On Terms

Experimental

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In our everyday usage, the word *experimental* is both broad and innocuous: In general dictionaries it is said to mean things like tentative, provisional, tested empirically, or based on experience rather than on theory or authority. Throughout *Walden Two*, Skinner (1948/1962) made repeated use of the term to characterize his fictional society. Instead of relying on rules or practices established at the time of its inception, members of the community kept exploring new physical and social arrangements to see which ones worked most satisfactorily (a sequential comparison, but without a reversal of conditions). The community itself “was an experiment in living” (p. 22). “It’s a fact, not a theory. It has an experimental justification, not a rational one” (p. 161). Tea was served in tall glasses, for example, suspended in braided jackets, rather than in the conventional cups and saucers. A count of the number of spills indicated the superiority of the new system. “We encourage our people to view every habit and custom with an eye to possible improvement. A constantly experimental attitude toward everything—that’s all we need” (pp. 29–30).

Within psychology, the word has a complex history. Initially it was used to distinguish the newly established, empirical discipline from its more speculative antecedents within departments of philosophy (Benjamin, 2000; Boring, 1950; Fuchs, 2000; Sanford, 1894; Titchener, 1901–1905). The hall-

mark of the new discipline was a laboratory, mimicking those of the established sciences, in which physical instrumentation was applied to observers or subjects other than the experimenter, using standardized procedures. Later the word was retained to distinguish the original core of relatively abstract and general psychology from the more applied courses that were gradually being added to the curriculum. Ostensive definitions of this usage may be found in the contents of such classic texts as those by Boring (1929), Woodworth (1938), and Stevens (1951). Within the catalogue of courses, the word was used as a label for the offering on research methodology, often with laboratory exercises. When I was a graduate student at Columbia University, this term, like the term *scientific*, was thought to confer heightened status to the nouns by which it was followed. One of our courses was labeled Experiments in Abnormal Psychology, and one of the textbooks we used was entitled *Experimental Social Psychology* (Murphy, Murphy, & Newcomb, 1937). Nonetheless, it seems to have been the use of the term to distinguish the traditional academic, abstract, or general psychology from its more applied variants that led Division 25 of the American Psychological Association a few years ago to delete the word from its original title, Division of the Experimental Analysis of Behavior (Catania, 1997). Note also the use of Experimental Analysis of Behavior to designate a special interest group within the Association for Behavior Analysis, implying that the word *experimental* is a synonym for basic research.

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(Is it also implied that applied research does not use the experimental method?)

It was Skinner, however, who originally chose the phrase *experimental analysis of behavior* to describe his work. That phrase served as the subtitle of his first book (1938/1991) and the main title for the original conferences at Indiana and Columbia, the initial journal in the area, and Division 25. (It was only when a title was sought for a second journal, dealing specifically with applied problems, that the list of qualifiers became unduly cumbersome and one of them had to be dropped. The publisher of the two journals is still known as the Society for the Experimental Analysis of Behavior.)

It seems altogether unlikely that Skinner intended to ally his views with those of Boring, Woodworth, or Stevens. It seems far more plausible that he was emphasizing that his analysis was based on the use of the experimental method. The experimental method can be distinguished from other methods of gathering data in psychology, such as interviews, case histories, longitudinal studies, personality scales, attitude surveys, and the like. In essence, the experimental method is a method for isolating the relevant variables within a pattern of events. Methods that depend merely on observed correlations, without experimental intervention, are inherently ambiguous. The problem that muddies so much of medical research, to take a familiar example, is the widespread use of what are there called observational studies. People who happen to take exercise, a specific vitamin, or a given medication are compared with people who happen not to take that medication. All too often, these studies lead to erroneous conclusions. People who find it convenient and enjoyable to exercise may already be healthier than those who find it difficult or impossible to exercise. People who choose to take vitamins may pursue a more healthful lifestyle in general than those who do not

take vitamins. In the medical literature, observational studies are contrasted with clinical trials, in which subjects are randomly assigned to the different treatments. When feasible, these studies are considered much more authoritative.

Similarly, in psychology two measures of behavior may be found to covary at a statistically significant level, but it is not thereby made clear which factor is the cause and which is the effect, or indeed whether the relation between the two is not the product of a third, confounded factor, with which both of them happen to covary. Suppose, for example, it is found that students with good grades have more dates than those with lower grades. Does this imply that high grades make people socially attractive? That dating is the royal road to academic success? That it pays to be smart? Or that financial security and free time contribute both to academic and to social success? It is possible to control the situation to a certain extent by restricting the range of some of the more plausible variables, but there is no guarantee that the right ones will be chosen.

By contrast, when the experimental method is employed, it is possible to change one factor at a time (independent variable) while leaving all other aspects of the situation the same, and then to observe what effect this change has on the target behavior (dependent variable). Ideally, a functional relation may be obtained. Formal techniques of experimental control are designed to make sure that the conditions being compared are otherwise the same. Use of the experimental method serves as a necessary condition (*sine qua non*) to distinguish the experimental analysis of behavior from other methods of investigation. By now, a logical organization of our terminology may be a lost cause, but perhaps we can at least avoid additional confusion.

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