Chapter 2

Systems of Inquiry and Standards of Research Quality

2.1 INTRODUCTION

In Chapter 1, we argued that any researcher's choice of a particular research design is necessarily framed by the researcher's own assumptions about both the nature of reality and how one can come to apprehend it. We have used the term system of inquiry to describe these sets of assumptions; another term that is frequently used to describe such assumptions is paradigm. Both terms convey the notion of a worldview, the ultimate truthfulness of which cannot be established.

For example, in one study, Meched and Nolak present an analysis of heat transfer through a double-pane window. They aim to evaluate the performance of specific double-pane window designs through a combination of computer simulation and experimental testing. They introduce the research question this way:

An element [double-pane window] with a semi-open cavity and a siphon of different shapes as an integral part of the window was developed [on the basis of previous research]. The cavity is formed by lowering blinds or closing screens over the outer side of the window. The siphon at the top of the cavity is formed by the housing and always has the same shape, while the bottom of the cavity can be opened or closed. In this way a cavity with different siphons is established.... Different cavities are presented in Fig. 2.1. Heat transfer through a closed cavity with a 'Y' shaped siphon was analyzed in this study [positions a and c in Fig. 2.1].
From this short excerpt, it is clear that the authors have conducted their research within a system of inquiry that assumes the physical reality of objects, whose properties can be accurately specified, their performance measured by calibrated instruments, and the outcomes compared in quantifiable terms. In other words, there is a reality "out there" that we can know and define systematically.

Next is the example of Benjamin Schwarz's study of the design process in the development of nursing homes, examined through three case study projects. (See Figure 2.2) The ontological assumptions that frame his research are stated this way:

"This inquiry . . . [allowed] access to the inherent complexity of social reality . . . A design process cannot be regarded as a system made up of totally objectified elements and observable, measurable facts. Therefore, an effort was made to avoid simplification of the social phenomena of the design process." 4

Schwarz's commentary reflects his assumption that reality is nuanced by the complexity of social relations, rather than being limited to the objectively measured reality posited by Medved and Novak.

Third, and last, is the example of Diane Favro's study of the well-known early-twentieth-century California architect Julia Morgan (1872–1957). 5 By way of introduction, Favro cites a quotation from a 1931 interview with Julia Morgan in which she is asked about women's contribution to the field of architecture. Morgan demurs and comments that women professionals have so far contributed little or nothing, though they might in the future. Favro then compares these comments with the response of Linda Nochlin, who in 1972 was asked why there had been no great women artists; to which Nochlin replied that "as a disenfranchised group, women artists had limited opportunities for greatness." 6 Favro then goes on:

Thus, Nochlin correctly deduced, the question itself is inappropriate. Women architects similarly have been evaluated according to masculine criteria. To be accurate, every evaluation of female practitioners must consider how gender affected their careers, designs, and recognition. 7

With this introduction, Favro is clearly signaling that her study of Morgan will challenge existing orthodoxies regarding how the careers of architectural practitioners in general, and women in particular, are assessed.

These three examples clearly demonstrate the great variety of paradigms—or systems of inquiry—within which architectural research is typically conducted. Although both Schwarz and Favro, for whatever reasons, chose to be quite explicit about the systems of inquiry underlying their particular studies, it is far more often the case that researchers are relatively inexplicit about their study's ontological assumptions (e.g., Medved and Novak). While the experienced researcher is likely to be able to infer the paradigmatic frame of a given study, less experienced readers may be left wondering or confused about why the study was structured and presented in a particular way.

Thus the goals of this chapter are twofold: 1) to provide a conceptual framework for understanding the range of paradigms commonly employed in architectural research; and 2) to clarify the way in which standards for evaluating research quality are substantially dependent on the system of inquiry employed by the researcher.
2.2 FRAMEWORKS FOR UNDERSTANDING MULTIPLE SYSTEMS OF INQUIRY

Because the practice of architecture requires knowledge of a vast array of phenomena—from the physical properties of materials to principles of visual perception—it is hardly surprising that the research subdisciplines within architecture bring with them a broad range of paradigms. Indeed, this is also the case within entire disciplinary families—e.g., within the natural sciences, the social sciences, or the humanities. From the perspective of someone in the humanities, "science" may seem to represent a rather monolithic system of inquiry within which a highly standardized set of procedures is adopted; but from a scientist’s point of view, there are vast differences between scientific disciplines with respect to the typical methods employed and their standards for the credibility of evidence. As a consequence, many scholars of research methodology from a variety of disciplines have developed models or frameworks for clarifying the similarities and differences among systems of inquiry.

In the following chapter segments, we will briefly review several of these frameworks, and then introduce a three-part framework that we will utilize throughout the remainder of this book.

2.2.1 A Dichotomous Framework

In a 1990 Journal of Architectural Education article, Julia Robinson characterized the then current state of architecture research as one in which a dichotomous set of paradigms predominated. (Even now, the circumstances she describes are not so very different.) While the stated goal of her article was to offer a means of resolving this dichotomy into a more integrated framework for architectural research, she nevertheless offered a rather stark differentiation of the two contending research paradigms. Two fairly distinct communities of architectural researchers “find different explanations acceptable,” according to Robinson. Their ideas “of acceptable explanation do not necessarily coincide.”

The terms by which she chooses to describe these two systems of inquiry are science and myth. Although both science and myth “are used to explain,” the way they do so is quite different. A scientific explanation is typically portrayed as a mathematical description made up of linked fragments; it is thereby atomistic, reductionistic, and convergent. Architectural research on technology, engineering, or behavioral issues are seen as representing the scientific paradigm. On the other hand, mythic or poetic description is seen as continuous, holistic, divergent, and generative; this paradigm is usually associated with architectural research drawn from an arts and humanities base. This would include much of the scholarly work in architectural history and design theory.

Although Robinson’s use of the “science vs. myth” terminology is relatively idiosyncratic, the notion of a dichotomous set of research paradigms is commonplace in architecture and other research disciplines. Perhaps the most common device for framing such a dichotomous model employs the terms quantitative vs. qualitative. At its most basic level, this terminology assumes that quantitative research depends on the manipulation of phenomena that can be measured by numbers; whereas qualitative research depends on nonnumerical evidence, whether verbal (oral or written), experiential (film or notes about people in action), or artifactual (objects, buildings, or urban areas).

Unfortunately, the quantitative/qualitative terminology, though beguilingly simple, places the emphasis on distinctions at the level of tactics, i.e., the techniques for gathering or interpreting evidence or data. But, distinctions between research methods at this level are often not nearly so clear cut. Many research studies employ
Figure 2.4 In her studio teaching, Julia Robinson had her students evaluate institutional living environments, the results of which were subjected to statistical, "scientific" analysis. © ACSA Press, Washington, D.C., 1993.

A combination of quantitative and qualitative tactics. Even research areas normally associated with a quantitative paradigm, such as architectural history, may necessarily require significant quantitative techniques. For example, in Fernando Lara's study of the acceptance of modern architecture by the Brazilian middle class, a quantitative analysis was conducted based on documentation of the facade elements of 460 houses in Belo Horizonte. In this case, the quantitative analysis complemented interviews and archival material that focused on how and why the houses were built as they were. (For more details on this study, see Chapter 12.)

At another level however, the quantitative/qualitative framework entails certain ontological and epistemological assumptions, as well as implications for methodological choices, that mirror those described by Robinson. Figure 2.6 represents an abbreviated version of John Creswell's matrix for differentiating quantitative and qualitative research paradigms in the social sciences. Within this model, quantitative research assumes an objective reality and a view of the researcher as independent of the subject of inquiry. Qualitative research, on the other hand, assumes a subjective reality and a view of the researcher as interactive with the subject of inquiry. On a methodological level, the quantitative paradigm is seen as involving a deductive process of inquiry that seeks cause-and-effect explanations; whereas the qualitative paradigm

Figure 2.5 Robinson also had her students sketch a sociable home environment based on the "mythic" qualities that were evoked. Drawing by Michela Malvady. © ACSA Press, Washington, D.C., 1993.
<table>
<thead>
<tr>
<th>Assumption</th>
<th>Question</th>
<th>Quantitative</th>
<th>Qualitative</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ontological Assumption</td>
<td>What is the nature of reality?</td>
<td>Reality is objective and singular, apart from the researcher.</td>
<td>Reality is subjective and multiple as seen by participants in a study.</td>
</tr>
<tr>
<td>Epistemological Assumption</td>
<td>What is the relationship of the researcher to that researched?</td>
<td>Researcher is independent from that being researched.</td>
<td>Researcher interacts with that being researched.</td>
</tr>
<tr>
<td>Methodological Assumption</td>
<td>What is the process of research?</td>
<td>Deductive process cause and effect</td>
<td>Inductive process mutual simultaneous shaping of factors.</td>
</tr>
</tbody>
</table>

Figure 2.6 Quantitative and Qualitative Paradigm Assumptions. Adapted from John Creswell, *Research Design: Quantitative and Qualitative Approaches* (Thousand Oaks, Calif.: Sage Publications, 1994, p. 5). By permission of Sage Publications.

necessitates an inductive process of inquiry that seeks clarification of multiple critical factors affecting the phenomenon.

Even within the family of physical sciences, this dichotomous framework for differentiating systems of inquiry is frequently employed. When the terms quantitative and qualitative are employed in the sciences, they are often associated with the corresponding terms hard vs. soft.

The implication is that the sciences that depend on numerical measurement (e.g., physics) are hard, while those that rely on description and classification (e.g., biology or geology) are soft.

In our view, however, this dichotomous framework is often misleading. First, as indicated earlier, the quantitative/qualitative terminology places undue emphasis on the level of tactics, instead of that of ontological and epistemological assumptions. As numerous examples of architectural research throughout this book will demonstrate, both numerical and nonnumerical evidence can be deployed in the service of more than one system of inquiry.

Secondly, at least as characterized by Creswell's framework and others like it, there is an assumption that each of the two paradigms necessitates a particular research methodology. For example, the quantitative system of inquiry is assumed to be manifested in deductive methodology that seeks to discover cause-and-effect explanations. While we do not deny that there may frequently be such an association of quantitative data and deductive methods, this is not an invariable and necessary relationship. A system of inquiry will indeed frame the articulation of a research question, but there is not a one-to-one relationship between that system of inquiry and a particular research design. Indeed, in the chapters that follow, we will intentionally include examples of architectural research that employ research designs atypical of that particular topic area and system of inquiry.

2.2.2 A Continuum Framework for Multiple Systems of Inquiry

In their 1980 review of the state of architectural research, Joroff and Morse map out the range of architectural research methods along a nine-point continuum from informal observation on the one hand to laboratory research on the other. (See Figure 2.7) While this framework identifies what appears to be a full range of architectural research areas representing different systems of inquiry, the organizing concept for the continuum is essentially consistent with the dichotomous model described above. This is because the underlying concept that organizes the scalar order is the degree of "systematization" that characterizes the different methods. In clarifying this concept, the authors suggest that systematization entails two basic ideas: 1) the idea that there is a reality "out there"; and 2) the assumption that to know this reality requires "objective" methods.

In effect, then, Joroff and Morse's proposed scalar framework mirrors the objective vs. subjective concept of the dichotomous model. The left side of the model represents the more "subjective" paradigm, and the right side the more "objective" paradigm. Although they introduce the framework as "an overall integrating context for divergent research efforts," they also propose that such a framework is needed "to distinguish research from other activities in which architects may engage." Indeed, in discussing the examples on the left side of the scale, Joroff and Morse invoke a variety of qualifiers and cautions, none of which are applied to the more objective and systematic examples on the right. For example, they write that when architects review precedents during the design process, "it is an assessment of knowledge gained by others rather than research in the strict definition of the term." Moreover, by equating research with the term systematic and systematic with the belief that there

![Figure 2.7 Michael Joroff and Stanley Morse's conceptual framework for architectural research. By permission of Michael L. Joroff.](image-url)
is a reality "out there," they are essentially arguing that "real" research exists only at the objective end of the scale.

Like Joroff and Morse, many scholars in other disciplines have also sought to provide a more fine-grained conceptual framework than the dichotomous model based on the quantitative vs. qualitative distinction. One especially instructive example is provided by Morgan and Smircich writing for a diverse audience of social scientists, who, like architectural researchers, are likely to represent the a full range of ontological stances.\textsuperscript{19} Morgan and Smircich explicitly argue that "the dichotomization between quantitative and qualitative methods is a rough and oversimplified one."\textsuperscript{20} Their concern is that particular "quantitative" or "qualitative" tactics for gathering or interpreting evidence might be employed for their own sake, without reference to the paradigmatic frame of reference within which they are used. They go on to emphasize the "need to approach discussions of methodology in a way that highlights the vital link between theory and method.\textsuperscript{21}

The framework that Morgan and Smircich propose is, like Joroff and Morse's, a continuum, with the terms subjective and objective framing the end points. (See Figure 2.8) Within this framework, they identify and label six paradigmatic positions, indicating for each their core ontological assumptions and assumptions about human nature. Notably, however, they refrain from specifying particular strategies or tactics that might be associated with these positions. Indeed, they argue that such a one-to-one correspondence between a given system of inquiry and a particular strategy or tactic would be counterproductive.

![Figure 2.8: Continuum of research paradigms, 1980. Reproduced by permission of Copyrights Clearance Center.](image)

[...]

Any given technique (tactic) often lends itself to a variety of uses according to the orientation of the researcher. For example, participant observation in the hands of a positivist may be used to document the number and length of interactions within a setting, but in the hands of an action theorist the technique may be used to explore the realms of subjective meaning of those interactions.\textsuperscript{22}

Our own position regarding the relation of systems of inquiry to strategies and tactics is consistent with that articulated by Morgan and Smircich. On the one hand, there should be coherence and consistency among these characteristics within any given research study. But on the other hand, when a researcher adopts a particular system of inquiry, that decision does not automatically determine either the strategy or the tactics for the study. Rather, a variety of both strategies and tactics can be orchestrated in ways consistent with the chosen paradigm.

To illustrate this point, we invoke a rather humorous analogy to a child's toy where a variety of heads, bodies, and legs can be interchanged to create a host of assembled characters. To be sure, some result in improbable combinations of twisted genders and incongruent body forms, just as not all combinations of strategies and tactics make sense within a particular system of inquiry. On the other hand, given the selection of a particular "head" (system of inquiry), many different bodies and legs (strategies and tactics) can be linked to form a credible and coherent character (research study).
2.2.3 An Alternative Framework: Tripartite Clusters

As an alternative to the two most frequently used models—the dichotomy and the continuum, we propose here the notion of three paradigmatic clusters: positivist, naturalistic, and emancipatory. (See Figure 2.10) This tripartite model has been proposed by several methodologists (e.g., Le Compte and Prissue; Mertens), albeit with slightly different nomenclature. By cluster we mean to suggest that there are any number of very particularized systems of inquiry (e.g., critical theory and feminist theory) that share some common ontological and epistemological assumptions. One advantage of this framework is that it does not postulate a particular ordering along a unitary dimension. The matrix in Figure 2.10 summarizes the nature of these three paradigmatic clusters.

**Postpositivism.** Many research theorists use this term to describe a system of inquiry that emerged from the earlier traditions of positivism. Whereas positivism was characterized by what many would describe as a "naive" belief in a reality "out there" that can be fully known, postpositivism is characterized by a more nuanced belief in an "out there" reality that can only be known within some level of "probability." And whereas positivism assumes that objectivity can be achieved in the research process, postpositivism presumes that objectivity is a legitimate goal that may be imperfectly realized. Postpositivists also acknowledge that the experimental model often used in the natural sciences is often inappropriate for research involving people. As a result, modifications and accommodations may have to be made in research practices, particularly in the use of quasi-experimental procedures. (See Chapter 9 for details.)

**Naturalism.** The naturalistic paradigm has gradually emerged to greater prominence over the last two or three decades. Although we have adopted the term *naturalism*, other authors have proposed a variety of other names for this paradigmatic cluster, including qualitative, phenomenological, hermeneutic, and interpretive/constructivist (Guba and Lincoln; Mertens). The basic ontological premise of naturalistic research is that there are multiple, socially constructed realities. The corresponding epistemological position is that it is neither possible nor necessarily desirable for research to establish a value-free objectivity. Rather, naturalistic researchers recognize the value and reality of the interactive dynamics between the inquirer and the people or setting being studied. In a similar vein, they also make sure they are explicit in stating the theoretical position and values inherent in their work, and acknowledge the role of interpretation and creation in reporting their findings.

**Emancipatory.** The emancipatory paradigm emerged over the last two or more decades in response to growing discomfort with the dominant research paradigms and procedures, particularly the postpositivist system of inquiry. In particular, a variety of researchers in a number of disciplines began to point out the unconscious dominance of racial, ethnic, gender, and Western-focused biases in the vast majority of research. Although we have chosen to use the term emancipatory, this paradigmatic cluster includes research from several research streams across many disciplines, including critical theory-based, feminist, race-specific, participatory, and transformative.

Emancipatory research shares with the naturalistic cluster a recognition of multiple realities, but it also stresses the role that social, political, cultural, ethnic, and gender issues play in the social construction of reality. There is as well a tendency to focus on the dynamics of power and marginalization as they affect less dominant groups. At an epistemological level, emancipatory researchers also share with the naturalists a recognition of the interactive dynamics between researchers and participants. But in addition, they highlight the historically and socially situated context in which the study respondents find themselves.

<table>
<thead>
<tr>
<th>Basic Beliefs</th>
<th>Postivism / Postpositivism</th>
<th>Interpretive / Constructivist</th>
<th>Emancipatory</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ontology (nature of reality)</td>
<td>One reality; knowable within probability</td>
<td>Multiple, socially constructed realities</td>
<td>Multiple realities shaped by social, political, cultural, economic, ethnic, gender, and disability values</td>
</tr>
<tr>
<td>Epistemology (nature of knowledge; relation between knower and would-be-known)</td>
<td>Objectivity is important; researcher manipulates and observes in dispassionate, objective manner</td>
<td>Interactive link between researcher and participants; values are made explicit; created findings</td>
<td>Interactive link between researcher and participants; knowledge is socially and historically situated</td>
</tr>
</tbody>
</table>


2.2.4 The Complementarity Nature of Research Framed by Diverse Systems of Inquiry

Finally, and most importantly, the larger intent of Figures 2.9 and 2.10, is to convey the stance to which we are committed in writing this book, specifically that each system of inquiry can provide an appropriate and useful frame of reference for architectural
research. Good research that yields important theory or significant practical applications can be achieved within any one of these paradigmatic clusters. Likewise, adherence to a particular system of inquiry—however esteemed within a particular subdiscipline of architectural research—is no guarantee for achieving high-quality research. In that, the analogy to architectural style is directly pertinent; though we may individually prefer to design in a particular style, we have to acknowledge that there are both good and bad exemplars of that style. Adherence to either classicism or art deco, postmodernism or neomodernism, does not in and of itself assure quality.

2.3 MEASURES OF RESEARCH QUALITY

In an inherently interdisciplinary field, such as architecture, a common tendency is for researchers, who might work primarily or only within one system of inquiry, to evaluate research from a different system of inquiry according to the standards of quality they know best. For example, researchers whose work falls clearly within an objective paradigm may tend to judge research done in either a naturalistic or emancipatory paradigm by the standards they employ for "objective" research. Not surprisingly, this can lead to a lot of heated arguments about whose work is really "research" and whose is not. In such instances, the potential benefits of tackling research topics in architecture from a variety of perspectives is virtually negated. Instead, we believe it is far more productive to evaluate quality in architectural research according the standards that have been developed by methodologists working within the various paradigmatic traditions. Figure 2.11 presents a comparative analysis of quality standards that are representative of two of the three paradigmatic clusters: the postpositivist and the naturalistic. The emancipatory is not represented in this figure because advocates of this position generally question the relevance of the standards set by the postpositivist tradition in the first place; instead they advocate quite a different set of standards, to which we will turn later.

A second important feature of the matrix in Figure 2.11 is that the relevant quality criteria (in the left column of the matrix) have been identified using "generic" terms that are not associated with any particular system of inquiry.27 The obvious purpose in doing so is to avoid privileging the terms and concepts associated with any one of the three paradigm clusters. Nevertheless, it might be objected that this matrix still privileges the postpositivist paradigm standards because the terms proposed for the naturalistic paradigm have been devised as comparable and equivalent to those postpositivist standards. Indeed, even the originator of Figure 2.11, Egon Guba, has since critiqued its formulation for precisely these reasons.28 While we acknowledge this point, we believe that Figure 2.11 is still a useful framework for understanding important similarities and differences between these two systems of inquiry. In addition, our discussion of research executed within the other paradigmatic traditions (both in this and subsequent chapters) should allow other indicators of quality to be represented. To this end, a discussion of quality standards for each of the research strategies we examine will be presented in Chapters 6 through 12.

2.3.1 Quality Standards within a Postpositivist System of Inquiry

For better or worse, many readers are likely to be at least somewhat familiar with the standards of quality identified with the postpositivist paradigm. This is because they have been codified, discussed, and presented in methodology texts for many years. And as suggested earlier, because the standards within the other two paradigmatic clusters have been less explicitly codified, or codified more recently, there is often a tendency among researchers to apply the "postpositivist" standards to research...
executed within the other systems of inquiry. Although we believe this tendency is a mistake, we have nevertheless chosen to begin with the postpositivist paradigm, simply because it already is a starting point for many researchers.

**Internal Validity.** Although there are many subcategories of internal validity, the fundamental issue is whether the key concepts and operations of the study are truthful representations of the object of study. For example, we might ask whether a housing satisfaction questionnaire really measures residents' satisfaction with their housing. This requires a clearly stated definition of what would constitute housing satisfaction, and a rationale for the correspondence between the question items and that definition. Or perhaps we have reason to develop a new housing questionnaire. We might want to make sure that the results using that questionnaire correspond to a previously developed questionnaire on housing.

In the case of Medved and Novak's study of double-pane windows, the authors carry out their testing of the windows' performance primarily through a computerized, numerical simulation model. But how can we trust the validity of the simulation model? The authors describe in considerable detail a validation process using physical experimentation based on actual window pane assemblies. Among their several goals in doing so is "to prove the agreement of numerical values and experimentally established heat flux and temperatures in selected areas in which sensors are located." Having subsequently established the validity of the numerical model, the authors then proceed to use the numerical model to test the performance of a set of window pane designs.

**External Validity.** The question behind this criterion is whether the results of the study are applicable to the larger world, or at least whether there are defining contextual constraints within which the results are valid. In the case of the window pane study, the authors are quite specific and clear in stating that the window designs were tested using meteorological data for the central European climate. Within these climatic conditions, the authors conclude that window pane designs using a cavity with a "y" siphon are highly efficient, and comparable in efficiency to closed cavity designs. What if we want to use this window pane design in New York or California? We have two choices. At a more informal level, we might compare the climate data for New York or California with that of central Europe, and we would then make a calculated judgment about the degrees of similarity in climate. We might well conclude that the climates of New York and central Europe are similar enough to expect the same results and similarly, we might conclude that the California climate is too dissimilar to assume comparable results. In that case, we might seek to expand the original study and to run the numerical simulation using the California climate data.

**Reliability.** The concept of reliability is concerned with the consistency of the measurements or findings. Within the postpositivist paradigm, the assumption is that the research methods would yield the same results if the study were conducted under the same conditions in another location or at another time. What might we say then about the reliability of the window pane study? In this case, since the research concerns relatively stable physical objects and properties, the window performance data would be expected to be quite reliable, so long as the physical conditions of the experiments and simulation remain the same. Nevertheless, the authors conclude their article by acknowledging that additional experiments should be carried out over a sustained time period to test for the effects of material degradation. Still, they suggest that since today's building materials are of high quality, the window performance data would likely remain stable.

On the other hand, other architectural studies using an "postpositivist" system of inquiry may involve conditions or social phenomena that require a more detailed examination of reliability. If, for instance, we consider again the example of housing satisfaction research, we might expect similar results in a study in which a sample of residents are surveyed initially, and then again a week or two later. In this instance, such similar results would suggest reliability: inconsistent results would suggest that the questionnaire was unreliable. However, if the survey were administered to the same group a year or two later, after major changes in the housing management occurred, then we would expect that changes in the survey results might well occur. We would then attribute the lack of consistent or stable results to a fundamental change in the conditions of the study rather than to a lack of reliability.

**Objectivity.** Within the "postpositivist" paradigm, the goal for the research procedures is to keep the potential bias or interference of the researcher out of the process. This is achieved by strict specification and administration of the relevant procedures. Typically, the researcher utilizes standardized measurement instruments—whether questionnaires or calibrated equipment; and the sequence and process of experimental manipulation are highly regulated. In the case of the Medved and Novak study, the researchers carefully specify the experimental procedures; detailed diagrams of the window pane designs and the "hot boxes" in which they were tested are provided. Information such as the dimensions, materials, and devices for regulating air temperature are also provided. Armed with these specifications, another researcher could choose to replicate the study, providing yet another test of the results.

### 2.3.2 Quality Standards within a Naturalistic System of Inquiry

In 1981, Egon Guba proposed a new set of quality standards for what he termed naturalistic inquiry. In introducing what he calls "criteria for assessing trustworthiness," Guba has identified a number of key characteristics of naturalistic (or "constructivist," in his current terminology) inquiry, among them: the recognition of multiple realities, as opposed to a single reality; the assumption that generalizations are not necessarily possible in all instances; the understanding that a research design
may emerge as the research proceeds; and the belief that the researcher and the respondent influence and are influenced by each other. Although Guba has subsequently proposed an alternative set of quality standards for naturalistic research, he and Lincoln concede that these quality standards are not well resolved. Because of the heuristic value of the originally developed criteria, we will present them here for discussion and comparison to the postpositivist standards.

The standards of quality that Guba has proposed represent substantially different criteria—though presented in parallel structure—from those associated with the postpositivist system of inquiry. Moreover, Guba provides examples of several procedures for meeting each of these criteria; but given the summary nature of this discussion, we will simply highlight the most essential points.

Credibility. The idea behind credibility is to establish truth value by taking into account the natural complexities inherent in the situation or circumstance being studied. In other words, credibility entails a holistic approach to the research problem. Two particularly important ways of demonstrating truth value are triangulation and member checks. The former involves the use of a variety of data sources, multiple investigators, and/or a combination of data collection techniques in order to cross-check data and interpretations. The latter involves checking the data and interpretations with the respondents and groups from whom the data was solicited, a process that Guba claims "goes to the heart of the credibility criterion." If we return now to Schwarz's study of nursing home design, we find that he reports triangulation, but not the use of members checks. Schwarz achieves triangulation in two distinct ways. First, although he provides details of three separate case studies, he reports that these are a total of eight case study facilities. In other words, his conclusion that the architectural model used for nursing homes is misguided and unduly compromised by code regulations and reimbursement systems is strengthened by his ability to demonstrate this dynamic in multiple instances. Secondly, within each case study, Schwarz indicates that his data derive from:

[Multiple means such as open-ended interviews, document collection, participant observation, and visits to built facilities. Key informants included care providers, owners, architects, gerontological consultants, staff members, committee and board members, state regulators, residents of nursing homes and their families.]

Transferability. Like generalizability—its corresponding term in the postpositivist paradigm—transferability has to do with the extent to which the conclusions of one study can be applied to another setting or circumstance. To achieve transferability, Guba argues, one must provide a sufficiently "thick" description that the relative similarity of the two contexts can be adequately assessed. In the nursing home study, Schwarz is careful to emphasize the particularities of the settings he studied, while at the same time suggesting that similar themes would likely emerge in research on other nursing home settings.

In this tradition . . . researchers are cautious not to generalize because of the personal nature of their observations and specificity of the measurements made in the fieldwork. In most cases, fieldwork can produce results that would not necessarily be replicated by other researchers. Because of the nature of in-depth studies, the themes, results, and conclusions are real and accurate, primarily within their original context. Although no comprehensive generalization was intended in this study, it is safe to assume that the themes described in the three cases are not unique in other design processes of nursing homes.

Dependability. The notion of dependability suggests that there is a fundamental consistency within the data, but it also takes into account "apparent instabilities arising either because different realities are being tapped or because instrumental shifts stemming from developing insights on the part of the investigator as instrument of research."7 The primary device for ensuring dependability is, according to Guba, the establishment of an "audit trail." The audit trail documents all the processes by which data were collected, analyzed and interpreted; this might include interview and observation notes, drawings and diagrams that track people's activity patterns in a building, the investigator's daily journal notes, etc. Schwarz's study does not specify the extent to which he established a comprehensive audit trail. However, one can infer from his discussion of the data analysis that his audit trail may well have been substantial.

The analysis process followed the grounded theory approach [See Chapter 7 for details] in the steps described by Chiale.6 The data were transcribed, coded, and categorized in a search for themes. Due to the limited scope of this article, the themes from the three cases presented here depict only issues related to regulations and the reimbursement systems of long-term care settings. These themes are major anchoring points of the world's [sic] views of the actors in the design process. Quotes are given in their natural form to capture the character of the fieldwork.

Confirmability. Rather than demanding objectivity, Guba argues that the investigator's data and interpretations should be confirmable. This, he maintains, can be achieved through a combination of triangulation and reflexivity on the part of the researcher. We have already discussed the use of multiple methods, sources, and investigators to establish triangulation. Reflexivity requires the investigator to reveal his or her epistemological assumptions, their influence on the framing of the research question, and any changes in perspective that might emerge during the course of the study.
In the example of Schwartz's study, his efforts to establish triangulation have already been noted. And although he does not provide the full measure of reactivity suggested by Guba, he nevertheless makes his stance clear by articulating the system of inquiry within which his research is situated.

2.3.3 Quality Standards within the Emancipatory System of Inquiry

Compared to the quality standards in positivist and naturalistic research, the quality standards pertinent to emancipatory research are conceived in more holistic terms, less tied to specific issues of the actual research procedures. Guba and Lincoln describe three general quality concerns of emancipatory (or in their terminology, "critical theory") research: 1) the historical situatedness of the inquiry; 2) the extent to which the inquiry acts to erode ignorance and misunderstanding; and 3) the transformative potential of the inquiry. 40

**Historical Situatedness.** This concern has to do with the extent to which the inquiry takes into account and highlights the political, gender, ethnic, and racial aspects of the situation or setting under investigation. In Favro's study of Julia Morgan, she very explicitly weaves throughout the article the gender issues that affected women during Morgan's lifetime. 41 For example, she notes that Morgan was one of the few Americans among an almost entirely male group of students to earn a diploma from the Beaux Arts Academy in Paris. Morgan, Favro argues, was determined to do so "to overcome the disadvantages incumbent with her gender." 42 Favro then goes on to suggest that other characteristics of her professional life—such as her decision to downplay her gender, maintain a low profile, and develop a repeat business with influential women clients—were strategies adopted because of the social construction of gender at that time.

**Erasing Ignorance.** Guba and Lincoln (1998) argue that emancipatory research attempts to uncover and make explicit social, cultural, and physical dynamics that have previously gone unnoticed. To this end, Favro makes the point that previous research had often criticized Morgan for the attitudes and practices described above, including, for instance, her lack of "a signature style or theory." 43 Favro argues instead that "her accommodation was a logical response to the professional situation faced as a trailblazer." 44

**Transformational Impulse.** In this quality standard, there is an imperative to action, a desire to somehow transform existing situations or practices. 45 In this regard, Favro makes it clear that she is not only challenging the historically situated value system evident during Morgan's lifetime, but also arguing that the values Morgan embraced and promoted deserve to be at the heart of architecture today. Favro concludes her article this way:

Morgan deserves recognition for all her skill at crafting a profitable, large-scale, and enduring career despite the obstacles presented by her gender... Reacting to preconceptions about women's roles... she emphasized livability, con effec- tiveness, durability, client-satisfaction, and user needs. Difficult to document, non-visual in content, transient, and associated with women, these concrete historically have earned little praise... If these aspects of architecture are thought unimportant, then perhaps the priorities of the architecture profession, not the gender of the architect, should be evaluated. 46

There is no doubt that Favro seeks to provoke changes in the values, attitudes, and practices of architecture as it is currently conceived and practiced.

2.4 CONCLUSIONS: LOOKING AHEAD

Over the course of this chapter, we have sought to demonstrate how the researcher's affinity for a particular system of inquiry is likely to frame the way in which the research question is posed, the selection of the research design, the tactics of information gathering and analysis, and even the practices of the researcher as she conducts the inquiry. Although we will not always attempt to identify the operative research paradigms in the seven chapters on research strategies (Chapters 6 through 12), we suggest that readers keep the paradigms in mind as they consider the strengths and weaknesses of the various strategies.

2.5 RECOMMENDED READINGS


Part I: The Domain of Architectural Research


NOTES

4. Ibid., 257.
6. Ibid., 347.
8. Ibid., 113.
9. Ibid., 113.
16. Ibid., 21.
17. Ibid., 21.
18. Ibid., 22.
20. Ibid., 499.
21. Ibid., 499.
22. Ibid., 498.
30. Ibid., 258.
31. Ibid., 267.
36. Ibid., 355, 356.
42. Ibid., 114.
43. Ibid., 112.
44. Ibid., 112.