A Case for Case Study Research

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The national and local health care debates regarding costs, efficacy, and regulation of services have challenged practitioners to demonstrate how their interventions help patients. Determining how noninvasive, process-based interventions help patients is a critical, but complex issue because success in rehabilitation is a culminating event representing the efforts of an entire health care team. Even more complex is the issue of how one conducts research because occupational therapy is integrated with other medical interventions. It is difficult, if not impossible, to link process-based interventions with patient performance using traditional, experimental research theories, designs, and methodologies. How then, may appropriate research be conducted?

Occupational therapists know that the process of occupation is highly individualized, producing countless variables that affect patient performance. Some of these variables are easily placed into research designs, and others, such as the verbal or casual variables practitioners use during treatment to alter a course of occupation, are not. This article argues that the case study research strategy (Yin, 1993, 1994) embraces a framework especially appropriate for studying the variables comprising occupational therapy process that lead to patient performance and outcomes. Although established qualitative procedures such as ethnography or grounded theory research are relevant for the study of process, the case study approach uses language, concepts, and structure that emulate the scientific method familiar throughout traditional medical and health care research.

The Case Study Research Method

Case study research is appropriate when a researcher is trying to "attribute causal relationships—and not just wanting to explore or describe a situation" (Yin, 1993, p. 31). The case study methodology also contains a procedure for integrating quantitative data related to treatment with nonnumerical data throughout an investigation. According to Yin (1993),

the major rationale for using this method is when your investigation must cover both a particular phenomenon and the context within which the phenomenon is occurring, either because: (a) the context is hypothesized to contain important explanatory variables about the phenomenon or (b) the boundaries between phenomenon and context are not clearly evident. (p. 31)

It is useful to distinguish the use of the term case in case study research approach from other uses in occupational therapy. As an academic teaching tool, the typical or unique case provides students with the opportunity for theoretical applications and potential outcomes. The term also has a variety of uses within the research context, including the one-shot case study, the single-case design, the single-system research approach, and the case study mode of reporting. Qualitative research traditions use the case study mode of reporting. In these examples, however, some of the tests of the case may be distorted to illustrate a particular teaching point or topic, and in other situations, the complete array of data may be unavailable. The case study research approach is conceptually different from these examples.

The current need for research on occupational therapy practice is similar to the past needs and experiences of business, education, and government service fields. During the 1970s and 1980s, practitioners were confronted with demands for service efficacy and proof of program outcomes. Methodologists in these fields reviewed research approaches that were advanced earlier in this century but then abandoned because of preferences for purely quantitative procedures based on statistical analyses. Recent methodological reviews are said to have expanded the traditional basic and applied research paradigms to include studies with the chief purpose of investigating program efficacy and impact (Merriam, 1988; Patton, 1990; Tesch, 1990; U.S. General Accounting Office, 1990; Yin, 1993, 1994).

Evaluation, action, and case study research are among the approaches that
may be considered within an expanded paradigm. They are especially relevant for the study of program- and practice-based issues and questions. Their extensive use in business, education, and government service fields has resulted in each approach’s continued maturation as established and respected research techniques. Donald T. Campbell, a methodology whose procedures are valued among medical researchers, endorsed case study methodology in the forward to Yin’s (1994) recent text on case study design:

It epitomizes a research method for attempting valid inferences from events outside the laboratory while at the same time retaining the goals of knowledge shared with laboratory science. (p. ix)

The remaining discussion shows how the case study approach may be applied to the typical proposal and reporting format used in medical research. The content following each heading is exclusively based on and interpreted from Yin’s (1993, 1994) original works in case study research.

Theory
Theoretically derived from both positivistic and postpositivistic philosophies, case study research provides a systematic format to unite data obtained through quantitative and qualitative procedures. Substantive theory from the practice field related to the phenomenon under investigation is incorporated into the case study. For example, an occupational therapist may select occupational behavioral theory to guide a research protocol or a proposal’s conceptual choices and decisions. Theory from the practitioner’s field is necessary to generalize findings to other cases.

Purpose and Research Questions
The initial research questions reflect the study’s purpose and subsequent decision to conduct an exploratory, descriptive, evaluative, or explanatory (causal) case study. Questions of how and why that focus on contemporary events are most relevant for selection of the case study research strategy.

Hypothesis
Derived from the study’s purpose, hypotheses are also called “theoretical propositions” in case study research. They provide a clear rationale, help direct an investigation, and may propose phenomenological interactions that predict cause and effect.

In experimental research, a null hypothesis suggests the absence of important relationships between or among variables. In contrast, case study research uses the concept of rival theories to recognize that, typically, more than one theory exists to explain how or why a set of variables are uniquely related under specified conditions. Rival theories or rival hypotheses are constructed to “explain the same outcome but with a different substantive theory than that of the target theory [hypothesis]” (Yin, 1993, p. 60). A rival hypothesis, therefore, should not be derived from the same theory as its counterpart. Rival hypotheses are the perspectives of the rival camps regarding the nature of phenomenological interaction (Yin, 1993).

Design
Depending on how the case is operationally defined, one of four designs is selected: (a) single-case, holistic; (b) single-case, embedded; (c) multiple-case, holistic; and (d) multiple-case, embedded. Single-case studies are appropriate for critical, extreme, unique, exploratory, and revelatory situations or for pilot testing of multiple-case study designs. The rationale for choosing a multiple-case study design is the same as that for multiple experiments: “...each case should serve a specific purpose within the overall scope of inquiry” (Yin, 1994, p. 45).

The study’s purpose also dictates whether a holistic or embedded case study design is used. For example, if the case is defined as a type of occupational therapy session that presents special challenges for patients, the session itself is a single case, and it is further identified as the main analytic level or primary unit of analysis (Yin, 1994). The design is considered holistic if all data and resulting inferences pertain only to the treatment session (the case). When additional data, such as a patient evaluation, are relevant to the study’s purpose and research questions, an embedded design is selected because although these data coexist, they are separate from the case itself. Thus, embedded data create additional, secondary levels for analysis that enhance the overall understanding of the case.

Method

Instrument
The case study protocol is the overall study instrument and system used to organize data at a designated level of analysis. For example, one analytic level may be formal occupational therapy measurement. Another level of analysis may be formal interview, and a study-specific interview guide is developed for questions targeting the phenomena of interest. Informal data (either written or verbal) may comprise yet another analytic level. The point is that the case study protocol is an instrument containing the infrastructure for collecting relevant data. These data are typically identified at the study’s outset but may be altered during the investigation. An instrument’s construct validity is further strengthened with multiple measures of the same construct at various analytic levels. An example of an occupational construct may be a performance component.

Data Collection
There are six primary sources from which to collect evidence—“documents, archival records, interviews, direct observation, participant observation, and physical artifacts” (Yin, 1994, p. 78)—and three specific principles outlined for data collection:

(a) multiple sources of evidence, that is, evidence from two or more sources, but converging on the same set of facts or findings; (b) a case study database, that is, a formal assembly of evidence distinct from the final case study report; and (c) a chain of evidence, that is, explicit links between the questions asked, the data collected, and the conclusions drawn. (Yin, 1994, p. 78)
These principles help address reliability and construct validity issues.

Subjects
Cases may be persons, or subjects, but they do not need to be. For example, a process or designated outcome of intervention can be a case. If two or more persons comprise a particular phenomenon or process, they may be considered as one case for purposes of stating the number of subjects. The boundaries assigned to each case determine the analytic level, which in turn specifies the context for data considered relevant. Data are collected at either holistic (only the case as defined is analyzed) or embedded (additional levels are deemed relevant for understanding) analytic levels.

Sample
Selection criteria are made through replication logic, a rationale similar to multiple experiments. Each case is selected “to produce similar results (literal replication), or contrasting results but for predictable reasons (theoretical replication)” (Yin, 1994, p. 46).

Procedure
Specific procedures for data collection are typically outlined in an appendix. The occupational therapy session where the particular process, behavior, or phenomenon of interest to the study may be described. The procedure shows exactly how data are collected within the study’s context.

Data Analysis
A variety of analytic techniques suggested by Miles and Huberman (1994) are recommended by Yin (1994) before conducting data analysis:

(a) putting information into different arrays; (b) making a matrix of categories and placing the evidence within such categories; (c) creating data displays—flow-charts and other devices—for examining the data; (d) tabulating the frequency of different events; (e) examining the complexity of such tabulations and their relationships by calculating second-order numbers such as means and variances; (f) putting information in chronological order or using some other temporal scheme. (p. 103)

Four dominant, but not exclusive, modes of data analysis are also recommended: (a) pattern matching; (b) explanation-building; (c) time-series analysis; and (d) program logic models, “a combination of pattern-matching and time-series analysis” (p. 118) used to detect repeated cause-and-effect interactions among variables. Program logic models are particularly valuable for exploratory and explanatory case studies.

Lesser modes of analysis are used in conjunction with dominant modes and include “(a) an analysis of the embedded units of analysis; (b) repeated observations; and (c) the case study survey approach” (Yin, 1994, p. 119). Each analytical mode has a corresponding, detailed procedure.

Validity
Explanatory (causal) case studies address internal validity through pattern analysis—comparing “an empirically-based pattern with a predicted one” (Yin, 1994, p. 106)—and through the use of rival hypotheses, explanation-building, and time-series analysis. External validity, including generalizability, is determined through replication logic when multiple-case studies are used.

Reliability
Strict adherence to the case study protocol, as well as careful development, management, and maintenance of the case study data base, will ensure that the study’s procedures can be replicated and produce the same results. A follow-up article will show how the case study approach can be used to investigate a practice intervention to determine occupational therapy’s contribution to the overall treatment outcome.

References