

Chapter 3

The Research Process

In Chapter 1, we saw that scientific research is the process of acquiring scientific knowledge using the scientific method. But how is such research conducted? This chapter delves into the process of scientific research, and the assumptions and outcomes of the research process.

Paradigms of Social Research

Our design and conduct of research is shaped by our mental models or frames of references that we use to organize our reasoning and observations. These mental models or frames (belief systems) are called **paradigms**. The word “paradigm” was popularized by Thomas Kuhn (1962) in his book *The Structure of Scientific Revolutions*, where he examined the history of the natural sciences to identify patterns of activities that shape the progress of science. Similar ideas are applicable to social sciences as well, where a social reality can be viewed by different people in different ways, which may constrain their thinking and reasoning about the observed phenomenon. For instance, conservatives and liberals tend to have very different perceptions of the role of government in people’s lives, and hence, have different opinions on how to solve social problems. Conservatives may believe that lowering taxes is the best way to stimulate a stagnant economy because it increases people’s disposable income and spending, which in turn expands business output and employment. In contrast, liberals may believe that governments should invest more directly in job creation programs such as public works and infrastructure projects, which will increase employment and people’s ability to consume and drive the economy. Likewise, Western societies place greater emphasis on individual rights, such as one’s right to privacy, right of free speech, and right to bear arms. In contrast, Asian societies tend to balance the rights of individuals against the rights of families, organizations, and the government, and therefore tend to be more communal and less individualistic in their policies. Such differences in perspective often lead Westerners to criticize Asian governments for being autocratic, while Asians criticize Western societies for being greedy, having high crime rates, and creating a “cult of the individual.” Our personal paradigms are like “colored glasses” that govern how we view the world and how we structure our thoughts about what we see in the world.

Paradigms are often hard to recognize, because they are implicit, assumed, and taken for granted. However, recognizing these paradigms is key to making sense of and reconciling differences in people’s perceptions of the same social phenomenon. For instance, why do liberals believe that the best way to improve secondary education is to hire more teachers, but conservatives believe that privatizing education (using such means as school vouchers) are

more effective in achieving the same goal? Because conservatives place more faith in competitive markets (i.e., in free competition between schools competing for education dollars), while liberals believe more in labor (i.e., in having more teachers and schools). Likewise, in social science research, if one were to understand why a certain technology was successfully implemented in one organization but failed miserably in another, a researcher looking at the world through a “rational lens” will look for rational explanations of the problem such as inadequate technology or poor fit between technology and the task context where it is being utilized, while another research looking at the same problem through a “social lens” may seek out social deficiencies such as inadequate user training or lack of management support, while those seeing it through a “political lens” will look for instances of organizational politics that may subvert the technology implementation process. Hence, subconscious paradigms often constrain the concepts that researchers attempt to measure, their observations, and their subsequent interpretations of a phenomenon. However, given the complex nature of social phenomenon, it is possible that all of the above paradigms are partially correct, and that a fuller understanding of the problem may require an understanding and application of multiple paradigms.

Two popular paradigms today among social science researchers are positivism and post-positivism. **Positivism**, based on the works of French philosopher Auguste Comte (1798-1857), was the dominant scientific paradigm until the mid-20th century. It holds that science or knowledge creation should be restricted to what can be observed and measured. Positivism tends to rely exclusively on theories that can be directly tested. Though positivism was originally an attempt to separate scientific inquiry from religion (where the precepts could not be objectively observed), positivism led to *empiricism* or a blind faith in observed data and a rejection of any attempt to extend or reason beyond observable facts. Since human thoughts and emotions could not be directly measured, there were not considered to be legitimate topics for scientific research. Frustrations with the strictly empirical nature of positivist philosophy led to the development of **post-positivism** (or postmodernism) during the mid-late 20th century. Post-positivism argues that one can make reasonable inferences about a phenomenon by combining empirical observations with logical reasoning. Post-positivists view science as not certain but probabilistic (i.e., based on many contingencies), and often seek to explore these contingencies to understand social reality better. The post-positivist camp has further fragmented into *subjectivists*, who view the world as a subjective construction of our subjective minds rather than as an objective reality, and *critical realists*, who believe that there is an external reality that is independent of a person’s thinking but we can never know such reality with any degree of certainty.

Burrell and Morgan (1979), in their seminal book *Sociological Paradigms and Organizational Analysis*, suggested that the way social science researchers view and study social phenomena is shaped by two fundamental sets of philosophical assumptions: ontology and epistemology. **Ontology** refers to our assumptions about how we see the world, e.g., does the world consist mostly of social order or constant change. **Epistemology** refers to our assumptions about the best way to study the world, e.g., should we use an objective or subjective approach to study social reality. Using these two sets of assumptions, we can categorize social science research as belonging to one of four categories (see Figure 3.1).

If researchers view the world as consisting mostly of social order (ontology) and hence seek to study patterns of ordered events or behaviors, and believe that the best way to study such a world is using objective approach (epistemology) that is independent of the person conducting the observation or interpretation, such as by using standardized data collection

tools like surveys, then they are adopting a paradigm of **functionalism**. However, if they believe that the best way to study social order is through the subjective interpretation of participants involved, such as by interviewing different participants and reconciling differences among their responses using their own subjective perspectives, then they are employing an **interpretivism** paradigm. If researchers believe that the world consists of radical change and seek to understand or enact change using an objectivist approach, then they are employing a **radical structuralism** paradigm. If they wish to understand social change using the subjective perspectives of the participants involved, then they are following a **radical humanism** paradigm.



Figure 3.1. Four paradigms of social science research
(Source: Burrell and Morgan, 1979)

To date, the majority of social science research has emulated the natural sciences, and followed the functionalist paradigm. Functionalists believe that social order or patterns can be understood in terms of their functional components, and therefore attempt to break down a problem into small components and studying one or more components in detail using objectivist techniques such as surveys and experimental research. However, with the emergence of post-positivist thinking, a small but growing number of social science researchers are attempting to understand social order using subjectivist techniques such as interviews and ethnographic studies. Radical humanism and radical structuralism continues to represent a negligible proportion of social science research, because scientists are primarily concerned with understanding generalizable patterns of behavior, events, or phenomena, rather than idiosyncratic or changing events. Nevertheless, if you wish to study social change, such as why democratic movements are increasingly emerging in Middle Eastern countries, or why this movement was successful in Tunisia, took a longer path to success in Libya, and is still not successful in Syria, then perhaps radical humanism is the right approach for such a study. Social and organizational phenomena generally consists elements of both order and change. For instance, organizational success depends on formalized business processes, work procedures, and job responsibilities, while being simultaneously constrained by a constantly changing mix of competitors, competing products, suppliers, and customer base in the business environment. Hence, a holistic and more complete understanding of social phenomena such as why are some organizations more successful than others, require an appreciation and application of a multi-paradigmatic approach to research.

Overview of the Research Process

So how do our mental paradigms shape social science research? At its core, all scientific research is an iterative process of observation, rationalization, and validation. In the **observation** phase, we observe a natural or social phenomenon, event, or behavior that interests us. In the **rationalization** phase, we try to make sense of or the observed phenomenon, event, or behavior by logically connecting the different pieces of the puzzle that we observe, which in some cases, may lead to the construction of a theory. Finally, in the **validation** phase, we test our theories using a scientific method through a process of data collection and analysis, and in doing so, possibly modify or extend our initial theory. However, research designs vary based on whether the researcher starts at observation and attempts to rationalize the observations (inductive research), or whether the researcher starts at an ex ante rationalization or a theory and attempts to validate the theory (deductive research). Hence, the observation-rationalization-validation cycle is very similar to the induction-deduction cycle of research discussed in Chapter 1.

Most traditional research tends to be deductive and functionalistic in nature. Figure 3.2 provides a schematic view of such a research project. This figure depicts a series of activities to be performed in functionalist research, categorized into three phases: exploration, research design, and research execution. Note that this generalized design is not a roadmap or flowchart for all research. It applies only to functionalistic research, and it can and should be modified to fit the needs of a specific project.

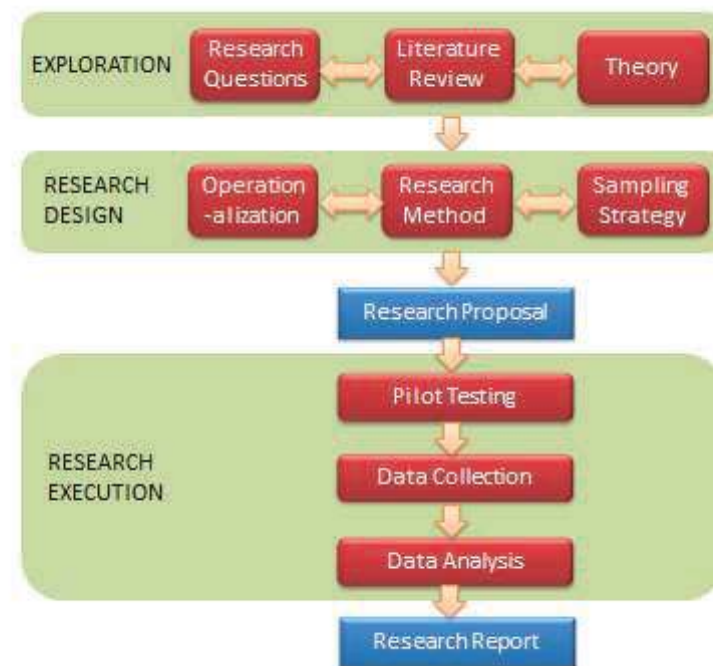


Figure 3.2. Functionalistic research process

The first phase of research is **exploration**. This phase includes exploring and selecting research questions for further investigation, examining the published literature in the area of inquiry to understand the current state of knowledge in that area, and identifying theories that may help answer the research questions of interest.

The first step in the exploration phase is identifying one or more **research questions** dealing with a specific behavior, event, or phenomena of interest. Research questions are specific questions about a behavior, event, or phenomena of interest that you wish to seek answers for in your research. Examples include what factors motivate consumers to purchase goods and services online without knowing the vendors of these goods or services, how can we make high school students more creative, and why do some people commit terrorist acts. Research questions can delve into issues of what, why, how, when, and so forth. More interesting research questions are those that appeal to a broader population (e.g., “how can firms innovate” is a more interesting research question than “how can Chinese firms innovate in the service-sector”), address real and complex problems (in contrast to hypothetical or “toy” problems), and where the answers are not obvious. Narrowly focused research questions (often with a binary yes/no answer) tend to be less useful and less interesting and less suited to capturing the subtle nuances of social phenomena. Uninteresting research questions generally lead to uninteresting and unpublishable research findings.

The next step is to conduct a **literature review** of the domain of interest. The purpose of a literature review is three-fold: (1) to survey the current state of knowledge in the area of inquiry, (2) to identify key authors, articles, theories, and findings in that area, and (3) to identify gaps in knowledge in that research area. Literature review is commonly done today using computerized keyword searches in online databases. Keywords can be combined using “and” and “or” operations to narrow down or expand the search results. Once a shortlist of relevant articles is generated from the keyword search, the researcher must then manually browse through each article, or at least its abstract section, to determine the suitability of that article for a detailed review. Literature reviews should be reasonably complete, and not restricted to a few journals, a few years, or a specific methodology. Reviewed articles may be summarized in the form of tables, and can be further structured using organizing frameworks such as a concept matrix. A well-conducted literature review should indicate whether the initial research questions have already been addressed in the literature (which would obviate the need to study them again), whether there are newer or more interesting research questions available, and whether the original research questions should be modified or changed in light of findings of the literature review. The review can also provide some intuitions or potential answers to the questions of interest and/or help identify theories that have previously been used to address similar questions.

Since functionalist (deductive) research involves theory-testing, the third step is to identify one or more **theories** can help address the desired research questions. While the literature review may uncover a wide range of concepts or constructs potentially related to the phenomenon of interest, a theory will help identify which of these constructs is logically relevant to the target phenomenon and how. Forgoing theories may result in measuring a wide range of less relevant, marginally relevant, or irrelevant constructs, while also minimizing the chances of obtaining results that are meaningful and not by pure chance. In functionalist research, theories can be used as the logical basis for postulating hypotheses for empirical testing. Obviously, not all theories are well-suited for studying all social phenomena. Theories must be carefully selected based on their fit with the target problem and the extent to which their assumptions are consistent with that of the target problem. We will examine theories and the process of theorizing in detail in the next chapter.

The next phase in the research process is **research design**. This process is concerned with creating a blueprint of the activities to take in order to satisfactorily answer the research

questions identified in the exploration phase. This includes selecting a research method, operationalizing constructs of interest, and devising an appropriate sampling strategy.

Operationalization is the process of designing precise measures for abstract theoretical constructs. This is a major problem in social science research, given that many of the constructs, such as prejudice, alienation, and liberalism are hard to define, let alone measure accurately. Operationalization starts with specifying an “operational definition” (or “conceptualization”) of the constructs of interest. Next, the researcher can search the literature to see if there are existing prevalidated measures matching their operational definition that can be used directly or modified to measure their constructs of interest. If such measures are not available or if existing measures are poor or reflect a different conceptualization than that intended by the researcher, new instruments may have to be designed for measuring those constructs. This means specifying exactly how exactly the desired construct will be measured (e.g., how many items, what items, and so forth). This can easily be a long and laborious process, with multiple rounds of pretests and modifications before the newly designed instrument can be accepted as “scientifically valid.” We will discuss operationalization of constructs in a future chapter on measurement.

Simultaneously with operationalization, the researcher must also decide what **research method** they wish to employ for collecting data to address their research questions of interest. Such methods may include quantitative methods such as experiments or survey research or qualitative methods such as case research or action research, or possibly a combination of both. If an experiment is desired, then what is the experimental design? If survey, do you plan a mail survey, telephone survey, web survey, or a combination? For complex, uncertain, and multi-faceted social phenomena, multi-method approaches may be more suitable, which may help leverage the unique strengths of each research method and generate insights that may not be obtained using a single method.

Researchers must also carefully choose the target population from which they wish to collect data, and a **sampling** strategy to select a sample from that population. For instance, should they survey individuals or firms or workgroups within firms? What types of individuals or firms they wish to target? Sampling strategy is closely related to the unit of analysis in a research problem. While selecting a sample, reasonable care should be taken to avoid a biased sample (e.g., sample based on convenience) that may generate biased observations. Sampling is covered in depth in a later chapter.

At this stage, it is often a good idea to write a **research proposal** detailing all of the decisions made in the preceding stages of the research process and the rationale behind each decision. This multi-part proposal should address what research questions you wish to study and why, the prior state of knowledge in this area, theories you wish to employ along with hypotheses to be tested, how to measure constructs, what research method to be employed and why, and desired sampling strategy. Funding agencies typically require such a proposal in order to select the best proposals for funding. Even if funding is not sought for a research project, a proposal may serve as a useful vehicle for seeking feedback from other researchers and identifying potential problems with the research project (e.g., whether some important constructs were missing from the study) before starting data collection. This initial feedback is invaluable because it is often too late to correct critical problems after data is collected in a research study.

Having decided who to study (subjects), what to measure (concepts), and how to collect data (research method), the researcher is now ready to proceed to the **research execution** phase. This includes pilot testing the measurement instruments, data collection, and data analysis.

Pilot testing is an often overlooked but extremely important part of the research process. It helps detect potential problems in your research design and/or instrumentation (e.g., whether the questions asked is intelligible to the targeted sample), and to ensure that the measurement instruments used in the study are reliable and valid measures of the constructs of interest. The pilot sample is usually a small subset of the target population. After a successful pilot testing, the researcher may then proceed with **data collection** using the sampled population. The data collected may be quantitative or qualitative, depending on the research method employed.

Following data collection, the data is analyzed and interpreted for the purpose of drawing conclusions regarding the research questions of interest. Depending on the type of data collected (quantitative or qualitative), **data analysis** may be quantitative (e.g., employ statistical techniques such as regression or structural equation modeling) or qualitative (e.g., coding or content analysis).

The final phase of research involves preparing the final **research report** documenting the entire research process and its findings in the form of a research paper, dissertation, or monograph. This report should outline in detail all the choices made during the research process (e.g., theory used, constructs selected, measures used, research methods, sampling, etc.) and why, as well as the outcomes of each phase of the research process. The research process must be described in sufficient detail so as to allow other researchers to replicate your study, test the findings, or assess whether the inferences derived are scientifically acceptable. Of course, having a ready research proposal will greatly simplify and quicken the process of writing the finished report. Note that research is of no value unless the research process and outcomes are documented for future generations; such documentation is essential for the incremental progress of science.

Common Mistakes in Research

The research process is fraught with problems and pitfalls, and novice researchers often find, after investing substantial amounts of time and effort into a research project, that their research questions were not sufficiently answered, or that the findings were not interesting enough, or that the research was not of “acceptable” scientific quality. Such problems typically result in research papers being rejected by journals. Some of the more frequent mistakes are described below.

Insufficiently motivated research questions. Often times, we choose our “pet” problems that are interesting to us but not to the scientific community at large, i.e., it does not generate new knowledge or insight about the phenomenon being investigated. Because the research process involves a significant investment of time and effort on the researcher’s part, the researcher must be certain (and be able to convince others) that the research questions they seek to answer in fact deal with real problems (and not hypothetical problems) that affect a substantial portion of a population and has not been adequately addressed in prior research.

Pursuing research fads. Another common mistake is pursuing “popular” topics with limited shelf life. A typical example is studying technologies or practices that are popular today. Because research takes several years to complete and publish, it is possible that popular interest in these fads may die down by the time the research is completed and submitted for publication. A better strategy may be to study “timeless” topics that have always persisted through the years.

Unresearchable problems. Some research problems may not be answered adequately based on observed evidence alone, or using currently accepted methods and procedures. Such problems are best avoided. However, some unresearchable, ambiguously defined problems may be modified or fine tuned into well-defined and useful researchable problems.

Favored research methods. Many researchers have a tendency to recast a research problem so that it is amenable to their favorite research method (e.g., survey research). This is an unfortunate trend. Research methods should be chosen to best fit a research problem, and not the other way around.

Blind data mining. Some researchers have the tendency to collect data first (using instruments that are already available), and then figure out what to do with it. Note that data collection is only one step in a long and elaborate process of planning, designing, and executing research. In fact, a series of other activities are needed in a research process prior to data collection. If researchers jump into data collection without such elaborate planning, the data collected will likely be irrelevant, imperfect, or useless, and their data collection efforts may be entirely wasted. An abundance of data cannot make up for deficits in research planning and design, and particularly, for the lack of interesting research questions.