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COMPARISON OF VARIOUS TIME-SAMPLING OBSERVATIONAL
PROCEDURES UNDER VARYING BEHAVIORAL CONDITIONS

The University of Nebraska - Lincoln

Ph.D. 1984

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PREVIEW

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COMPARISON OF VARIOUS TIME-SAMPLING OBSERVATIONAL PROCEDURES
UNDER VARYING BEHAVIORAL CONDITIONS

by

M. Patricia Brockman

A DISSERTATION

Presented to the Faculty of
The Graduate College in the University of Nebraska
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For the Degree of Doctor of Philosophy

Major: Interdepartmental Area of Psychological and Cultural
Studies

Under the Supervision of
Associate Professor J. Michael Leibowitz

Lincoln, Nebraska

November, 1984

TITLE

Comparison of various Time-Sampling Observational Procedures

Under Varying Behavioral Conditions

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PREVIEW

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COMPARISON OF VARIOUS TIME-SAMPLING OBSERVATIONAL PROCEDURES
UNDER VARYING BEHAVIORAL CONDITIONS

Mary Patricia Brockman, Ph.D.

University of Nebraska, 1984

Adviser: J. Michael Leibowitz

Behavioral observation is an invaluable assessment strategy that is frequently employed in classrooms and other applied settings. To insure that data obtained via direct observation is appropriate and useful, various recording methods must be carefully compared and evaluated in terms of their accuracy. A great body of research already exists on issues related to the reliability of behavioral observation strategies; however, researchers in this area have focused on accuracy as an even more important consideration when evaluating observational assessment methods. In this study, several methods of observing behavior via time-sampling were compared to determine their relative accuracy in measuring behavior. These time-sampling procedures included momentary time-sampling, partial-interval observing and recording, whole-interval observing and recording, and a newly proposed modified interval sampling procedure (Powell, 1982). Computer simulations producing precise and varying conditions of behavior were generated to serve as an extensive data base for this study. The results of this study combined inferential statistics with a descriptive level of analysis to compare

the accuracy of the data produced by each of the four observational systems. These analyses and comparisons were made both overall and within the varying dimensions of frequency and duration. In general, the modified interval procedure produced the most consistently accurate data both when estimating behavioral frequency and duration.

PREVIEW

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Chapter I

Introduction

Because of the various purposes for conducting psychological evaluations, professionals need to be able to effectively utilize both traditional psychometric methods and behavioral assessment strategies. Basically, the function of psychological evaluations is to measure differences between individuals or between the responses of the same individual on different occasions (Anastasi, 1982, p. 3). The techniques produced by behavioral and psychometric evaluation methodologies enable psychologists to address a broad range of concerns and recommend useful solutions. To be able to select and employ appropriate assessment strategies, an individual must understand the basic assumptions, advantages, and limitations of both psychometric and behavioral evaluation instruments and procedures.

Traditional evaluation instruments include tests of general intelligence level, special aptitude and achievement tests, and personality measures such as emotional and motivational traits, interpersonal behavior, and other nonintellectual characteristics. Psychometric tests are constructed as objective and standardized measures of a sample of behavior for the purposes of diagnosis and prediction.

The diagnostic and predictive value of the instrument depends

on "the degree to which it serves as an indicator of a relatively broad and significant area of behavior" (Anastasi, 1968, p. 22). The test items selected for psychometric instruments may not even resemble the behavior the test is designed to predict, but are utilized as long as there is a demonstrated empirical correspondence between the two. The proper administration and interpretation of these instruments generally require highly trained examiners who usually perform all aspects of the testing themselves. Testing conditions are standardized to ensure uniformity in administering and scoring the instrument. An individual's score on a standardized psychometric test is only meaningful when interpreted in terms of the performance of the representative sample utilized in the development of the instrument.

Because of the need for objectivity and bias-free procedures in psychological assessment, psychologists and other professionals have expanded the base of evaluation methodologies to include behavioral assessment strategies. Standardized tests measure an individual's skills and abilities under conditions that sometimes bear little relevance to those of everyday life. Traditional assessment questionnaires measure what people report they do or believe, but not necessarily their actual behavior. Standardized tests and/or questionnaires are sometimes inadequate for answering questions about how people behave in unrestricted everyday situations, for determining whether they actually use their skills,

and for measuring how these skills are used as the individual proceeds through a typical day.

Behavioral assessment strategies can broaden the scope of evaluation and are an appropriate choice when gathering data pertinent to such issues. This is particularly true when it involves direct observation and recording of an individual's behavior in the setting where the referral problem has been noted. Naturalistic observations are considered not only as a supplemental source of information, but are often a preferred alternative in the evaluation of individual children and groups of children (Wasik & Loven, 1980). This data can also provide validity for substantiating conclusions drawn from standardized assessment data (Sackett, 1978c).

Direct observation is an appealing evaluation strategy for a number of reasons, but primarily because of the valid and compelling nature of the data collected. Systematic observational methods are often preferred because they help professionals meet the current demands for both program accountability and appropriate planning for individual children. These methods also provide a basis for the on-going evaluation of child performance over time, which can increase the likelihood that an effective intervention program will be developed. Such data permit direct assessment of behavior in the environment where it occurs and can objectively provide other important information such as teacher-child interaction, on-task behavior,

social-interaction skills, and peer comparisons.

Direct observation is the hallmark of behavioral assessment (Nelson & Hayes, 1981). Data can be collected using simple paper-and-pencil methods or more sophisticated automated measurement techniques. Mechanical or computerized equipment offer a potentially useful and sophisticated technology to the behavioral observation area. However, the hardware and software for observing and analyzing the behavior(s) of interest sometimes do not exist or, if available, are so complex or expensive that using simple paper-and-pencil methods is more practical and economical. Although computers are becoming more accessible for use as observational tools in applied settings, the expense of purchasing, programming, and maintaining this equipment is generally beyond the resources of school districts or others conducting behavioral assessment and treatment programs (A. C. Repp, personal communication, August 28, 1984).

Conducting observational assessments can be a time-consuming, complicated, and expensive task. However, when the purpose of the assessment requires complex behavior to be studied under the free response situations occurring in the everyday environment of the subject(s), direct observation may be the only method available for systematic, quantitative evaluation. Some psychologists bypass quantification and derive conclusions directly from personal observations and informal notes. While judgment and intuition clearly play

a role in deciding which among the many behaviors should be measured, certain verifiable facts about the behavior(s) will be determined only when accurate and reliable quantitative measurement has been made. Behavioral assessors are concerned with determining the following facts: a) whether a behavior occurs; b) whether it occurs repeatedly; c) whether it occurs in more than one setting; d) whether it can be measured in more than one way; and e) whether it is systematically related to the occurrence of other behavior(s) or events. A behavioral assessment device may be termed adequate to the extent that it has been previously shown to reflect these five important characteristics (Cone, 1981).

Description of Current Behavioral Observation Practices

Continuous Recording

When observing in environments such as schools, psychologists frequently make a running sequential recording of on-going behavior during a classroom visit. This continuous recording method involves noting each occurrence and duration of the behavior(s) throughout the observation session. However, recording behavior in this fashion for long periods of time can produce copious behavioral records that are both unwieldy to organize and difficult to analyze. The accuracy of this collected information is also questionable when the observational period is lengthy or when several behaviors occur frequently or simultaneously. It is with continuous recording that computerized methods offer the

most assistance.

Discontinuous Recording

Alternative observation and recording systems available to psychologists include various frequency, interval and time-sampling methods, such as momentary time-sampling, partial interval, and whole interval systems. These methods are all widely accepted systematic procedures often cited in the behavioral literature. Kelly (1977) surveyed the Journal of Applied Behavior Analysis and found that authors used one of the above forms of discontinuous time-based observation and recording procedures in 41% of the studies published there.

Momentary Time Sampling (MTS). This method also known as the instantaneous probe technique, requires an observer to note whether or not a specific response is occurring at the end of each observational interval (Hall, 1971; Kazdin, 1975). Repeated occurrences of the behavior within each interval are not recorded by the observer. Momentary time-sampling was used in 21% of the studies reviewed by Kelly (1977). The sum of MTS intervals scored during an observation divided by the total number of intervals in the session yields an estimate of the percentage of session time the subject engaged in the behavior.

Interval Time Sampling.

Partial and whole interval procedures are also commonly used in the applied literature.