Choosing Research Methodologies Appropriate to Your Research Focus

ABSTRACT

This paper considers the generic activities involved in research and some issues that underlie whatever specific methodologies the investigator selects. A general definition of research (or empirical inquiry as it is generally termed in the paper), broad enough to encompass multiple research traditions and methodologies, is developed: systematic connection of observation of the empirical world with abstraction about the empirical world in ways that consciously seek to identify and control for bias and thus provide the most complete view that is relevant to the purposes and focus of the inquiry. Five activities necessary in the process of empirical inquiry are discussed: (a) finding a focus, (b) describing the problem to be investigated, (c) selecting the phenomena in the empirical world to observe, (d) observing the phenomena, and (e) analyzing and interpreting the observations. Each activity is described, major issues are considered, and, where appropriate, alternative approaches represented by deductive and inductive research traditions are presented.

INTRODUCTION

The task in this paper is to consider what the library practitioner who undertakes a research project needs to know about research methodologies. There are obviously a great many issues involved with choosing research methodologies and with carrying them out...
appropriately. Texts on research methodologies within the field of library and information science (e.g., Busha & Harter, 1980; Mellon, 1990) and numerous texts treating research in the social sciences in general (e.g., Miller, 1991; Kidder & Judd, 1986; Kerlinger, 1986; Dubin, 1978; Patton, 1990; Strauss, 1987) provide excellent descriptions of and instruction in various methods or traditions of empirical investigation. *(The Handbook of Research Design and Social Measurement* by Delbert Miller [1991] is a comprehensive handbook that provides an excellent starting place for a wide variety of research issues. The capsule descriptions of techniques are useful, and each description is accompanied by a short but generally very useful bibliography to carry you further into the topic.) An individual investigator must choose the methods of empirical inquiry that are best suited to his or her specific problem and purposes. The process of designing and implementing a good research project is, in essence, putting together and following a plan that consciously matches methodology with the particular characteristics of what the investigator wants to know.

The research guides cited above, and other books and articles from their bibliographies, will provide you with detailed discussions of procedures and techniques for using specific methodologies. This paper approaches the topic from a slightly different perspective by considering the generic activities involved in empirical inquiry and some issues that underlie whatever specific methodologies you select.

The term "research" means different things to different investigators, often connoting primarily the particular methodologies or research traditions that each uses. In this paper, I am following Paul Diesing’s usage of the phrase, research tradition, to refer loosely to research that shares assumptions, definitions of problems, and techniques or procedures for addressing them (Diesing, 1991). The notion that research processes can be grouped together based on a common set of assumptions and ideas of what constitute problems and how best to research them without bias is frequently discussed under the label "paradigm," loosely following Thomas Kuhn’s notion of a paradigm (Kuhn, 1970). Kuhn's revised concept of a paradigm, developed with reference to research in the sciences, refers to an exemplar or a specific procedure for solving problems. His usage seems more specific than the notion referred to here, and therefore I have preferred the term "research tradition." To sidestep the confusion of multiple definitions of what constitutes "research," this paper will generally prefer the phrase "empirical inquiry." A definition of this process will be developed now.

Kidder and Judd (1986) describe research as systematic observation conducted to support or modify theories and hypotheses about social behavior (p. 21). From this and similar definitions in other texts, three elements can be identified: (a) abstractions in various forms, including
words for phenomena and descriptions of relationships among phenomena; (b) observation, or the activity of observing phenomena in the empirical world; and (c) the systematic development of links between observation and abstraction, or between the observed phenomena and abstract accounts.

Kidder and Judd go on to contrast research as a way of knowing with ordinary knowing. In the ordinary way of knowing, people construct abstract explanations, called hypotheses by Kidder and Judd, about why the things that they see around them occur; in other words, the ordinary way of knowing involves connecting the phenomena in the empirical world with abstract ideas about the phenomena. Kidder and Judd suggest that the most important difference between ordinary knowing and research lies in the systematic search for biases in the research process (pp. 4-21).

Bias in empirical inquiry is a concept that can be interpreted numerous ways, often depending on one's research tradition, from being synonymous with error to referring to a particular slant, perspective, or point of view on a subject. Bias, in this paper, will be defined very broadly as a partial view or incomplete view. In the normal course of work life, librarians, like professionals in any setting, tend to develop knowledge about the settings around them in ways that resemble what Kidder and Judd describe as ordinary knowing. The papers in these proceedings address the use of empirical inquiry by library practitioners as a way of approaching their work—as a way of knowing. Extrapolating from Kidder and Judd above, an important part of making the transition from ordinary knowing to knowing through empirical inquiry is the systematic search for the biases in the process through which you come to conclusions.

In this paper, the process of empirical inquiry will be defined as the systematic connection of observation of the empirical world with abstraction about the empirical world in ways that consciously seek to identify and control for bias and thus provide the most complete view that is relevant to the purposes and focus of the inquiry.

**ACTIVITIES IN THE PROCESS OF EMPRICAL INQUIRY**

For the purposes of this discussion, the process of empirical inquiry will be divided into five activities: (a) finding a focus, (b) describing the problem to be investigated, (c) selecting the phenomena in the empirical world to observe, (d) observing the phenomena, and (e) analyzing and interpreting the observations. In research practice, these activities overlap and are recursive to a greater or lesser degree.
The identification of separate activities is in many ways artificial, but it serves the purpose of focusing attention on one aspect of the research process at a time.

**Finding a Focus**

Much empirical inquiry that library practitioners wish to undertake starts with a question or problem that arises in a specific library, frequently in the context of decisions to be made or action taken. Often investigators begin with some idea of their purpose in undertaking inquiry, as, for example, a project to determine the need for additional reference desk staffing to cope with increased demand for assistance related to CD-ROMs and the automated catalog. This first conception of the purpose for the inquiry often shapes the initial formulation of its focus.

The initial formulation of a problem often arises out of concrete circumstances, so it may be very specific. Alternatively, the first formulation may be quite broad. Whatever the level of specificity, the first formulation usually views the problem from a specific perspective. A perspective, used in this sense, is a set of ideas about what elements in the situation are important. A perspective, or way of looking at an issue, focuses attention on certain factors and precludes looking at other factors in a situation. In other words, the perspective in a sense "predefines" what phenomena or elements are worth looking at. Your initial perspective at the beginning of a project may well end up being the one you want to use; however, focusing your attention on specific elements before you have surveyed a broad range of factors runs the risk of ignoring other important and influential elements in a situation.

As a first step in finding your focus, then, it is useful to consider your field of interest broadly, from multiple perspectives. This process of attempting to look at problems from a variety of perspectives, and thus considering as many relevant factors in a situation as possible, has been described by Bolman and Deal (1991), in the context of making management decisions, as "reframing." To illustrate the process of reframing, or viewing a situation from multiple perspectives, let's look at a specific hypothetical situation. Suppose that, as the head of an academic reference department, you have observed that the introduction of six new CD-ROM stations over the past year has created a chaotic situation where the reference librarians cannot respond adequately to patron need. Librarians are complaining that they are spending too much time fixing machines and not enough time answering reference questions; support staff are being asked to help out and that is taking time away from their work and causing other frictions; and patrons
are complaining that they can’t get help, that the machines aren’t working and that often no one can fix them, and that not all the staff are friendly and helpful when problems occur.

You decide that, before taking action, you will undertake a process of empirical inquiry to understand more fully the situation you face. In terms of this paper, you decide to take systematic, preplanned steps to link observations of the world around you with abstractions that explain that world, in ways that will be subject to as little bias as possible.

Initially, you may see this problem as one of staff scheduling, providing more librarians at peak usage time; so the focus of inquiry might be on establishing patterns of demand. Alternatively, you might see the problem as one of job definition and perhaps specialization: who is supposed to be doing what jobs in relation to the computers. A focus here might be to establish what tasks are actually being performed, or are needed. Or perhaps you may focus on issues of appropriate levels of service, expectations of the users, or appropriate types of training and instruction. Another possible way of looking at the problem might concern the technophobia or technophoria of both staff and users. Or, perhaps you may consider it simply a budgetary problem: more reference librarians are needed, and the problem becomes how to demonstrate to resource allocators that more resources are needed.

Note that each one of these formulations focuses on certain elements and excludes others. Inquiry that was driven by each of these perspectives would collect data on certain aspects of the situation and not others.

"Reframing," or looking at situations in new ways, can be quite difficult. The more recalcitrant or chronic the problem—the more resistant it has been to previous analysis and solution—the more difficult, and the more important, it might be to consider alternative perspectives in an effort to generate more factors to consider.

What are some concrete ways to foster "reframing" in exploring a problem? One approach is to involve people who are affected in various ways by the problem to participate in the problem exploration, such as people with administrative responsibility, librarians, support staff members, student or other part-time workers, users, and administrators outside the library. Michael Patton (1982), in Practical Evaluation, discusses ways to involve all stakeholders in formulating the questions that will be asked. Not only will you get more heads working on the problem, but since different groups of stakeholders view problems differently, more perspectives, and more factors, may arise.

Reviewing the library literature, and especially the literature of other disciplines, can be a source of fresh perspectives. The literature can provide discussions from other perspectives, formal theoretical treatments of problems, and empirical studies. Identifying a theoretical treatment of a problem that seems to address the relevant issues is often
a useful way of providing a framework for inquiry. The same issues of perspective apply in evaluating whether a particular theory addresses all relevant issues that you feel you need to address. In the CD-ROM example, the literature on the introduction of new technology into the workplace may suggest interesting factors to consider in analyzing the problem. Different theories suggest different factors, however. As an example, theories differ in the extent to which they address gender issues in technology. Bolman and Deal (1991) suggest also becoming familiar with theoretical perspectives that are somewhat different from the entrenched ways of analyzing situations. Examples of less familiar perspectives are what Bolman and Deal define as the political perspective and the symbolic or cultural perspective. Perspectives that look at gender issues might also be considered in this category. (For an introduction to gender issues in research, try Feminist Methods in Social Research, by Shulamit Reinharz [1992].) Identifying colleagues who have had success in coping with similar problems or who are trying innovative solutions is another strategy for broadening perspectives.

It may be useful to think of the process of finding your focus as drawing boundaries that will specify the phenomena of interest to you and something about their relationships. The problem becomes one of finding the best balance for your purposes. Boundaries that are too widely drawn may result in more complexity than can be adequately studied. Boundaries that are too narrowly drawn may exclude complexity that is necessary to an adequate understanding of the situation. Any solution necessarily involves a compromise between what you would like to know and what you feel you can adequately investigate. You may find it useful to try to draw the boundaries as narrowly as you can and still retain the complexity that you feel is necessary to serve your purposes. Again, involving stakeholders in helping define these boundaries is one way of insuring that multiple perspectives relevant to the context of the issue in a real-life situation are included in your inquiry.

Once you are satisfied that you have identified as many perspectives, and as many potentially relevant factors as possible, you can begin to reconstruct your description of the problem.

Describing the Problem under Investigation

Once you have defined the focus for your inquiry, you are ready to move to a more specific description of the problem you will investigate. That description of the problem will be the framework that guides the rest of your activity. We will look at two issues involved in specifying
the framework: (a) the abstractions that you use to describe the elements of the framework, and (b) the specific form your description of the framework takes.

Your formulation of the framework for your inquiry will consist of abstract statements identifying phenomena and frequently some explicit or implied assertion of the relationships among phenomena. Examples relating to the CD-ROM example can show the wide range of possible abstract descriptions of phenomena: “activities relating to CD-ROM,” “professional reference librarians,” “library staff,” “clerical, technical, and professional tasks related to CD-ROMs,” “users’ requests for help with CD-ROMs,” “willingness to provide help,” “positive attitudes toward computers,” “willingness to instruct in search strategies,” “instruction in search strategies,” and “library users.”

Brinberg and McGrath (1985) make a distinction between phenomena or elements that arise from the substantive, or empirical, world and those that arise from the conceptual world. For example, abstractions such as “professional reference librarian,” “library staff,” and “library users” come from the substantive world of libraries. Elements such as “willingness to provide help” come from the conceptual domain and are often called constructs. Other examples of frequently used constructs are “job satisfaction” or “motivation.”

It is very useful to be able to define for yourself the meaning of the abstractions that appear in your problem description, particularly the more abstract constructs. These constructs may come from theories or the literature and may have a history of varied definitions, as does the construct of “job satisfaction.” The wording you choose for your abstractions and the meanings that the words have for you have important consequences for your inquiry because they drive the activities that follow.

Another issue involved in the description of the problem you are investigating involves the specificity of your formulation. Descriptions of problems can take a number of forms and can vary in the specificity with which they pin down the abstractions of interest and the relations among them. Several possible descriptive formulations include a narrative, a research question or a series of questions, and specific explanatory statements or hypotheses. The narrative is useful for pinning down the perspective or conceptual framework that you have settled on, even when you move on to develop research questions or specific hypotheses. If you are using formal theory to guide your inquiry, you may wish to write a concise description of your specific situation, using the abstractions and constructs of the theory. For example, if your investigation focused on the extent to which Shoshana Zuboff’s concept of “informating” was occurring in libraries, you would not only want
to define the concept of "informating" but also to describe informating in the context of your specific situation (Zuboff, 1988). That description serves as the framework for your investigation of informating.

It is also useful when developing the narrative to note the perspectives and phenomena that you have excluded in drawing your boundaries. These are issues that you will not be investigating directly. At the end of the project, when you are interpreting the results, you may find it helpful to reflect on what you did not study as a way of further illuminating what you did study.

How specific should your formulation of your framework for inquiry be? Will you be guided by a general research question, or will you develop specific hypotheses that will guide your observation of the empirical world? It may be helpful to think of formulations of focus on a continuum. At one end are very general abstractions that draw very loose boundaries around the phenomena and their relationships that you will look at. In the CD-ROM example, a research question that falls at the general end of the continuum might be the following: What activities do reference librarians perform in relation to CD-ROM? Note that the general nature of the abstraction "activities relating to CD-ROM" draws very loose boundaries within which observations will be conducted.

A slightly more focused question might specify types of activities: What clerical, technical, and professional tasks are performed by library staff members? In specifying types of activities, you have introduced more specific constructs. You will need to define these constructs carefully so that you are clear about what you mean by "clerical" or "professional" tasks. Note that the act of definition itself can often illuminate potential difficulties in your research framework. Suppose, for example, that you define "professional tasks" as those done by professional librarians. If the purpose of your research is to identify different types of tasks that reference librarians are performing, and one of your categories is defined as the tasks librarians perform, then you have involved yourself in circular reasoning and demonstrated the need for either a specific list of professional tasks or specific criteria—other than the performer—by which to assess which tasks are professional.

At the other end of the continuum are very specific abstract statements that draw very close boundaries by specifying relationships among abstractions. Your inquiry, then, is focused on seeking evidence to support or disconfirm the existence of these relationships. Examples of several specific hypotheses coming out of the CD-ROM problem might be the following: (a) professional reference librarians are performing clerical, technical, and professional tasks related to the CD-ROM
searching systems; (b) among professional reference librarians, knowledge related to computers is associated with willingness to provide whatever level of help with CD-ROM the user asks for; (c) among professional reference librarians, positive attitudes toward computers are associated with willingness to instruct users in search strategies.

Virtually every empirical investigation—regardless of the tradition or procedures—includes specific statements of relationships among abstractions based on some systematic observation of the empirical world. Research traditions vary, however, as to the stage in the process where these statements of relationship—which can be called hypotheses—come. One group of research traditions—which can be loosely termed the deductive traditions—creates the specific statements of relationships (the hypotheses) before entering the empirical world to observe. Observation of the empirical world is then structured to support or disconfirm specifically formulated relationships.

Another group of research traditions—which can be loosely labeled inductive traditions—develops statements about relationships from observation of the empirical world. The statements of relationships are developed and assessed in the process of observation rather than formulated in advance to guide investigation.

A number of considerations can help you decide whether deductive or inductive approaches are most useful for a specific inquiry. Consider whether you feel your present understanding of the topic is sufficiently complete that you will not be excluding factors of central interest by focusing only on certain relationships. Ask yourself, for example, if your abstract or theoretical narrative describes what you feel are the relevant elements and their relationships.

Consider, also, whether the set of specific relationships you are looking at can be meaningfully isolated from the larger context. Often combining deductive and inductive methodologies is a way to confirm or disconfirm specific relationships while also providing a broader context for interpreting the total situation. A last consideration involves whether or not you wish to make use of statistical methodologies to make inferences about a broader population based on the data from the sample under investigation. Deductive traditions have well-established procedures for extending your conclusions beyond the group from which you have collected data, and specific hypothesis formulation figures prominently in those procedures.

Selecting the Phenomena to Observe

The description of the problem to be investigated provides an abstract framework for your observations of the empirical world.
Empirical inquiry represents a systematic or structured linking of abstraction and observation, so it is necessary to specify the procedures or means by which you plan to look for your abstractions in the empirical world. This step—of connecting abstractions and statements of relationships among them to real-life exemplars—involves specifying what the abstractions mean in specific terms, including how you will recognize them in the real-life world.

The strength of the match between your abstractions and the empirical phenomena you choose to observe is the crux of good inquiry. To control bias, investigators must observe phenomena that represent as closely as possible the abstractions talked about in their problem statement. This concept—the close link between the abstract constructs and specific representations (including the way they are defined, identified, and observed) in the empirical world—is labeled as correspondence validity by Brinberg and McGrath (1985) in *Validity and the Research Process*, a comprehensive text that pulls together notions of validity from many different traditions in research. The term "construct validity" is often used in deductive traditions to refer to the idea of the fit between the abstraction or construct and what is being measured.

It is useful to talk about four potential weaknesses that can occur in linking abstract descriptions (of any specificity, from research question to specific hypothesis) with observations of the empirical world. These problems exist whether the link comes before observation or during it.

The first potential weakness is that the observations incorporate phenomena or relationships other than, or in addition to, those specified in the abstractions; in other words, the empirical phenomena are actually more complex than your abstract description of it recognizes. For example, people who hold MLS degrees in libraries frequently have management responsibilities or have different status in the organization from people who do not hold the library degree. The MLS degree thus measures people who are in the professional class of "librarians," but it also may be measuring people who have certain functional or status roles in the library. The potential implication for your inquiry is that the factors that are shaping the outcomes that interest you are not related to the MLS but are, in fact, related to functional or status roles.

Another weakness is that what you plan to observe is more simple or encompasses less than the ideas in your abstract framework. In this case, the empirical data may miss important elements of the situation that are implied by your abstractions, either because your observations were too restricted or because they did not tap the essence of the problem you were studying. Suppose that you are studying reference transactions, and you decide that you are interested in the use of a certain body of abstract reference knowledge to solve certain kinds of problems. This
Choosing Research Methodologies

statement of your construct of interest implies a definition of "professional librarian" as one who knows and uses certain abstract knowledge. If you choose to represent this construct in your inquiry by individuals holding MLS degrees and working in reference departments, you may not be zeroing in as specifically as possible on the essence of your construct—use of abstract knowledge. Measurement by the MLS may exclude those who have the appropriate abstract knowledge but do not have the degree, and it may lump together widely varying types or levels of abstract knowledge acquired during an MLS but say nothing specifically about reference knowledge. In other words, the MLS may not be a sufficiently precise indicator of the abstraction that really interests you—abstract reference knowledge.

The third potential weakness is that the phenomena being observed change, perhaps systematically, as a result of conditions that the investigator does not take into account; in other words, the phenomena being observed are not stable across time and situations. Another way of thinking about this problem is that there may be changes in conditions affecting what you are observing that are not apparent to you but that affect what you observe. Consider, for example, a situation where you specify that you will observe instances of the abstract concept of "reference librarian" by identifying persons with an MLS who are scheduled on the reference desk. Suppose also that the week you chose to observe MLS-degreed staff who were scheduled on the reference desk was also the week of a national conference on bibliographic instruction, and so librarians from other parts of the library were filling in for the regular reference librarians. Or suppose that during the semester you conduct your inquiry, several reference librarians are on leave, or new staff without experience are being trained. This example, although somewhat simplistic, illustrates differences in phenomena that you have not controlled and that may result in measuring unequivalent phenomena and not recognizing it.

A special case of the problem of observation of variables occurs in relation to the knowledge and attitudes of humans. Can we assume that an individual holds a set of unitary, unconflicted, and stable ideas in relation to complex subjects? Might the circumstances in which questions are asked and answered call up different aspects of complex patterns of belief? How do we deal with the possibility that humans will forget or fail to recognize the relevance of an idea, opinion, or attitude to a question? To what extent are the ideas, attitudes, and knowledge that an individual articulates produced as a result of the combination of factors at the time the question was asked? Do people act based on consciously articulated rationales, or do they construct them afterwards? To put some of these considerations in a concrete context: If a librarian is asked on multiple occasions to articulate his
or her views about the appropriate balance between teaching patrons how to use complex reference sources and actually consulting the sources for the patron, will these views be the same, or reasonably so? These are complex issues, and are raised here merely to introduce the problem of consistency of human response.

A last potential weakness is that the "instruments" or "tools" that gather the data introduce variation that will produce observations that are not stable across time and situations. These instruments can be human or nonhuman. When we ask respondents to give us facts, we are, in essence, using them as measurement instruments. For example, if we ask a library director to provide us with the characteristics of a library staff, we are using her as an instrument to measure the staff. Many factors, including mental definitions used, time and care taken in gathering data, extent of verification, concentration, and motivation may cause the description of the same phenomena to vary. Anyone who has worked with library statistics will probably testify to the difficulty of providing the same measurements in the same way over time, even when definitions are provided.

The correspondences between observation and abstraction are never complete. Investigators are constantly in the position of having to act as if there were correspondence where, in fact, it is only partial. This behavior is frequently called making simplifying assumptions. It is an inevitable part of inquiry, but it is also an inevitable source of bias, and the investigator must take the responsibility for assessing the effect of these assumptions on the results and minimizing it as much as possible.

The deductive and the inductive approaches were introduced earlier in connection with the stage at which hypotheses are created. These two approaches provide useful ways of looking at alternative strategies for linking abstractions and observations.

Deductive research traditions involve the progressive narrowing of focus from theoretical formulations specifying constructs and their relationships to specific units or entities representing the abstractions—and often called variables—that will be measured. This narrowing process is frequently called "operationalizing." It is founded on the assumption of operationalism, which takes as a given that constructs can be observed and measured. Kidder and Judd (1986, pp. 18, 40-41) provide useful definitions and discussion of this process, moving from the abstract constructs to concrete representations of those constructs, termed the variables. An operational definition is a series of steps or procedures identifying the way in which the variable is to be measured. It is important here to point out that measurement need not be limited to quantification. Measurement, in this sense, can be represented by
both words and numbers, as long as the procedures for measuring the variables are articulated and could be followed by other investigators to replicate measuring the abstraction in the same way.

Choosing the variables that will represent, or stand for, your abstractions and then specifying the procedures by which you will measure those variables are among the most important decisions you make in the deductive process, since what you measure provides you with the evidence that you will use to draw your conclusions. A rationale behind deductive methods is that predetermination of what you will look at focuses your inquiry and makes it precise, allowing you to include only what you want to include and exclude other factors. The extent that you are able to meet this ideal always remains problematic. In predetermining your constructs, variables, and operational definitions, you introduce potential sources of bias.

Subjecting your own abstractions and operational definitions to the scrutiny outlined above will help you understand the conceptual leaps that are built into your own framework for inquiry. You can use statistical tools to help point out where some gaps between abstraction and operationalization may exist (see discussions of validity and reliability in Kidder and Judd and other texts). Even with numerical indicators pointing toward potential problems, you as investigator need to understand the nature of problems and the effects on your results. Conceptual analysis of this kind can also alert you to situations where you may wish to approach linking constructs and observation in other ways, including using the inductive approach.

Whereas deductive approaches specify the concrete phenomena they will study before they gather data, inductive approaches reverse the order of these activities. Inductive approaches gather information about concrete phenomena in the empirical world, and then from these data—through the process of analysis—abstractions are developed. For this reason, the discussion of specifying the connection between abstraction and observation will be treated in more detail in the discussion of step five—analysis and interpretation.

Under what circumstances might you, as an investigator, consider inductive approaches to linking abstractions with concrete phenomena? Three lines of reasoning will be presented that provide slightly different although somewhat overlapping rationales for choosing to conduct inquiry following inductive approaches. The first rationale uses terms such as discovery or exploration and covers situations where the investigator wants to get a sense of what the relevant or influential phenomena are. Perhaps the investigator is not ready to settle on particular constructs or hypotheses. Perhaps the investigator feels that the variables that have been investigated in past work have not
satisfactorily explained the situation and wishes to explore other approaches. Discovery or exploratory use of inductive methods may lead to the specification of particular constructs and variables that can generate models and hypotheses. Brinberg and McGrath (1985) call this activity the prestudy or generative phase “in which a researcher develops, clarifies, and refines the elements and relations” (p. 26) of the area of interest. Strauss and Glaser (1967) have described a similar activity as “grounded theory,” and Eisenhardt (1989) describes the process of developing abstractions from the ground up in specific, procedural terms, making her article a good place to start exploring this tradition.

In our CD-ROM example, using the constructs of clerical, technical, and professional tasks, an investigator may decide, perhaps after struggling with criteria for defining these tasks as they relate to CD-ROMs, that these categories are problematic. He or she may choose instead to collect data about as many tasks connected with CD-ROMs as possible and then analyze the data to determine the relevant abstract ways of describing tasks. He or she may also feel that this approach will suggest relationships between either types of staff and activities or between activities and staff attitudes, or between other factors that he or she does not yet anticipate.

A second rationale for using inductive approaches goes beyond exploration, although the notion of discovering relationships by analyzing a broad spectrum of data is certainly included. This rationale is founded on the assumption that it is difficult for the investigator to identify, from an outside perspective, the terms that are meaningful to those actually in a specific situation. An underlying assumption is that people act on the basis of what objects and situations mean to them, and that this meaning arises from the person, acting within the situation. In this view, operational definitions formulated by deductive investigators may or may not coincide with the way the participants themselves define phenomena. Therefore, although participants in deductive inquiry may provide data within the categories, that data will not reflect distinctions that the participants themselves would make. And since these distinctions form some of the basis for participants' actions, the deductive investigator is missing important data relating to behavior.

Applying this rationale to the CD-ROM example would lead us to want to know how the staff members themselves perceive the tasks related to CD-ROM. This rationale would argue that the investigator should not predefine the tasks for the respondents but instead should design data collection to allow the understandings and attitudes the staff have toward these tasks to be captured. The distinction being made
Choosing Research Methodologies

here can be illustrated by analogy to traditional ways of gathering reference statistics in libraries. These statistics are typically gathered in categories such as “short” or “ready” reference, extended reference, or directional questions. Many librarians working with such statistics have wondered how much homogeneity there is in the responses in each category. Does every librarian have the same definition of a short reference question or a directional question? And if not, does lumping them all together hide some useful distinctions? Inquiry that focuses on understanding how participants view situations themselves comes from several different research traditions, including ethnographic research (for example, see Spradley [1980]) and naturalistic inquiry (see, for example, Lincoln & Guba [1985] or Mellon [1990]).

A third rationale for inductive approaches stresses the importance of viewing complex phenomena like social and organizational situations from a holistic point of view. This reasoning assumes that focusing on a limited number of variables at a time distorts the total picture and ignores the complexity of many interrelated parts. The reasoning further argues that since the whole is more than the sum of the parts, the parts change, or lose meaning, when they are viewed in isolation. Although gathering a broad spectrum of data does not in itself ensure that complexity can be captured or understood, such an approach, its proponents argue, provides a better view than an approach that dissects the whole into parts or variables. This view tends to stress integrated interpretation that reasons from concrete empirical data, including the understandings of participants, and develops an interpretation which it then checks against additional data or additional situations.

In the preceding section, we have examined some broad strategies for approaching the link between abstraction and concrete phenomena. Both deductive and inductive approaches have strengths that suit them for certain kinds of problems, and both introduce sources of biases. You, as investigator, have the task of choosing the strategy that best fits your purposes, a strategy that will err in ways that are least likely to compromise your results.

Observing the Empirical World

Whatever approach you choose to link abstraction to phenomena in the empirical world, you will need to design strategies to collect data on those phenomena. If you have followed deductive strategies, you have already specified a set of procedures, or parameters, that will guide you in data collection. However, you will still need to develop and use your data-gathering instrument, and in doing so, you will be again narrowing or limiting the data that you will be gathering.
If you have followed inductive strategies, you have developed your focus, and in addition, you will need a more or less specific plan to guide data collection. The details of your plan will be shaped by your focus and by how much you wish to prespecify your data collection efforts. You will need to consider questions such as the following: From whom will you gather data? Over what period of time? On what topics or subjects? What types of data? Under what circumstances will you gather data? How will you record responses (e.g., from memory, with tape recorders, on forms)? What questions will you ask? Will you ask the same questions of everybody? Will you use prespecified wording?

Specification of the way you will observe the empirical world is an activity common to both deductive and inductive traditions, and similar problems arise. To illustrate some of these choices, we return again to the issue of the CD-ROMs: Suppose that you have decided to collect data on the activities of reference staff in relation to CD-ROMs. Who will you ask to provide you with this information? You can ask the reference staff themselves what activities they perform; you can ask someone else in the situation, the head of Public Services for example, or perhaps the support staff members or the patrons; you can look for what is called "trace" evidence, artifacts that indicate activity has gone on (in this example, calls to service people; ribbons and paper used; searches performed would all be trace evidence); or you, as a investigator, can observe, either as an outsider or as a participant. Each of these sources of information will provide a different perspective on the activities involving CD-ROMs that the reference staff perform, and it can be argued that each provides a partial picture. Each also has a characteristic bias, resulting from the perspective each information source brings to the question. Because many data-gathering techniques rely on self-report data, it will be considered briefly here.

Self-report data (and data provided by any other individual including the investigator as observer) will reflect the way that individual views the situation. The key question for the investigator is whether that view is biased, or different from other views, in a way that is relevant to the research question. Suppose, for example, the reference librarian reports an activity as "taught search strategy to patron using PsychInfo." As a investigator, you might ask yourself whether all participants providing information about CD-ROM activity will mean the same thing by those words. Or, to look at the other side of the problem, will every participant who explains boolean logic to a patron record that activity on the form using the same words?

Suppose another participant explaining boolean logic to a patron had described the activity as "explained commands to patron." Would you as researcher recognize the same underlying activity, or would you conclude that the two different descriptions referred to two different
actions? If you feel that the distinctions reflected here will not obscure phenomena that are important for your research question, then the issue of participants’ perspective may not be important in this instance. If, however, you feel that the underlying distinctions behind these characterizations of activities are important to keep clear, then you need to give more thought to the issue of perspective. One compromise frequently encountered is to gather information from several perspectives. For example, the investigator might ask the reference staff to keep a diary of activities, perhaps using a random alarm device. The investigator could also observe sessions in which the staff kept these logs and compare his or her assessment of activities with the assessments of the librarians. If the investigator found high consistency among all participants, then he or she can have confidence that multiple perspectives are not unduly influencing data gathering. If, on the other hand, the investigator discovers widely differing descriptions of the same activity, perhaps among staff members, that difference might then become the focus of investigation.

We have been talking about observations that have been gathered in verbal form. Collecting data in words provides you with great variety in data and introduces many complications in aggregating and describing that data. It also introduces complications, as we have seen, in understanding what phenomena those words referred to and in comparing phenomena. When drawing conclusions—interpreting verbal data—further complications arise concerning multiple meanings.

It is important to note, however, that gathering data in categories or as numerical responses on a scale does not avoid the issues of multiple meanings inherent in gathering verbal data. The initial problem of aggregation is somewhat simplified, since you can count categories and use descriptive statistics to provide numerical summaries. However, the problem of multiple meanings has been submerged rather than erased. You still need to be reasonably certain that all respondents had reasonably similar understandings of the categories. The analogy of library statistics is again useful here. Does everyone have the same definition of a reference or a directional question? What are the implications for the aggregated totals if individuals have interpreted the categories differently? And if variation of understanding of the categories is possible or probable, what are the implications for the similarity of the interpretations of the aggregated totals by the investigator and the consumers of the results?

The key question for you as investigator is this: Will multiple meanings that participants, investigators, and readers have result in misunderstanding of important issues embedded in the problem you are investigating? If so, a combination of measurement techniques may be needed to provide both aggregation and sufficient clarity for
interpretation. Structured and unstructured interviews, surveys, observation, analysis of documents, and performance of tasks can be used in both deductive and inductive data gathering. The way these tools will be used may differ, depending on the specificity with which data is being gathered, and each approach has a wealth of literature specifying appropriate techniques. The investigator's task is to choose and adapt the tools that best fit the purposes of the specific research question.

Analysis and Interpretation of Data

Analysis and interpretation of the finding of empirical inquiry is more or less dependent on decisions made in earlier phases of inquiry, although the extent of that dependency varies in different traditions of research. For deductive strategies, analysis and interpretation theoretically come after the data have been collected. Techniques for data analysis, specifically numerical and statistical techniques, are well worked out and discussed at length in the literature and are too voluminous and complex to be discussed here (see Miller [1991] for an introduction to these topics and use his bibliographies for follow-up).

In inductive strategies, the link between abstraction and concrete empirical phenomena is developed through a reiterative process of collecting data from the empirical world, developing tentative explanations or abstractions that make sense of the data, and then returning to the empirical world to assess the abstractions in light of concrete phenomena. The process of testing the abstractions (or hypotheses) proceeds by looking for disconfirming or negative evidence. That evidence can be found in data collected from the initial situations, but most inductive traditions incorporate an active search for disconfirming evidence guided by reasoning about what disconfirming evidence might look like and where it might be found.

Suppose, for example, that you, as an inductive investigator, were investigating the activities of library staff in relation to CD-ROM activities and gathered interview and observational data through a variety of methods over the course of several weeks. Let us further suppose that preliminary analysis of that data led you to speculate that people with positive attitudes toward computers provided much more help to users than those with negative attitudes. As a first step in exploring this explanation, you might go back either to your data, or preferably to the empirical world itself, looking specifically for people with less than positive attitudes toward computers and analyzing their patterns of helping users.

Suppose, further, that you then began to see what you thought were patterns within the patterns you had identified as positive and
negative attitudes. At first, you might see these patterns represented only by one person, as for example, the librarian who criticized automation as making the staff dependent on machines, while at the same time praising the ability of the computer to do keyword subject searching. As you examined the responses of more people, you might begin to group together similar expressions of views about computers and perhaps eventually suggest categories of attitudes along different dimensions than positive and negative. You might then return to the empirical world to look for observations that did not seem to fit your new categories.

In inductive approaches, the interpretations—or the development of abstractions—perform the function of aggregation in deductive approaches; they simplify the diversity of individual cases by providing descriptive abstractions, often in the form of categories or constructs. In other words, interpretation creates the link between the observation and the abstraction by defining it. The four potential weaknesses involved in linking abstraction and observation apply at this stage. In deductive traditions, numerical processes (tests for validity and reliability) can help somewhat in alerting the investigator to these problems. In inductive approaches, and in the interpretation by which the deductive investigator extends analysis of categories to further abstractions that they represent, there are fewer cut-and-dried indicators. The primary inductive tool is to assess each abstraction against as much data from a wide variety of situations—often systematically selected—in order to detect anomalies of fit. Techniques in inductive traditions are proliferating in the current wave of interest in these methods, providing both procedures and examples of ways to minimize bias in the matching of abstraction and observation (see, for example, Miles & Huberman [1984] or Strauss [1987]).

CONCLUSION

In summary, this paper has proceeded under the assumption that all empirical inquiry—observation systematically linked with abstraction—introduces bias of one sort or another. Although it is the function of method to systematize inquiry and thus reduce potential bias, the method itself is also a source of bias. Investigators have the responsibility of understanding the sources of potential bias introduced by the methods that they use in all activities of the process of empirical inquiry and of using that understanding in the formulation of the conclusions that they eventually present as the result of their inquiry.
REFERENCES


