4

An Overview of Psychological Measurement

JUM C. NUNNALLY

1. Introduction

Because this book is being written for clinical psychologists, psychiatrists, and kin­
dred professionals, in this chapter it will be assumed that the reader is already famil­
liar with fundamental issues relating to behavioral measurement and, consequently,
that there will be no need to discuss low-level principles. Rather, the discussion will
center on controversial issues that are of immediate importance to the professional
clinician or researcher in the behavioral sciences. Whereas the examples chosen for
this chapter to illustrate principles of measurement are particularly applicable to
clinical diagnosis, the principles are quite general to empirical science. Because some
methods of statistical and mathematical analysis are intimately related to the de­
velopment and use of measurement methods, critical comments will be made about
some prominent approaches to statistical analysis, but details regarding their ap­
plications will be left to referenced sources rather than be discussed in detail here.
(Any reader who is not already familiar with fundamental principles of psychomet­
ric theory and analysis, or would like a refresher course in that regard, might want
to consult my book Psychometric Theory, 1978.)

I started writing about the generality of measurement problems in science and
the usefulness of related methods of mathematical analysis long before I had the
actual experience to substantiate the case, e.g., in my first book on psychological
measurement (1959). I sensed this generality of principles, and, more importantly,
I was told this was so by older and wiser hands who specialized in various aspects
of psychological measurement, e.g., in the lectures of the great L. L. Thurstone. As
I gradually became involved as a consultant or participant in some manner or
another in a wide variety of projects, I came to realize how genuinely true such state­
ments are regarding the generality of measurement methods and attendant methods of analysis. I have found similar principles to apply in an extremely wide variety of scientific issues in psychology, psychiatry, numerous fields of medicine, and law, and in special issues in the physical sciences and engineering, particularly biomedical engineering. Indeed, I have been surprised at the commonality of issues regarding psychological measurement that runs through these various disciplines. I have been even more surprised to find that some research issues regarding what I had thought of as "psychometrics" were more easily testable on physiological variables such as brain waves and pupillary response than on more conventional psychological measures such as achievement tests in arithmetic and personality inventories relating to adjustment.

1.1. Science and Clinical Art

A great deal of ink has been spilled and unkind words have been said regarding the requirements for psychometric methods in research as opposed to clinical practice. Amid unseemly snickers, basic researchers (primarily those who specialize in psychometrics) claim that many of the clinicians' would-be measures lack the refinements of standardization, with all the name implies, and that many of them are at the level of crystal-ball gazing and soothsaying psychologizing. With indignant response, the clinicians have claimed that many of the supposedly well-honed tools of the basic researchers concern only surface-layer trivia and fail to touch the deep richness of human psychological processes. When the partisan rudeness is wrung out of them, both points of view contain a germ of truth; and the outlooks on psychometric theory and analysis for basic science and clinical practice should be compatible.

The squabbles about measurement methods and indeed the inherent problems of measurement themselves relate to the fact that it simply is difficult to study people. The basic scientist is frequently frustrated by the inability to conduct experiments that produce interesting results, and the clinician is frequently frustrated by the intractability of patients to be understood or to lend themselves to successful treatment. Although psychological phenomena are the most intriguing with which any basic researchers or clinical practitioners deal (indeed, one finds this sentiment expressed by people in disciplines far removed from the behavioral sciences), working in the people-oriented disciplines requires tolerance of ambiguity and the ability to operate on low-percentage-of-reward schedules. The difficulties of finding adequate measurement methods for prominent theoretical constructs have had some adverse effects on at least some individuals in both basic science and applied work, or at least so it would seem from my own personal contacts and what is said in print. Some of the more hard-nosed, brass-instrument, basic researchers in psychology (some of the very best ones, so I would judge) have retreated into the study of extremely simple processes relating to memory, reaction time, and perception—as much or more because the phenomena are easily subjected to measurement and experimental control as because they are intrinsically interesting to the investigators or anyone else. In contrast, some of our clinical brethren, in despair of finding standardized measures of truly meaningful human attributes, have retreated into a holistic, existential jargon. In this heady atmosphere, one is not sure whether the goal is to develop clinical practice, a new religion that considers Zen Buddhism as