b) the presence of a pattern of pathological use. It is hypothesized that the probability of evoking the response "alcoholic" is higher for (b) than for (a). The dimension of impairment of social or occupational functioning will be construed to involve two nominal categories: (a) no presence of an impairment of social or occupational functioning, or (b) the presence of an impairment of social or occupational functioning. It is hypothesized that the probability of evoking the response "alcoholic" is higher for (b) than for (a). The dimension of withdrawal symptoms will also be construed to involve two nominal categories: (a) no withdrawal symptoms, and (b) the presence of withdrawal symptoms. It is hypothesized that the probability of evoking the response "alcoholic" is higher for (b) than for (a). Although it is hypothesized that the factors considered in the DSM-III will actually influence the probability of the response "alcoholic," their role as sufficient and necessary definitional criteria in the DSM-III is hypothesized not to hold. Moreover it is hypothesized that the effects of these variables are supplementary.

### Method

*Subjects.* Three hundred and twenty subjects participated in this study. Data from 300 of these were used in the "prejudice" experiment; data from all were used in the "alcoholic" experiment. All subjects were volunteers whose cooperation was solicited in classrooms in Bloomington, Indiana. They were fully informed of their rights as research subjects. The subjects' responses were anonymous and were kept confidential. Only volunteers whose first language was English were used.

*Apparatus.* There were three sets of paper and pencil measures. The first paper and pencil measure asked the subjects to state their age, sex, race, and first language. This questionnaire was given to all subjects. The second set of questionnaires consisted of the actual verbal discriminative stimuli, in written form, hypothesized to affect the probability of the response "prejudice." Each of these questionnaires, which vary with experimental condition, contained a question asking subjects to describe these stimuli. In the "prejudice" experiment, the subjects were asked to complete this phrase, "These statements are examples of \_\_\_\_\_." The third set of questionnaires consisted of sets of the verbal discriminative stimuli, in written form, hypothesized as influencing the probability of the response "alcohol." The subjects were asked, "These statements indicate that Kelly is a(n) \_\_\_\_\_." Each subject received the stimuli appropriate to his/her experimental assignment, which was determined randomly.

In each of the twelve questionnaires concerning "prejudice" the subject was presented with five sentences. Each sentence mentioned two groups and compared these two groups on some dimension. The groups mentioned in the sentences: males and females, whites and blacks, Protestants and Catholics, Christians and Jews, whites and chicanos—were chosen because they depict major instances in which one group (the one mentioned first above) is commonly taken to be empowered relative to its outgroup (the one mentioned second above). However, the sentences varied from questionnaire to questionnaire in the following ways. First, sentences either had no explicit epistemic justification, i.e., nothing is said about how the claim contained in the sentence is supported, or the sentence made an explicit appeal to science as its epistemic justification, e.g., "Research indicates . . ." Second, the nature of the comparison of the pairs or groups mentioned above was either: (a) the sentence declared no difference on the relevant dimension between the typically empowered group and the unempowered group, e.g., "Blacks and whites are equally . . ."; (b) the statement declared a difference on the dimension such that the empowered group had a greater quantity, e.g., "Whites are more . . . than blacks"; or (c) the sentence declared a difference on the dimension such that the unempowered group had a greater quantity, e.g., "Blacks are more . . . than whites." Third, the dimensions comparing the pairs of groups were either socially desirable: intelligence, honesty, charitability, ability to work hard, or politeness; or more value neutral: preference for the taste of water, concern about the weather, depth of sleep, preference for the color blue, or enjoyment of birthdays. The designation of each of these dimensions as socially desirable or value neutral was presumed to be face valid.

In each of the sixteen questionnaires concerning "alcoholic" the subject was presented with four sentences. Each sentence mentioned whether or not a person, named Kelly (chosen for gender ambiguity), had or did not have a certain characteristic (e.g., tolerance). The dimension of a pattern of pathological use was operationalized by using the first criterion given for it in the DSM-III: namely, "needs alcohol daily in order to function well." The dimension of impairment of social or occupational functioning was operationalized by using a criterion given for it in the DSM-III, namely, "absent from work and has been in arguments with family members due to alcohol use." The dimension of tolerance of alcohol was also operationalized by using a DSM-III criterion, namely, "needs more and more alcohol to achieve the same effect." Finally, the dimension of withdrawal symptoms was operationalized by using the DSM-III criterion, "gets the 'shakes' in the morning but feels better after drinking more alcohol."

*Procedure.* Random assignment of subjects to experimental conditions occurred prior to the actual experiment. There were 25 subjects in each cell in the first study, and 20 subjects in each cell in the investigation of "alcoholic."

(The smaller number in the second study was due to the greater number of cells in this study.)

All subjects were given a questionnaire package. In the package, the subjects first were asked to complete the questionnaire designed to gather basic demographic information. Second, one-half of the subjects were asked to first complete a questionnaire concerning "prejudice," then complete a questionnaire concerning "alcoholic." The other half of the subjects were first asked to answer the questions concerning "alcoholic" and then to answer the questions concerning "prejudice." All subjects were then debriefed and any additional questions were answered.

## Results

Seventeen completed questionnaires in the main experiment were not used because either the subjects' first language was not English ( $N = 12$ ), or because they were improperly completed ( $N = 5$ ). Seventeen new subjects were found and these were run as replacements.

### "Prejudice" Experiment

The observed frequencies of the occurrence are given in Table 1.

Unjustified statements evoked "prejudice" significantly more frequently than did justified statements, chi-square (1) = 8.49,  $p < .005$ . Statements which declared a difference in favor of the typically empowered group evoked "prejudice" with a significantly greater frequency than statements which did not, chi-square (1) = 4.81,  $p < .05$ . Statements which contained a comparison on a socially valued dimension did not evoke the response "prejudice" more than statements which contained a comparison on a more value neutral dimension, chi-square (1) = 1.28,  $p > .05$ .

Table 1  
Frequency Data: "Prejudice" Experiment

Valued	Empow	Just	Nonprej	Prej
Val	Emp	Nojust	16	9
		Just	24	1
	Noemp	Nojust	42	8
		Just	48	2
Nonval	Emp	Nojust	22	3
		Just	23	2
	Noemp	Nojust	45	5
		Just	46	4

Table 2  
Frequency Data: "Alcoholic" Experiment

Wdraw	Toler	Impair	Path	Nonalc	Alc
Wdraw	Toler	Imp	Path	1	19
			Nonpath	3	17
	Notol	Noimp	Path	1	19
			Nonpath	7	13
			Path	3	17
			Nonpath	6	14
			Path	6	14
Nowdraw	Toler	Imp	Path	13	7
			Nonpath	3	17
			Nonpath	5	15
	Notoler	Noimp	Path	2	18
			Nonpath	13	7
			Path	2	18
			Nonpath	11	9
		Noimp	Path	6	14
			Nonpath	16	4

No second order or third order interactions were statistically significant. The gamma coefficient which is a measure of the degree to which included additional variables decreases error in predicting the dependent variable was .39.

#### "Alcoholic" Experiment

*Demographic characteristics.* The observed frequencies are given in Table 2.

The presence of pathological use did evoke the response "alcoholic" significantly greater than the absence of this factor, chi-square (1) = 36.7,  $p < .0001$ . The presence of an impairment of functioning did evoke "alcoholic" significantly more frequently than did the absence of this factor, chi-square (1) = 13.23,  $p < .0005$ . The presence of a tolerance evoked "alcoholic" significantly greater than the absence of this factor, chi-square (1) = 11.5,  $p < .001$ . The presence of withdrawal symptoms did evoke "alcoholic" significantly greater than the absence of this factor, chi-square (1) = 4.76,  $p < .05$ .

No second, third, or fourth order interactions were statistically significant. The gamma coefficient was .66. The absence of any one condition did not result in a frequency of zero. Thus, no conditions either singly or jointly functioned as necessary conditions. Moreover since no frequencies approached 100% no sufficient conditions were identified.

### Discussion

The results suggest that systematic relationships exist between certain stimulus conditions and the verbal response "prejudice." One can use these

relationships to explain and predict the occurrence of this verbal response. As predicted the questionnaire which contained all the factors hypothesized to influence the frequency of "prejudice" had the highest frequency of evoking the expected response. However, this frequency was 36%, which means that other factors need to be hypothesized and tested as the present account is not complete. Still this result is not insignificant. It is reasonable to assume that subjects initially entering the experiment had a near zero probability of saying "prejudice" but with the presentation of these stimulus conditions 36% responded thusly.

An additional complication concerns the idea of subjects giving compatible but less informative responses. An example of this is the word "generalization." This is a "correct" response since the sentences were in fact generalizations—however, and more specifically, they were a particular subtype of generalization. Perhaps, if more of the variables related to the occurrence of "prejudice" were provided this problem might be surmounted. This is essentially a question of discovering the discriminative stimuli that control a finer discrimination.

In the second experiment the hypotheses that the presence of a pathological use, an impairment in social or occupational functioning, a tolerance to alcohol, and withdrawal symptoms would each evoke "alcoholic" with a greater frequency than the absence of these factors were all corroborated. As hypothesized none of these factors was found to be analogous to a necessary definitional condition since the absence of any one did not result in a zero frequency. Lexical use did not seem to be the same as prescribed use in DSM-III since the absence of the permissible conditions still evoked (with high frequencies) the verbal response "alcoholic." Finally, the effects of these variables were supplementary.

This study shows that the factors prescribed in the DSM-III to influence the use of "alcoholic" by mental health professionals actually do influence the use of this word by the layperson. This occurs, however, not in the way prescribed in the DSM-III. No criterion or set of criteria functions as a necessary condition. Moreover, the nonprescribed combinations evoked a high frequency of the response "alcoholic." Thus, there seem to be discrepancies between the factors which actually control the use of this word by laypersons and factors which are prescribed to control its use by mental health professionals. This is strong preliminary evidence that communication might be problematic between these two groups. This is also strong preliminary evidence that communication within professional ranks might be problematic, if the ordinary language, as Mandler and Kessen (1962) state, "does not magically disappear in the laboratory or in the library" (p. 9). An interesting follow-up study would be to run the same study using mental health professionals as

subjects to see if their use of "alcoholic" follows the prescriptions of the DSM-III, or if it follows the ordinary use as indicated in this study.

One can also use single subject methodologies as low cost alternatives to the group methods used in this study to determine possible idiosyncratic factors which influence the occurrence of the response for a particular individual. One can assess for and understand semantic disputes using these single subject methodologies.

An attempt to increase the invariance of these responses can be made by explicitly specifying the antecedent stimulus conditions shown in the study to influence these responses as definitional criteria in stipulative definitions of these terms. This experimental approach to semantics provides an explication of factors which influence the use of the term which in turn provides a clarification of the term which may be preserved, if desired, in a stipulative definition.

In sum, linguistic meaning has been a central concern in both 20th century philosophy and science. Contemporary philosophical methods are competent to handle the formal and logical dimensions of language (e.g., Castaneda, 1982; Montague, 1960) but beyond being a potentially useful source for generating hypotheses, these methods have proven inadequate for addressing the empirical, contingent dimensions of language. Lexical linguistic meaning is by definition an empirical matter and therefore should be addressed by methods best suited for addressing empirical questions. The experimental analysis of antecedent environmental events that systematically evoke the use of a given linguistic entity, here stipulatively defined as "experimental semantics," places the question of lexical linguistic meaning in the domain of behavioral science. Experimental semantics insists that hypotheses concerning lexical meaning be validly tested by appropriate sampling of relevant language users and by using true experimental methods as this method provides the most relevant evidence concerning these empirical claims.

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