

## QUOTATION

### NEWELL AND SIMON ON STUDYING INDIVIDUAL ORGANISMS

It is a commonplace that behavior analysts and cognitive psychologists endorse significantly different positions on matters of research design and that their verbal repertoires ordinarily make very different kinds of contact with the data of psychological science. But in their pioneering volume, *Human Problem Solving*, Allen Newell and Herbert Simon (1972) offer the following observations regarding their rather unorthodox methodology for studying problem solving:

We never use grouped data to test the theory if we can help it. The models describe individuals, so that the hard part is to say with precision what is common to all human information processors. With this approach, it does not seem natural to assume that human behavior is fundamentally stochastic, its regularities showing up only with averaging. (p. 10)

There is no lack of orientation towards the data of human behavior in the theory presented in this book. Yet we employ little experimental design using control groups of the sort so familiar in psychology. Because of the strong history dependence of the phenomena under study, the focus on the individual, and the fact that much goes on within a single problem solving encounter, experiments of the classical sort are only rarely useful. ... It is difficult to test theories of history-dependent systems. ... Thus, this book makes very little use of the standard statistical apparatus. Theory and data are compared, and some attempts are made to measure and tabulate such comparisons. But our data analysis techniques resemble those of the biochemist or archaeologist more than those of the agricultural experimenter. (p. 13)

And, from a notably different source:

In the simple sense of involving large numbers of measurements very little of the preceding work is statistical. The psychologist who is accustomed to dealing with fifty or a hundred or a thousand organisms may be disturbed by groups limited to four or eight. But large numbers of cases are required, if they are required at all, in order to obtain smooth and reproducible curves. The recourse to statistics is not a privilege, it is a necessity arising from the nature of the data. Where a reasonable degree of smoothness and reproducibility can be obtained with a few cases or with single cases, there is little reason, aside from habit or affectation, to consider large numbers. There are always limitations of time and energy to be considered, and one must inevitably compromise between the depth and breadth of an investigation. Before advancing to new problems I have tried to secure a reasonable degree of reproducibility or reliability, but the investigation has not been pressed beyond that point. (Skinner, 1938, p. 442)

I never attacked a problem by constructing a Hypothesis. I never deduced Theorems or submitted them to Experimental Check. ... If I engaged in Experimental Design at all, it was simply to complete or extend some evidence of order already observed. (Skinner, 1956, p. 227)

---

#### From:

Newell, A., & Simon, H. A. (1972). *Human problem solving*. Englewood Cliffs, NJ: Prentice Hall.  
Skinner, B. F. (1938). *The behavior of organisms: An experimental analysis*. Englewood Cliffs, NJ: Prentice Hall.

Skinner, B. F. (1956). A case history in scientific method. *American Psychologist*, 11, 221-233.

Contributed by David L. Morgan, Department of Psychology, Spalding University, 851 South Fourth Street, Louisville, Kentucky 40203.