chapter 1
the nature of business
and management research

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Why study research?
Assume for the moment that you are the new head of the South European office of a Swedish machinery manufacturer. Your appointment makes you the fourth person to hold this post in just three years. Some of the sales and service staff, who have worked for the company for more than ten years, have packed in their jobs, and complaints from customers regarding poor after-sales service are on the increase. What will you do? How do you begin to think about how to solve this problem?

Here’s another decision-making scenario. You are talking with the head of the academic department of the subject you are studying. She chairs the committee that is responsible for selecting the textbook for the research methodology course. How should she begin to evaluate the committee’s options? Finally, the production of a thesis marks the end of your business studies course. A thesis requires more from you than just a comprehensive overview of the current literature related to your research topic. Theses that offer at least a small new contribution to our understanding of the issues investigated usually receive a better assessment. However, how do you set up a research project – that is, how do you come to a problem statement? And once you have a research problem and research questions, how will you come to answers to these research questions? Research methods provide you with ideas, instruments and models that demonstrate how to conduct sound research.

The study of research methods will provide you with the knowledge and skills you need to solve the problems and meet the challenges of a fast-paced decision-making environment. Business research may be defined as a systematic inquiry whose objective is to provide the information that will allow managerial problems to be solved. Business research courses recognize that students preparing to manage business, not-for-profit and public organizations – in all functional areas – need training in a disciplined process that will enable them to investigate and solve a research or management dilemma (i.e. any problem or opportunity that requires a management decision). Three factors have stimulated an interest in this scientific approach to decision-making:

1 the need for more and better information as decisions become more complex
2 the availability of improved techniques and tools to meet this need
3 the resulting information overload if discipline is not employed in the process.

The past two decades have seen dramatic changes in the business environment. Emerging from what is, historically, an economic role, the business organization has evolved in response to the social and political mandates of national public policy, explosive technology growth and continuing innovations in global communications. These changes have created new knowledge needs...
for the manager and new publics that should be considered when evaluating any decision. Other knowledge demands have arisen as a result of problems with mergers, trade policies, protected markets, technology transfers and macroeconomic savings-investment issues.

The current trend towards complexity has increased the risks associated with making business decisions, meaning that it is more important than ever to have a sound information base. Likewise, the complexity of the phenomena that scientists are investigating impedes our understanding of what is really happening. Rather than concluding that ‘all depends on almost everything’ we must strive for meaningful explanations. Below is a list of factors that characterize

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**Research and the valuation of corporate social responsibility**

Consumer magazines, such as *Which?* in the UK, *Test* in Germany and *Consumentengids* in the Netherlands, have a significant impact on consumers’ buying behaviour. It is common for companies whose products have received unsatisfactory marks in a consumer magazine test to withdraw these products from the market. Likewise, positive assessments of consumer organizations are often used in advertising to emphasize the superior quality of products. The classical tests conducted by independent consumer organizations evaluated the quality of products, and were often sub-divided into different categories, such as technical performance, durability, ease of use, safety and price.

Since 2002, consumer organizations have increasingly been introducing corporate social responsibility as an additional criterion to assess consumer products. Holger Brackeman, research director of Stiftung Warentest, the German consumer organization, comments on its decision to include ethical criteria in its test: ‘Our initiative has created either hope or fear that these social and environmental issues will gain extra weight in society if as major a player as Stiftung Warentest addresses them in a more concerted way.’

Most consumer magazines started to include ethical criteria as a response to requests from consumers. Rob Harrison, editor UK’s ethical consumer magazines, states that there is a general trend among consumers to request information regarding ethical issues. A common problem for all organizations testing consumer products is how to establish procedures for assessing corporate social responsibility. Some industry representatives seriously question the usefulness of such ethical information because of the methodological difficulties involved. Even consumer magazines acknowledge these methodological problems. Ms O’Brian of *Which?* mentions three. First, which products should one focus on: popular ones with high volumes (e.g. mobile phones), or those where it is well known that ethical issues are hardly considered (e.g. many textiles)? Second, how can we be sure that the information collected on products is reliable and verifiable, as many companies have not implemented procedures to collect information on corporate social responsibility. Third, how can consumer magazines balance the two objectives of providing simple and understandable guidance for their readers and providing a differentiated and detailed picture of the issues at hand.

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**References and further reading**

- [www.stiftung-warentest.de](http://www.stiftung-warentest.de)
- [www.consumentenbond.nl](http://www.consumentenbond.nl)
- [www.which.uk](http://www.which.uk)
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the complex business decision-making environment; each demands that managers and scientists have more and better information on which to base their decisions.

- There are more variables to consider in every decision.
- More knowledge exists in every field of management.
- Global and domestic competition is more vigorous, with many businesses downsizing in order to refocus on primary competences, reduce costs and make competitive gains.
- The quality of theories and models available to explain tactical and strategic results is improving.
- Government is continuing to show concern for all aspects of society, becoming increasingly aggressive in protecting these various publics.
- The explosive growth of company websites on the World Wide Web, e-commerce, and the availability of company publications via desktop and electronic publishing, have heralded the presence of extensive new arrays of information. Its quality, however, is not always impeccable.
- Workers, shareholders, customers and the general public are demanding to be included in company decision-making; they are better informed and more sensitive to their own interests than ever before.

To succeed in such an environment, we need to know how to identify high-quality information and how to recognize the solid, reliable research on which high-risk decisions can be based. Luckily, while the decision-making environment has become more complicated, business research tools have at the same time become more sophisticated and improvements in information technology have served to streamline the research process. Each of the factors listed below demonstrates how recent developments have affected the business research process.

- Organizations are increasingly practising data-mining – learning to extract meaningful knowledge from volumes of data contained within internal databases.
- Advances in computing technology have allowed businesses to create the architecture required for data warehousing – electronic storehouses where vast arrays of collected, integrated data are kept, ready for mining.
- The power and user-friendliness of today’s computers means that data may easily be analysed and used to deal with complex managerial problems.
- Quantitative analysis techniques take advantage of increasingly powerful computing capabilities.
- The communication and measurement techniques used in research have been enhanced.

As a researcher, you will need to know how to conduct such research. If you are to develop the skills required in this area, you will need to understand the scientific method as it applies to the managerial decision-making environment. That's why this book addresses your needs as an information processor. Throughout the text we give a slight emphasis to the perspective of an academic researcher or student, as we believe that most users of the text currently belong to these two groups. However, business decisions and research are also often conducted, or at least requested, by managers. By and large, academic researchers, students and managers encounter the same methodological problems while conducting business or management research, although the former often emphasize aspects other than the latter. As many of our users are currently students who will become managers in the near future, we will also address issues that pertain to research in a commercial rather than an academic setting.
What is research?
Having seen why research is a vital part of the business decision-making process, it’s time to look at just what research is. We’ll begin with a few examples of management problems that involve decision-making based on information-gathering. When you have read through each of these, you will be able to abstract the essence of research. How is it carried out? What can it do? What should it not be expected to do? As you read the four cases below, bear in mind the possible range of situations available for conducting business research, and think about how you might answer the following questions.

1 What is the decision-making dilemma facing the researcher or manager?
2 What must the researcher accomplish?

Air Swiss
You work for Air Swiss, an aviation company that is searching for new international partners. The senior vice president for development asks you to head a task force to investigate six companies that are potential candidates. You assemble a team composed of representatives from the relevant functional areas. Pertinent data are collected from public sources because of the sensitive nature of the project. You examine all of the following: company annual reports; articles in business journals, trade magazines and newspapers; financial analysts’ assessments; and company advertisements. Your team members then develop summary profiles of the candidate firms based on the characteristics gleaned from these sources. The final report highlights the opportunities and problems that acquisition of the target firm would bring to all areas of the business.

Akademiska Sjukhuset
You are the commercial manager of Akademiska Sjukhuset, a major academic hospital in Sweden. A prominent manufacturer of medical equipment has contacted you to ask whether you would be willing to purchase a new-generation MRI scanner, which uses magnetism, radio waves and a computer to produce images of body structure. The doctors’ committee at the hospital, to which you will need to make a recommendation, will have to decide on this question. If they choose to purchase the new scanner, they will also agree to test new applications for it and report back to the manufacturer on their experiences. In exchange for this they will get access to the latest technology at a significantly reduced price, and become a member of the manufacturer’s network of preferred hospital partners.

You begin your investigation by mining data from patient files to learn how your current MRI scanner is used and what kind of diagnoses it can be used for. You then consult other Swedish hospitals to find out how well equipped they are with MRI technology, and how many patients might, potentially, be treated in your hospital if you invest in the technology. You attempt to confirm your data with information from professional and association journals. Based on this information, you develop a profile that details the number of patients that could be treated, and the overheads and potential revenue that would be realized as a result of purchasing the new scanner.

ColorSplash
ColorSplash, a paint manufacturer, is having trouble maintaining profits. The owner believes inventory management is a weak area of the company’s operations. In this industry, the many paint colours, types of paint and container sizes make it easy for a firm to accumulate large inventories and still be unable to fulfil customer orders.

The owner asks you to make some recommendations. You look into the company’s present warehousing and shipping operations, and find excessive sales losses and delivery delays because of out-of-stock conditions. An informal poll of customers confirms your impression.
You suspect that the present inventory database and reporting system do not provide the prompt, usable information that is needed to allow appropriate production decisions to be made. Based on this supposition, you familiarize yourself with the latest inventory management techniques in a local college library. You ask the warehouse manager to take an accurate inventory and you review the incoming orders for the last year. In addition, the owner shows you the production runs for the last year and the method he uses to assess the need for a particular colour or paint type.

Modelling the last year of business using production, order and inventory management techniques, you select the method that, in theory, will provide the greatest profit. You run a pilot line using the new control methodology. After two months, the data show a much lower inventory and a higher order fulfilment rate. You recommend that the owner adopt the new method.

York College
You work for York College’s alumni association. It is eager to develop closer ties with its ageing alumni in order to encourage increased donation levels and to persuade older, non-traditional students to return to education and thus supplement enrolment numbers. The president’s office is considering the construction of a retirement community that is geared towards university alumni and asks your firm to assess the attractiveness of the proposal from an alumni viewpoint. Your director asks you to divide the study into four parts, as follows.

PHASE 1 First, you are to report on the number of alumni in the appropriate age bracket, the rate of new entries per year and the actuarial statistics for the group. This information will allow your director to assess whether the project is worth pursuing.

PHASE 2 Your early results reveal that there are sufficient alumni to make the project feasible. The next step in the study is to describe the social and economic characteristics of the target alumni group. You review gift statistics, analyse job titles, and assess home locations and values. In addition, you review files from the last five years to see how alumni responded when they were asked about their income bracket. When you have finished, you are able to describe the alumni group for your director.

PHASE 3 It is evident that the target alumni can easily afford to join a retirement community as proposed. The third phase of the study is to explain the characteristics of the alumni who would be interested in a university-related retirement community. For this phase, you engage the National Pensioners Convention (NPC) and a retirement community developer. In addition, you search for information on senior citizens from federal government sources.

From the developer you learn what characteristics of retirement community planning and construction are most attractive to retirees. From the NPC you learn about the main services and features that potential retirees look for in a retirement community. From government publications you become familiar with existing regulations and recommendations for operating retirement communities, and uncover a full range of descriptive information on the typical retirement community dweller.

You make an extensive report to both the alumni director and the university president. It covers the number of eligible alumni, their social and economic standing, and the characteristics of those who would be attracted by the retirement community.

PHASE 4 The report excites the college president. She asks for one additional phase to be completed. She needs to predict the number of alumni who would be attracted to the project so that she can adequately plan the size of the community. At this point, you call on the college
business school’s research methods class for help in designing a questionnaire for the alumni. By providing telephones and funding, you arrange for the class to conduct a survey among a random sample of the eligible alumni population. In addition, you have the class devise a second questionnaire for alumni who will become eligible in the next ten years.

Using the data collected, you can predict initial demand for the community and estimate growth in demand over the next ten years. You submit your final report to the director and the president.

**What is the dilemma facing the researcher or manager?**
The researcher’s/manager’s predicament is fairly well defined in the four cases described above. Let’s see how carefully you read and understood them.

- In the Air Swiss case, the senior vice president for development must make a proposal to the president, or possibly the board of directors, about which is the preferred international partner with which to join forces.
- In the Akademiska Sjukhuset case, the doctors in the group must decide whether to purchase the new-generation MRI scanner.
- In the ColorSplash case, the owner of the paint manufacturer must decide whether to implement a new inventory management system.
- At York College, the president must propose to the board of directors whether to fund the development of a retirement community.

How did you do? If you didn’t come to the same conclusions, re-read the cases before proceeding, to find out what you missed. Make sure you have a strong grasp of the process before you read on.

In real life, management dilemmas are not always so clearly defined. In the ColorSplash case, rather than pinpointing the problem as a simple one of inventory management, the paint manufacturer’s owner could have faced several, possibly intertwining, problems:

- a strike by employees that had an adverse effect on inventory delivery to retail and wholesale customers
- the development of a new paint formula that offers superior coverage but requires a hard-to-source ingredient in its manufacture, thereby affecting production rates
- a fire that destroyed the primary loading dock of the main shipping warehouse in Belgium
- the simultaneous occurrence of all three of these events.

As the research process begins with the manager’s decision-making task, it is of paramount importance to have an accurate definition of the dilemma; this, however, can often prove difficult. We will address this issue in Chapter 2.

**What must the researcher accomplish?**
The different types of study represented by the four cases can be classified as reporting, descriptive, explanatory or predictive. We’ll look at these in more detail now.

**REPORTING** At the most elementary level, a reporting study may be produced simply to provide an account or summation of some data, or to generate some statistics. The task may be quite simple and the data readily available. At other times, the information may be difficult to find. A reporting study calls for knowledge and skill in using information sources and dealing with their gatekeepers. Such a study usually calls for little in the way of inference or conclusion drawing.
In the Air Swiss case, the researcher needs to know what information should be assessed in order to value the company. In the study of management, this knowledge would primarily be acquired in courses on financial management, accounting and marketing.

Knowing the type of information needed, the researcher in the Air Swiss case identifies possible sources, like trade press articles and annual reports. Because of the possible effects of the evaluation of potential partners on the company’s stock prices, only public sources are used. Other reporting studies of a less sensitive nature might have the researcher interviewing source gatekeepers. In the York College case, for example, interviewing the director of a local retirement facility might have revealed other sources that could be included in the research. Such an expert is considered a gatekeeper.

Purists claim that reporting studies do not qualify as research, although data that are gathered carefully can have great value. Others argue that at least one form, investigative reporting, has a great deal in common with widely accepted qualitative and clinical research. A research design does not have to be complex, or require the use of inference, for a project to be labelled research.

**DESCRIPTIVE** A descriptive study tries to discover answers to the questions who, what, when, where and, sometimes, how. The researcher attempts to describe, or define, a subject, often by creating a profile of a group of problems, people or events. Such studies may involve the collection of data and an examination of the distribution and number of times the researcher observes a single event or characteristic ([this is known as a research variable](#)). They may also involve an assessment of the interaction of two or more variables.

In the Akademiska Sjukhuset case, the researcher must present data that reveal who is affiliated with the insurer, who uses managed healthcare programmes (both doctors and patients), general trends in the use of imaging technology in diagnosing illness or the severity of injury, and the relationship of patient characteristics, doctor referrals and technology use patterns.

Descriptive studies may or may not have the potential for drawing powerful inferences. Organizations that maintain databases of their employees, customers and suppliers (internal information) already have significant data that can be used to conduct descriptive studies. Yet many firms that have such data files do not mine them regularly in order to take advantage of the decision-making insight they might provide.

A major deficiency of descriptive studies based on existing data sources, however, is that they cannot explain why an event has occurred or why the variables interact in the way they do.

The descriptive study is popular in business research because of its versatility across disciplines. In not-for-profit corporations and other organizations, descriptive investigations have broad appeal to administrators and policy analysts for planning, monitoring and evaluating. In such contexts, ‘how’ questions address issues such as those related to quantity, cost, efficiency, effectiveness and adequacy.²

**EXPLANATORY** Academics have debated the relationship between the next two types of study – explanatory and predictive – in terms of which one should precede the other. Both types of research are grounded in theory, and theory is created to answer ‘why’ and ‘how’ questions. For our purposes, an explanatory study goes beyond description and attempts to explain the reasons for the phenomenon that the descriptive study has only observed.

Research that studies the relationship between two or more variables is also referred to as a correlational study. In an explanatory study, the researcher uses theories, or at least hypotheses, to account for the forces that caused a certain phenomenon to occur.

In the ColorSplash case, believing that the problem with paint stock-outs is the result of poor inventory management, the owner asks the researcher to detail warehousing and shipping
Conflicting conclusions

On 21 May 2001, a century-long industrial relationship was severed when Bridgestone/Firestone, Inc. announced that it would stop selling tyres to Ford. Firestone CEO John Lampe said that any relationship needed to be built on ‘trust and mutual respect’, and that Ford’s anticipated replacement of 13 million tyres – without just cause from Firestone’s point of view – showed an obvious lack of trust.

These two automobile industry giants, although party to the same crash data, came to very different conclusions. Firestone claimed its tyres failed at a higher than normal rate only when installed on Ford Explorers. Ford claimed that crashes involving Explorers were far more likely with Firestone tyres. Firestone’s Lampe stated, ‘Our analysis suggests that there is a significant safety concern with a substantial segment of Ford Explorers.’ He added that Ford ‘steadfastly refused to acknowledge those concerns’.

Were the National Highway Traffic Safety Administration (NHTSA) data incorrect? Did the companies examine significantly different insurance data? Were the conflicting conclusions incorrect? The answer to each of these questions is no.

Business research is conducted to enable decision-makers to make better decisions. Both companies needed to make decisions that would protect their brand equity and offer a buffer against wrongful death and injury lawsuits. Many believe that Firestone is fighting for its very survival; Ford’s situation is far less severe.

While, initially, GM reaffirmed its relationship with the tyre company (even naming Firestone its 2001 Supplier of the Year) and Nissan Motor expects to continue its relationship with Firestone, if they or other automotive companies choose to follow Ford’s lead, Firestone could crumble under the effects of such a divorce.

References and further reading

- www.firestone.com
- www.ford.com
processes. Had it stopped there this would be a descriptive study; but if problems in the processes can be linked with sales losses due to an inability to make timely deliveries to retail or wholesale customers, then an explanatory study will emerge. The researcher tests this hypothesis by modelling the last year of business using the relationship between processes and results.

**Predictive** If we can provide a plausible explanation for an event after it has occurred, it is desirable for us to be able to predict when and in what situations such an event might re-occur. A **predictive study**, the fourth type, is rooted as much in theory as in explanation.

National governments in Europe are always interested in economic predictions for the coming year, as a country’s economic situation largely determines the tax revenues it will receive, as well as likely government expenditure (e.g. on unemployment benefits). Economic research institutes, such as the CPB in the Netherlands, the DIW or IFO in Germany, and the research departments of banks, use complex theory-driven models to predict key economic figures (e.g. economic growth). The variables included in such models are – among many others – firms’ current investments in equipment, consumer confidence, currency exchange rates, and so on.

This type of study often calls for a high level of inference. Why, for example, would increasing consumer confidence stimulate economic growth in one year, while in other years the effect of consumer confidence is hardly detectable? The answer to such a question would be of great value in improving the models employed as well as future predictions. In business research, prediction is found in studies conducted to evaluate specific courses of action or to forecast current and future values.

Sometimes, we want to get an idea about how the future might look like but lack solid theories allowing such predictions. Other methods to predict the future include scenario models and expert surveys. In the former, the researcher works out different scenarios based on different assumptions on the course of key factors. For example, you might want to know how the market for private insurance will develop in China in the next 20 years. Your prediction will depend on your assumption of how many Chinese have sufficient income to be interested in such insurance. Expert surveys are mostly based on qualitative interviews with experts on a given issue and distilling the most likely from these expert opinions. Although these two latter models do not rely on an explicit theoretical model, the researcher and the experts questioned certainly work with implicit theories on which they base their assessment of the future.

The researcher is asked to predict for the York College president the success of the proposed retirement facility for alumni, based on the number of applications for residency the project will attract. This prediction will be based on the explanatory hypothesis that alumni frequent programmes and projects sponsored by the institution because of an association they maintain between their college experience and images of youthfulness, and mental and physical stimulation.

Finally, once we can explain and predict a phenomenon, we would like to be able to control it. Being able to replicate a scenario and dictate a particular outcome is the objective of **control**. In the York College case, if we assume that the college goes ahead with its retirement community and enjoys the success predicted, the president will feel encouraged to build a similar facility to serve another group of alumni and duplicate that success.

Control is a logical outcome of prediction. The complexity of the phenomenon and the adequacy of the prediction theory, however, are largely responsible for deciding success in a control study. At York College, if a control study were carried out to examine the various promotional approaches used with alumni to stimulate images of youthfulness, the promotional tactics that drew the largest number of alumni applications for residency could be identified. Once known, this knowledge could be used successfully with different groups of alumni **only if** the researcher could account for and control all other variables influencing the applications.
Is research always problem-solving based?

In the four cases detailed above, researchers were asked to respond to particular ‘problems’ that managers needed to solve. **Applied research** has a practical problem-solving emphasis, although the need for problem-solving is not always generated by a negative circumstance. Whether the ‘problem’ is negative, like rectifying an inventory system that is resulting in lost sales (as in the ColorSplash case) or, say, an opportunity to increase stockholder wealth through acquiring another firm, problem-solving plays a very important part in business research.

The problem-solving nature of applied research means that it is conducted in order to reveal answers to specific questions related to action, performance or policy needs. In this respect, all four of the case examples above appear to qualify as applied research. Pure, or basic, research is also problem-solving based, but in a different sense. It aims to solve perplexing questions (i.e. problems) of a theoretical nature that have little direct impact on action, performance or policy decisions.

**Pure research** or **basic research** in the business arena might involve a researcher for, say, an advertising agency who is studying the results of the use of coupons versus rebates as demand stimulation tactics, but not in a specific instance or in relation to a specific client’s product. In another pure research scenario, a researcher might study the influence on productivity of remuneration methods that pay according to a piece-work rather than a salary-plus-commission system. Both applied and pure research are, then, problem-solving based. Applied research is, however, directed much more to making immediate managerial decisions.

Some authorities equate research with basic or scientific investigations and would reject all four examples. History shows, however, that science typically has its roots in the pragmatic problems of real life. Interest in basic research comes much later, following the development of knowledge in a particular field. Research that is restricted to basic or pure research is too narrowly defined.

One respected author defines scientific research as a ‘systematic, controlled, empirical, and critical investigation of natural phenomena guided by theory and hypotheses about the presumed relations among such phenomena’. The terms ‘systematic’ and ‘controlled’ in this definition refer to the degree to which the observations are controlled and alternative explanations of the outcome are ruled out. The terms ‘empirical’ and ‘critical’ point to requirements for the researcher to test subjective beliefs against objective reality, and to leave the findings open to further scrutiny and testing. These qualities are what the author means by ‘scientific’. Whether all business research needs to be this stringent or should be ‘guided by theory and hypotheses about presumed relations’ is, however, debatable.

The classical concept of basic research does call for a hypothesis, but in applied research such a narrow definition omits at least two types of investigation that are highly valued. First, there is the exploratory study in which the investigator knows so little about the area of study that hypotheses have not yet emerged. An equally important area of study is that which purists call merely descriptive. The importance of descriptive research to business should be reinforced as follows.

> There is no more devastating condemnation that the self-designated theorist makes of the researcher than to label his work purely descriptive. There is an implication that associates purely descriptive research with empty-headedness; the label also implies that as a bare minimum every healthy researcher has at least one hypothesis to test, and preferably a whole model. This is nonsense.
>
> In every discipline, but particularly in its early stages of development, purely descriptive research is indispensable. Descriptive research is the stuff out of which the mind of man, the theorist, develops the units that compose his theories. The very essence of description is to name the properties of things: You may do more, but you cannot do less and still have description. The more adequate the description, the greater is the likelihood that the units derived from the description will be useful in subsequent theory building.
The answer to the question posed at the beginning of this section, ‘Is research always problem-solving based?’ is yes. Whether basic or applied, simple or complex, all research should provide an answer to some question. If managers always knew what was causing problems or offering opportunities in their realm of responsibility, there would be little need for applied research, pure research or basic research; intuition would be all that was necessary to make effective decisions.

Any of the four types of study – reporting, descriptive, explanatory or predictive – can properly be called research. We also can conclude from the various examples that we have seen that research is a systematic inquiry aimed at providing information to solve managerial problems. This defines the basic requirements that any effort must meet in order to be called research.

All four cases match this definition, but they suggest different stages of scientific development. A rough measure of the development of science in any field is the degree to which explanation and prediction have replaced reporting and description as research objectives. By this standard, the development of business research is in a comparatively formative stage.

What makes good research?

Good research generates dependable data, which is derived through practices that are conducted professionally and that can be used and relied upon. In contrast, poor research is carelessly planned and conducted, resulting in data that we can’t trust, i.e. we cannot be sure whether the results give an appropriate account of the reality and consequently we cannot base policy advice or any business decisions on these results. Good research follows the structure of the scientific method. Several defining characteristics of the scientific method are listed in Exhibit 1.1 and below, where the managerial dimensions of each are discussed.

The nine criteria summarized in Exhibit 1.1 together make up desirable, decision-orientated research. They are especially useful guidelines for managers who are performing research themselves. This is because they create barriers that prevent the researcher from adjusting his or her findings to meet their desired ends rather than allowing them to reflect reality.

**EXHIBIT 1.1 WHAT ACTIONS GUARANTEE GOOD RESEARCH?**

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<thead>
<tr>
<th>Characteristics of research</th>
<th>How can researcher achieve it?</th>
<th>Where to find out more</th>
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<tbody>
<tr>
<td>1 Purpose clearly defined</td>
<td>In applied research, the researcher distinguishes between symptom of organization’s problem, the manager’s perception of the problem and the research problem; in pure research, it is also wise to clearly separate the research dilemma addressed and the research problem actually investigated</td>
<td>Chapter 2</td>
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<tr>
<td>2 Research process detailed</td>
<td>Researcher provides complete research proposal</td>
<td>Chapter 2</td>
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<td>3 Research design thoroughly planned</td>
<td>Exploratory procedures are outlined with constructs defined</td>
<td>Chapters 2, 6–10</td>
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<td>Sample unit is clearly described, along with sampling methodology</td>
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<td></td>
<td>Data collection procedures are selected and designed</td>
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### Section 1: Essentials of Research

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<th>Characteristics of research</th>
<th>How can researcher achieve it?</th>
<th>Where to find out more</th>
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<tr>
<td>4 High ethical standards applied</td>
<td>Safeguards are in place to protect study participants, organizations, clients and researchers</td>
<td>Chapter 3</td>
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<td></td>
<td>Recommendations do not exceed the scope of the study</td>
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<td>The study’s methodology and limitations sections reflect researcher restraint and concern for accuracy</td>
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<td>5 Limitations frankly revealed</td>
<td>Desired procedure is compared with actual procedure in report</td>
<td>Chapters 6, 13</td>
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<td></td>
<td>Desired sample is compared with actual sample in report</td>
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<td>Impact on findings and conclusions is detailed</td>
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<td>6 Adequate analysis for decision-maker’s needs</td>
<td>Sufficiently detailed findings are tied to collection instruments</td>
<td>Chapters 14–18</td>
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<td>7 Findings presented unambiguously</td>
<td>Findings are clearly presented in words, tables and graphs</td>
<td>Chapters 13–18</td>
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<td></td>
<td>Findings are logically organized to facilitate reaching a decision about the manager’s problems</td>
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<td></td>
<td>Executive summary of conclusions is outlined</td>
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<td></td>
<td>Detailed table of contents is tied to the conclusions and findings presentation</td>
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</tr>
<tr>
<td>8 Conclusions justified</td>
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1. **Purpose clearly defined**

The purpose of the research – the problem involved or the decision to be made – should be clearly defined and sharply delineated in a form that is as unambiguous as possible. Getting it down in writing is valuable even in instances where the decision-maker and researcher are the same person. Any statement of the decision or problem should include its scope, its limitations, and the precise meanings of all words and terms significant to the research. Failure of the researcher to do this adequately may raise legitimate doubts in the minds of research report
readers as to whether the researcher has sufficient understanding of the problem to make a sound proposal for action.

2. Research process detailed
The research procedures used should be described in sufficient detail to permit another researcher to repeat the research (it should be replicable). Except when secrecy is imposed, research reports should reveal with candour the sources of the data and the means by which they were obtained. Omission of significant procedural details makes it difficult, or even impossible, to estimate the validity and reliability of the data, and justifiably weakens the confidence of the reader in the research itself as well as any recommendations based on the research.

3. Research design thoroughly planned
The procedural design of the research should be planned carefully to yield results that are as objective as possible. When sampling of a population is involved, the report should include evidence concerning the degree of representativeness of the sample. A survey of opinions or recollections ought not to be used when more reliable evidence is available from documentary sources or by direct observation. Bibliographic searches should be as thorough and complete as possible. Experiments should have satisfactory controls. Direct observations should be recorded in writing as soon as possible after the event. Efforts should be made to minimize the influence of personal bias in selecting and recording data.

4. High ethical standards applied
Researchers often work independently and have significant latitude in designing and executing research projects. A research design that includes safeguards against causing mental or physical harm to participants and that makes data integrity a first priority should be valued highly. Ethical issues in research reflect important moral concerns about the practice of responsible behaviour in society. Ethical research issues are discussed at length in Chapter 3.

Researchers frequently find themselves precariously balancing the rights of their subjects against the scientific dictates of their chosen method. When this occurs, they have a responsibility to guard the welfare of the participants in the studies and also the organizations to which they belong, their clients, their colleagues and themselves. Careful consideration must be given to those research situations in which there is the possibility of physical or psychological harm, exploitation, invasion of privacy and/or loss of dignity. The research requirements must be weighed against the potential for adverse effects. Typically, you will be able to redesign a study, but on occasion you will not. As a researcher, you should be prepared for this dilemma.

5. Limitations frankly revealed
The researcher should report, with complete frankness, any flaws in procedural design, and estimate their effect on the research findings. There are few perfect research designs. Some of the imperfections may have little effect on the validity and reliability of the data; others may invalidate them entirely. A competent researcher should be sensitive to the effects of imperfect design, and his or her experience in analysing the data should provide a basis for estimating their influence. As a decision-maker, you should question the value of a piece of research that reports no limitations.

6. Adequate analysis for decision-maker’s needs
Analysis of the data should be extensive enough to reveal its significance, and the methods of analysis used should be appropriate. The extent to which this criterion is met is frequently a good measure of the competence of the researcher. Adequate analysis of the data is the most
difficult phase of research for the novice. The validity and reliability of data should be checked carefully. The data should be classified in ways that assist the researcher in reaching pertinent conclusions and that clearly reveal the findings that have led to those conclusions. When statistical methods are used, the probability of error should be estimated and the criteria of statistical significance applied.

7. Findings presented unambiguously
Some evidence of the competence and integrity of the researcher may be found in the report itself. For example, language that is restrained, clear and precise, assertions that are carefully drawn and hedged with appropriate reservations, and an apparent effort to achieve maximum objectivity tend to give the decision-maker a favourable impression of the researcher. Generalizations that outrun the evidence on which they are based, exaggerations and unnecessary verbiage, however, tend to have the opposite effect. Such reports are not valuable. The presentation of data should be comprehensive, easily understood by the decision-maker, and organized so that the decision-maker can readily locate critical findings.

What are the consequences of faking data in research?
Is it more than an ethical dilemma if you falsify the description of your methodology or if you modify your sampling plan? These are ethical and procedural issues that researchers, even famous ones, face. In its December 2001 issue, FastCompany asked author, consultant and motivational speaker Tom Peters to revisit the writing of In Search of Excellence, the 1982 best-selling business title. In his confession #3, Peters is quoted as saying that he ‘faked the data’ that resulted in the eight underlying principles – principles that guided American business for much of the next decade.

Rather than evolving from a large study of businesses, where each was selected based on its performance metrics (a probability study), Peters switched the research design and he, along with partner and co-author Robert Waterman, asked McKinsey colleagues and other contacts to identify ‘cool’ companies (a non-probability, judgement sample). They conducted detailed personal interviews with contacts in those initial 62 companies, then reduced the list to 43 by a post-interview review of performance metrics.

Peters, in confession #7, admits that he missed some of the emerging ‘excellence’ factors because they were ‘too superficial to make an impact’. Some of the things his study missed were early signs of the growing influence of information technology and the importance that speed would come to have in business.

Do you think that his confession diminishes the importance of the results?

References and further reading
- www.fastcompany.com
- www.mckinsey.com
- www.tompeters.com
8. Conclusions justified
Conclusions should be limited to those for which the data provide an adequate basis. Novice researchers are often tempted to broaden the basis of induction by including personal experiences and their own interpretations – which are not, of course, subject to the controls under which the research data were gathered. Equally undesirable is the all-too-frequent practice of drawing conclusions from a study of a limited population and applying them universally. Some researchers may also be tempted to rely too heavily on data collected in a prior study and use it in the interpretation of a new one. This sometimes occurs among research specialists who confine their work to clients in a small industry. These actions tend to decrease the objectivity of the research and undermine readers’ confidence in its findings. Good researchers always specify the conditions under which their conclusions are valid.

9. Researcher’s experience reflected
Greater confidence in the research is warranted if the researcher is experienced, has a good reputation in the research field and is a person of integrity. Were it possible for the reader of a research report to obtain sufficient information about the researcher, this criterion would perhaps be one of the best bases for judging the degree of confidence a piece of research warrants and the value of any decision based upon it. For this reason, the research report should always contain information about the qualifications of the researcher.

Research philosophies
We introduced the importance of thinking about what research is in a rather pragmatic way. However, how research should be conducted is embedded in the broader philosophies of science. Research is based on reasoning (theory) and observations (data or information). How observations and reasoning are related to each other is a still ongoing and old philosophical debate on the development of knowledge. Although many researchers conduct sound research without a thought for underlying philosophical considerations, some knowledge of research philosophies is beneficial for you as a researcher as it helps to clarify the research design and facilitates the choice of an appropriate one. Furthermore, understanding the basic assumptions of research philosophies can enable researchers to reach designs beyond their past experience. In the following, we provide an overview of the two most distinguished research philosophies, positivism and interpretivism (also called phenomenology). Between these two positions various other research philosophies exist, relying on some principles of positivism or interpretivism, while relaxing others and incorporating principles of the opposing philosophy. The most notable of these is realism, which will be discussed later.

Looking at the often fierce debates between positivists and interpretivists, one might get the impression that research is either conducted on planet ‘positivarium’ or on planet ‘interpretivarium’, and research has to be embedded in one philosophy. Using the survey methodology seems to imply a deductive approach rooted in positivism, and an ethnographic observational study using inductive reasoning seems to follow interpretivism. By and large, such classifications are reasonable, but research practice shows that researchers rarely subscribe consistently to one philosophy and, in management research in particular, a more pragmatic view prevails.

**Positivism**
Positivism is a research philosophy adopted from the natural sciences. Its three basic principles are:

1. the social world exists externally and is viewed objectively
2. research is value-free
3. the researcher is independent, taking the role of an objective analyst.

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Auguste Comte, an early proponent of positivism, said that 'all good intellects have repeated, since Bacon's time, that there can be no real knowledge but that which is based on observed facts'. According to positivism, knowledge develops by investigating the social reality through observing objective facts. This view has important implications for the relationship between theory and observations, as well as for how research is conducted. Theory development starts with hypothesizing fundamental laws and deducing what kind of observations support or reject the theoretical predictions of the hypotheses. Consequently, the research process starts with identifying causalities forming the base of fundamental laws. Then research is conducted to test whether observations of the world indeed fit the derived fundamental laws and to assess to what extent detected causalities can be generalized (i.e. are applicable to the whole world).

Positivism implies the following assumptions.

- The social world is observed by collecting objective facts.
- The social world consists of simple elements to which it can be reduced.

A scientist following this research tradition believes (assumes) that observable facts are objective, because they are external, i.e. we cannot influence them, and research is conducted value-free. This implies that different researchers observing a social phenomenon, such as the takeover battle between two firms, arrive at the same facts describing the social world. As a consequence, concepts need to be operationalized to allow a quantitative measurement of the facts. Further, the social world can be reduced to simple elements. Distilling its elements and reducing them to fundamental laws is the best way to investigate a phenomenon. This explains why studies following the positivism approach often single out one explanation in order to understand a phenomenon and deliberately neglect other aspects, which are often investigated in separate studies.

**Interpretivism**

Unlike positivists, interpretivists hold the view that the social world cannot be understood by applying research principles adopted from the natural sciences and propose that social sciences require a different research philosophy. The basic principles of interpretivism are:

- the social world is constructed and is given meaning subjectively by people
- the researcher is part of what is observed
- research is driven by interests.

Interpretivists argue that simple fundamental laws are insufficient to understand the whole complexity of social phenomena. More important, however, they claim that an objective observation of the social world is impossible, as the social world has a meaning for human beings and is constructed by intentional behaviour and actions. Knowledge is developed and theory built through developing ideas inducted from the observed and interpreted social constructions. The researchers' emphasis on making sense of what is happening sometimes even generates surprising findings beyond the current common scientific knowledge. Interpretivists attempt to understand subjective realities and to offer interpretative explanations, which are meaningful for the participants of the research. The involvement of the researcher in the research is most apparent in action research (see Chapter 8), where the researchers engage in active collaboration with participants to address real-life problems in a specific context, and aim to offer and implement feasible solutions to the problem.

Interprevists also reject the notion that research is value-free. As researchers offer an interpretation of how people interpret the social world, the researchers' interpretation is also socially constructed, reflecting their motives and beliefs. As Habermas stated, human interests not only channel our thinking, but also guide how we investigate the world (i.e. which questions we ask),
Interpretivism implies the following assumptions.

- The social world is observed by seeing what meanings people give to it and interpreting these meanings from their viewpoint.
- Social phenomena can only be understood by looking at the totality.

Gathering and measuring facts will not disclose the essence of a social phenomenon, rather researchers need to explore why people have different experiences and to understand how these differences result in the different constructions and meanings people give to the social world. Interpretivists research social phenomena by making sense of how people interpret the social world. This requires the researcher to dig into the processes of subjective interpretation, acknowledging the specific motivations and interests of the participants. Compared to natural phenomena, social phenomena are characterized by a high complexity and are often unique, as they result from multiple circumstances constructed by many individuals. This means that interpretivism does not attach a great deal of importance to the generalizability of findings. The world, and especially the business world, is constantly changing and what seemed sensible three years ago may not hold at all now. Hence, in an ever changing world, generalization, even over short periods of time, becomes questionable.

Realism
Realism is a research philosophy sharing principles of positivism and interpretivism. Like positivism, its exponents believe that social sciences can rely on the research approach dominant in the natural sciences. More specifically, it accepts the existence of a reality independent of human beliefs and behaviour. However, it also concedes that understanding people and their behaviour requires acknowledgement of the subjectivity inherent to humans. In the realists’ view, there are social processes and forces beyond the control of humans, which affect our beliefs and behaviour. These processes and forces operate at the macro level. At the micro level (i.e. at the level of individual human beings), subjective individual interpretations of reality are important for a full understanding of what is happening. Still, most realists would accept that these subjective interpretations are not unique and that people share similar interpretations, partly because the external forces at the macro level influence everyone. Thus, research requires the identification of external factors describing general forces and processes influencing humans, as well as the investigation of how people interpret and give meaning to the setting they are situated in. Critical realism, a branch of realism, recognizes the existence of a gap between the researcher’s concept of reality and the ‘true’ but unknown reality. This implies that research is not value-free, and is conducted within a broader framework based on our current knowledge and concept of reality.

Research implications of positivism and interpretivism
The opposing stances taken by positivists and interpretivists are summarized in Exhibit 1.2. These differences in basic principles and assumptions have several implications for how researchers should conduct research. In the following, we will discuss how the two research philosophies affect research design.

Positivism starts from the idea that the world can be described by objective facts, which are then investigated. Therefore, one needs to assess whether observations are indeed objective facts. The constructs used are operationalized to ensure that two researchers observing the same phenomenon measure it in the same way. In practice, constructs are often operationalized in quantitative terms, as representing facts using numbers facilitates comparisons. The
interpretivist is interested in subjective meanings and interpretations of phenomena to detect what is happening in a specific situation. As each observation is subjective he or she relies ide-
ally on multiple sources and different methods to collect information on the phenomena. An example will serve to illustrate this.

Assume company performance is an essential aspect of the phenomena investigated. A study following the positivistic philosophy will ideally use a set of quantitative indicators reflecting performance, such as profit, sales, market share, growth or a relative measure such as return on assets. Interpretivists might even use financial key indicators from annual reports, but they would put more emphasis on subjective assessments of performance by management and employees. These subjective assessments can result in a quite different picture of the performance than financial indicators suggest and can even provide hints as to why a firm is or is not doing well.

A common study structure in the positivistic tradition is that researchers investigate a research problem by testing whether theoretically derived hypotheses hold for the situations investigated. If the objective facts support the hypothesis, the underlying fundamental laws are applicable and their validity is enforced. The value of the research usually increases with the generalizability of the findings, because a detected relationship, which cannot be linked to other similar circumstances, does not qualify as a fundamental law. This calls for large sample sizes to ensure that the findings based on the sample investigated represent the whole population. Interpretivistic studies follow a different structure. They offer a thick and rich description of the investigated phenomena, which is interpreted to understand what is happening. As they claim that generalization is of minor importance, as discussed above, smaller sample sizes (often just one) are sufficient.

A ‘perfect’ research study would combine the positivistic emphasis on large sample sizes with the thick description of an interpretivistic study. However, a thick description and a large sample size is not feasible and, more importantly taking the arguments above, not necessary. Still this difference in emphasis points to a general prerequisite of good research, as thick description and sample size have a substitutive relation, as shown in Exhibit 1.3. Good research not only
exists in extreme forms, but is much more often an intelligent combination of the two. Good research operates on a line between the white and the light blue area: moving too much into the blue area is, even if feasible, not efficient. Using a research design far away from the optimal line and in the white area is not sufficient to gain insight into what is happening. If your study is based on just a few cases and the information you collected on each case does not exceed what is usually obtained in large-scale surveys, your research has nothing of interest to offer. In the next section we will discuss how you decide what position on the optimal line you wish to occupy.

Choosing a research philosophy to be used

Characteristic of scientific research, whether it is a master’s thesis, a dissertation or a large-scale government-sponsored research programme, is the inclusion of theory. The place where you introduce theory can differ. You may start with theory in order to test it or solve a theoretical contradiction, or you may close with theoretical considerations drawn from your observations. The position, or role, of theory in your research is directly linked to two different reasoning approaches: deduction and induction.

DEDUCTION

Deduction is a form of inference that purports to be conclusive – that is, the conclusion must necessarily follow from the reasons given. These reasons are said to have led to the conclusion and therefore represent proof. This form of argument calls for a stronger link between reasons and conclusions than is found in induction. For a deduction to be correct, it must be both true and valid:

- premises (reasons) given for the conclusion must agree with the real world (true)
- the conclusion must necessarily follow from the premises (valid).

A deduction is valid if it is impossible for the conclusion to be false if the premises are true. Logicians have established rules by which we can judge whether a deduction is valid. Conclusions are not logically justified if one or more premise are untrue or the argument form is invalid. A conclusion may still be a true statement, but for reasons other than those given. Consider, for example, the following simple deduction.
All regular employees can be trusted not to steal. \(\text{[Premise 1]}\)
John is a regular employee. \(\text{[Premise 2]}\)
John can be trusted not to steal. \(\text{[Conclusion]}\)

If we believe that John can be trusted, we might think this is a sound deduction. However, this conclusion cannot be accepted as a sound deduction unless the argument form is valid and the premises are true. In this case, the form is valid and premise 2 can easily be confirmed. However, many may challenge the sweeping premise that ‘All regular employees can be trusted not to steal.’ While we may believe that John will not steal, such a conclusion is a sound deduction only if both premises are accepted as true. If one premise fails the acceptance test, then the conclusion is not a sound deduction. This is so even if we still have great confidence in John’s honesty. Our conclusion, in this case, must be based on our confidence in John as an individual rather than on a general premise that all regular employees are honest. On reflection, it should be apparent that a conclusion that results from deduction is in a sense already ‘contained in’ its premises.\(^{10}\)

**INDUCTION**

Inductive argument is radically different from the deductive type. It does not have the same strength of relationship between reasons and conclusions. To induce something is to draw a conclusion from one or more particular facts or pieces of evidence. The conclusion explains the facts, and the facts support the conclusion.

To illustrate, suppose your firm spends €1 million on a regional promotional campaign and sales do not increase. This is a fact: sales did not increase during or after the promotional campaign. Under such circumstances we might ask, ‘Why didn’t sales increase?’

One likely answer to this question is the conclusion that the promotional campaign was poorly executed. This conclusion is an induction because we know from experience that regional sales should go up during a promotional event. We also know that if the promotion is poorly executed, sales will not increase. The nature of induction, however, is that the conclusion is only a hypothesis. It is one explanation, but there are others that fit the facts just as well. For example, each of the following hypotheses might explain why sales did not increase.

- Regional retailers did not have sufficient stock to fill customer requests during the promotional period.
- A strike by the employees at the haulage firm used prevented stock from arriving in time for the promotion to be effective.
- A serious hurricane caused all our retail locations in the region to be closed for ten days during the promotion.

This example illustrates the essential nature of inductive reasoning. The inductive conclusion is an inferential jump beyond the evidence presented – that is, although one conclusion explains the fact that there was no sales increase, other conclusions can also explain this fact. It may even be the case that none of the conclusions we advanced correctly explains the failure of sales to increase.

Let’s look at another example. Consider the situation of Tracy Nelson, a salesperson at the Square Box Company. Tracy has one of the poorest sales records in the company. Her unsatisfactory performance prompts us to ask the question, ‘Why is she performing so poorly?’ From our knowledge of Tracy’s sales practices, the nature of box selling and the state of the market, we might conclude (hypothesize) that her problem is that she makes too few sales calls per day to build a good sales record. Other hypotheses might also occur to us on the basis of available evidence. These hypotheses include the following.

- Tracy’s territory does not have the market potential of other territories.
- Tracy’s sales-generating skills are so poorly developed that she is not able to close sales effectively.
Tracy does not have the authority to lower prices and her territory has been subject to intense price-cutting by competing manufacturers, causing her to lose many sales to competitors. Some people just cannot sell boxes, and Tracy is one of those people.

Each of the above hypotheses is an induction we might base on the evidence of Tracy’s poor sales record, plus some assumptions or beliefs we hold about her and about the selling of boxes. All of them have some chance of being true, but we would probably have more confidence in some than in others. All require further confirmation before they gain our confidence. Confirmation comes with more evidence. The task of research is largely to:

- determine the nature of the evidence needed to confirm or reject hypotheses, and
- design methods by which to discover and measure this other evidence.

COMBINING INDUCTION AND DEDUCTION Induction and deduction are used in research reasoning in a sequential manner. John Dewey describes this process as the double movement of reflective thought.\(^\text{11}\) Induction occurs when we observe a fact and ask, ‘Why is this?’ In answer to this question, we advance a tentative explanation (hypothesis). The hypothesis is plausible if it explains the event or condition (fact) that prompted the question. Deduction is the process by which we test whether the hypothesis is capable of explaining the fact.

1 You promote a product but sales don’t increase. (Fact 1)
2 You ask the question, ‘Why didn’t sales increase?’ (Induction)
3 You infer a conclusion (hypothesis) to answer the question: ‘The promotion was poorly executed’. (Hypothesis)
4 You use this hypothesis to conclude (deduce) that the sales will not increase during a poorly executed promotion. You know from experience that ineffective promotion will not increase sales. (Deduction 1)

This process is illustrated in Exhibit 1.4.

This example, an exercise in circular reasoning, indicates that one must be able to deduce the initiating fact from the hypothesis advanced to explain that fact. A second critical point is also illustrated in this exhibit: to test a hypothesis, one must be able to deduce from it other facts.

EXHIBIT 1.4 WHY DIDN’T SALES INCREASE?
that can then be investigated. This is what classical research is all about. We must deduce other specific facts or events from the hypothesis and then gather information to see if the deductions are true. In this example, we deduce the following.

5 A well-executed promotion will result in increased sales. (Deduction 2)
6 We run an effective promotion and sales increase. (Fact 2)

How would Dewey’s ‘double movement of reflective thought’ work when applied to Tracy Nelson’s problem? The process is illustrated in Exhibit 1.5. The initial observation (fact 1) leads to hypothesis 1: that Tracy is lazy. We deduce several other facts from the hypothesis. These are shown as fact 2 and fact 3. We use research to find out if fact 2 and fact 3 are true. If they are found to be true, they confirm our hypothesis. If they are not, our hypothesis is not confirmed, and we must look for another explanation.

In most research, the process is more complicated than these simple examples suggest. For instance, we often develop multiple hypotheses by which to explain the phenomenon in question. Then we design a study to test all the hypotheses at once. Not only is this more efficient, but it is also a good way to reduce the attachment (and potential bias) of the researcher to any given hypothesis.

**Reflective thought and the scientific method**

Induction and deduction, observation and hypothesis testing can be combined in a systematic way to illustrate the scientific method. The ideas that follow, originally suggested by Dewey and others for problem-solving analysis, represent one approach to assessing the validity of conclusions about observable events. They are particularly appropriate for researchers whose conclusions depend on empirical data.\(^\text{12}\) The researcher:

- encounters a curiosity, doubt, barrier, suspicion or obstacle
- struggles to state the problem – asks questions, contemplates existing knowledge, gathers facts, and moves from an emotional to an intellectual confrontation of the problem
- proposes hypotheses to explain the facts that are believed to be logically related to the problem
- deduces outcomes or consequences of the hypotheses – attempts to discover what happens if the results are (i) the opposite to those predicted or (ii) support the expectations
- formulates several rival hypotheses

**EXHIBIT 1.5 WHY IS TRACY NELSON’S PERFORMANCE SO POOR?**

| Fact 1: Tracy has a poor performance record | Induction |
| Fact 2: Tracy is regularly late to work | Hypothesis: Tracy is lazy |
| Fact 3: Tracy makes fewer calls per day than the average salesperson | Deduction: Laziness results in excessive tardiness |
| | Deduction: Laziness results in fewer customer calls per day |

\(^{12}\) The researcher:
devises and conducts a crucial empirical test with various possible outcomes, each of which selectively excludes one or more hypotheses.

draws a conclusion – an inductive inference – based on acceptance or rejection of the hypotheses.

feeds information back into the original problem, modifying it according to the strength of the evidence.

Eminent scientists who claim there is no such thing as the scientific method, or do not apply it overtly in their work, caution researchers about using template-type approaches. They are right to do so, and it should be added that the ideas presented in this book are highly interdependent, not sequentially fixed and may be expanded upon or eliminated according to the nature of the problem and the perspective from which it is viewed. Nevertheless, novice researchers should understand that research, when conducted scientifically, is most definitely a process.

The research process that explores the relationship between reflective thought and scientific method is described in detail in Chapter 3.

The scientific attitude

If the tools of thinking are the ‘mind’ of science, then the scientific attitude is its spirit. The scientific attitude unleashes the creative drive that makes discovery possible. The stories of scientists involved in some of the most spectacular discoveries of the twentieth century – Crick, Watson, Pauling and others – are ones of imagination, intuition, curiosity, suspicion, anguish, self-doubt and the urge to know. Such predispositions are not only, however, the preserve of the natural scientist. All researchers exercise imagination in the discovery process, in capturing the most essential aspect of a problem or in selecting the technique that will reveal a phenomenon in its most natural state.

Curiosity in its many forms has long characterized persistent efforts to understand the relationship between productivity and worker satisfaction. Starting first with the Hawthorne studies, it was thought that employee satisfaction improved productivity. Later research did not bear this out, and the second general conclusion was that satisfaction and productivity were not directly connected since the relationship was affected by a number of other variables. Currently, it is believed that satisfaction is sought for reasons not consistently related to work, and that productivity varies from simple to challenging tasks.

Many contextual variables are now viewed as essential to understanding the original relationship. Over 30 years elapsed while this research was being sorted out. The curiosity needed to ask questions, together with the passion not to let go and an unwillingness to just accept existing answers, sustained these researchers through periods of failure and self-doubt.

Thomas Kuhn, writing in *The Structure of Scientific Revolutions*, has also addressed the question of why scientists attack their problems with such passion and devotion. Scientific inquiry, he says, attracts people for a variety of motives. Among them are the desire to be useful, the excitement of exploring new territory, the hope of finding order, and the drive to test established knowledge. From applied researchers addressing a manager’s need to academicians fascinated with the construction of grand theories, the attitude of science is the enabling spirit of discovery.

Understanding theory: components and connections

When we do research, we seek to discover what we need to know in order to understand, explain and predict phenomena. We might want to answer the question ‘What will employees’ reaction be to the new flexible work schedule?’ or ‘Why did the stock market price surge higher when all normal indicators suggested it would go down?’ When dealing with such questions, we must
agree on definitions: which employees, what kind of reaction, what are the normal indicators? To
do this requires the use of concepts, constructs and definitions. These components, or building
blocks, of theory are reviewed in this section.

Later in this chapter, and in Section 3 of this book, we will use variables and hypotheses to
make statements and propose tests for the relationships expressed in our research questions.

**Concepts**

To understand and communicate information about objects and events, there must be some
common ground on which to do it. Concepts serve this purpose. A concept is a generally
accepted collection of meanings or characteristics associated with certain events, objects, con-
ditions, situations and behaviours. Classifying and categorizing objects or events that have
common characteristics beyond any single observation create concepts. When you think of a
spreadsheet or a warranty card, what comes to mind is not a single instance but collected mem-
ories of all spreadsheets and warranty cards abstracted to a set of specific and definable
characteristics.

We abstract such meanings from reality and use words as labels to designate them. For
example, we see a man go by and acknowledge that he is running, walking, skipping, crawling
or hopping. These movements all represent concepts. We have also abstracted certain visual
elements by which we identify that the moving object is an adult male, rather than an adult
female or a truck or a horse. We use a host of concepts in our everyday thinking, conversing and
other activities.

**SOURCES OF CONCEPTS** Concepts that are in frequent and general use have been developed
over time through shared usage. We have acquired them through personal experience. If we
lived in another society, we would hold many of the same concepts (though in a different lan-
guage). Some concepts, however, are unique to a particular culture and are not readily
translated into another language.

Ordinary concepts make up the bulk of communication even in research, but we will often run
into difficulties when trying to deal with an uncommon concept or a newly advanced idea. One
way to handle this problem is to borrow from other languages or areas (for example, gestalt
psychology) or from other fields (for example, impressionism, say, from art). The concept of
gravitation, for instance, has been borrowed from physics and used in marketing in an attempt
to explain why people shop where they do. The concept of ‘distance’ is used in attitude measu-
rement to describe the degree of variability between the attitudes of two or more people; the term
‘threshold’ is used to describe a concept in perception studies; while ‘velocity’ is a term bor-
rrowed by the economist from the physicist.

Borrowing is not always practical, though, so we sometimes need to adopt new meanings for
words (i.e. make a word cover a different concept) or develop new labels (words) for concepts.
The recent broadening of the meaning of the term ‘model’ is an example of the first instance;
the development of concepts such as sibling and status stress are examples of the second.

When we adopt new meanings or develop new labels, we begin to develop a specialized jargon
or terminology. Researchers in medicine, the physical sciences and related fields frequently use
terms that are unintelligible to outsiders. Jargon no doubt contributes to the efficiency of com-
munication among specialists, but it tends to exclude everyone else.

**THE IMPORTANCE OF CONCEPTS TO RESEARCH** Concepts are basic to all thought and
communication, yet in everyday use we pay scant attention to the problems encountered in their
use. In research, special problems grow out of the need for concept precision and inventiveness.
We design hypotheses using concepts. We devise measurement concepts by which to test these
hypothetical statements. We gather data using these measurement concepts. We may even invent new concepts to express ideas. The success of research hinges on:

- how clearly we conceptualize, and
- how well others understand the concepts we use.

For example, when we survey people on the question of tax equity, the questions we use need to tap faithfully the attitudes of the respondents. Attitudes are abstract, yet we must attempt to measure them using carefully selected concepts.

The challenge is to develop concepts that others will clearly understand. We might, for example, ask respondents for an estimate of their family’s total income. This may seem to be a simple, unambiguous concept, but we will receive varying and confusing answers unless we restrict or narrow the concept by specifying, say:

- time period (weekly, monthly or annually)
- fixed or variable income
- before or after tax
- head of family only or all family members
- salary and wages only, or also include dividends, interest and capital gains
- income in kind, such as living rent-free and employee discounts.

PROBLEMS IN CONCEPT USE

The use of concepts presents difficulties that are accentuated in a research setting. First, people differ in the meanings they include under any particular label. This problem is so great in normal human communication that we often see cases where, although people use the same language, they do not understand each other. We may all agree to the meaning of concepts such as dog, table, electric light, money, employee and wife. We might encounter more difficulty, however, when we communicate concepts such as household, retail transaction, dwelling unit, regular user and debit. Still more challenging are concepts that are familiar but not well understood, such as leadership, motivation, personality, social class and fiscal policy.

Personality, for example, has been defined in the research literature in more than 400 ways. Although this may seem extreme, writers are not able to express the complexity of the determinants of personality and its attributes (e.g. authoritarianism, risk-taking, locus of control, achievement orientation and dogmatism) in a fashion that leads to agreement.

The concepts described represent progressive levels of abstraction – that is, the degree to which the concept does or does not have objective referents. 'Table' is an objective concept in that we can point to a table and we can conjure up in our minds an image of a table. An abstraction like personality is much more difficult to visualize. Such abstract concepts are often called constructs.

Constructs

As used in research in the social sciences, the term ‘construct’ refers to an image or idea specifically invented for a given research and/or theory-building purpose. We build constructs by combining the simpler concepts, especially when the idea or image we intend to convey is not directly subject to observation.

Concepts and constructs are easily confused. Here’s an example to clarify the differences involved. A human resource analyst at CadSoft, an architectural software company that employs technical writers to work on its product manuals, is analysing the task attributes of a job that is in need of a redesign. She knows that the job description for a technical writer consists of three
components: presentation quality, language skill and job interest. Her job analysis reveals more specific characteristics.

Exhibit 1.6 illustrates some of the concepts and constructs she is dealing with. The concepts at the right of the exhibit (format accuracy, manuscript errors and keyboarding speed) are the most concrete and easily measured. We can observe keyboarding speed, for example, and even with crude measures agree on what constitutes slow and fast ‘keyboarders’. Keyboarding speed is one concept in the group that defines a construct that the human resource analyst calls ‘presentation quality’. Presentation quality is in itself, though, a non-existent entity, a ‘constructed type’. It is used to communicate the combination of meanings presented by the three concepts. The analyst uses it as a label for the concepts she has found empirically to be related.

Concepts in the the middle of Exhibit 1.6 are vocabulary, syntax and spelling. The analyst also finds them to be related. They form a construct that she calls ‘language skill’. She has chosen this term because these three concepts together define the language requirement in the job description. Language skill is placed at a higher level of abstraction in the exhibit because two of the concepts that comprise it – vocabulary and syntax – are difficult to observe and their measures more complex.

Looking at the left part of the exhibit, you will see that the analyst has not yet measured the last construct: ‘job interest’. This is the least observable and most difficult to measure. It is likely to be composed of numerous concepts – many of which will be quite abstract. Researchers sometimes refer to such entities as hypothetical constructs because they can be inferred only from data; thus, they are presumed to exist but must await confirmation from further testing. If research ultimately shows the concepts and constructs in this example to be interrelated, and if the propositions that specify the connections can be supported, the researcher will have the beginnings of a conceptual scheme. In graphic form it would depict the relationships among the knowledge and skill requirements necessary to clarify the job redesign effort.

EXHIBIT 1.6 CONSTRUCTS COMPOSED OF CONCEPTS IN A JOB REDESIGN EXAMPLE
Definitions
Confusion about the meaning of concepts can destroy a research study’s value without the researcher or client realizing it. If words have different meanings for the different parties involved, then they will not be communicating on the same wavelength. Having a mutually acceptable set of definitions is one way to reduce this danger.

Researchers must struggle with two types of definition: dictionary definitions and operational definitions. In the more familiar dictionary definition, a concept is defined with a synonym. For example, a customer is defined as a patron; a patron, in turn, is defined as a customer or client of an establishment; a client is defined as one who employs the services of any professional and also, loosely, as patron of any shop.17 These ‘circular’ definitions may be adequate for general communication but not for research. In research, we must measure concepts and constructs, and this requires more rigorous definitions.

OPERATIONAL DEFINITIONS An operational definition is one stated in terms of specific testing or measurement criteria. These terms must have empirical referents (that is, we must be able to count, measure or in some other way gather the information via our senses). Whether the object to be defined is physical [e.g. a machine tool] or highly abstract [e.g. achievement motivation], the definition must specify characteristics and how they are to be observed.

Marriott: what is concierge service?
Marriott International, Inc. is a leading hotel chain with more than 1800 properties in 53 countries and territories under various brand names (Marriott, Fairfield Inn, Residence Inn, Courtyard, TownePlace Suites, Fairfield Suites, Renaissance and ExecuStay). Due to the diversity of its operations, when managers in this company want to deliver global consistency, they turn to its sophisticated internal research division.

“We wanted to know what level of service the terms concierge, club or executive level implied. We also needed to know which term generated feelings of belonging and appreciation. We need a term that promises a level of superior service that we can deliver consistently in every property throughout the world,” says manager of marketing research Brenda Roth.

The task, then, was to find a global term for the special services floor found in Marriott and Renaissance properties. First, ‘pulse groups’ were conducted in the United States. Then a study was conducted that involved 60 hotel intercept interviews in Hong Kong, London and Frankfurt. Interviewers were bilingual, carrying out their interviews in the domestic language, while recording responses in English to allow for speedy data processing and analysis.

While most guests shared some common interpretations of the terms, ‘one possible German connotation of concierge was as a building superintendent similar to a custodian – certainly not a desired interpretation’.

What operational definition would you develop for concierge service?

References and further reading
- www.marriott.com
specifications and procedures must be so clear that any competent person using them would be able to classify the objects in the same way.

For example, suppose college undergraduates are to be classified by class. No one has much trouble understanding terms such as fresher (first-year student), sophomore (second-year student), and so on; but the task may not be that simple if you must determine which students fall into which class. To do this, you need operational definitions.

Operational definitions may vary, depending on your purpose and the way you choose to measure them. Here are two different situations that require different definitions of the same concepts.

1 You conduct a survey among students and wish to classify their answers by their class status. You merely ask them to report their class status and you record it. In this case, class is divided into fresher, second-year student, junior (third-year student) or senior (fourth- or final-year student), and you accept the answer each respondent gives as correct. This is a rather casual definition process but none the less an operational definition. It is probably adequate in this case even though some of the respondents may report inaccurately.

2 You wish to make a tabulation of the class status of students for the university registrar’s annual report. The measurement task here is more critical, so your operational definition needs to be more precise. You decide to define class status in terms of ‘hours of credit’ (i.e. the number of hours of attendance completed by the end of the spring term and recorded in each student’s record in the registrar’s office), as indicated below.

- Fresher: fewer than 30 hours’ credit
- Second-year student: 30–59 hours’ credit
- Junior: 60–89 hours’ credit
- Senior: more than 90 hours’ credit

The two examples given above deal with relatively concrete concepts, but operational definitions are even more critical in treating abstract ideas. Suppose you want to measure a construct called ‘organizational commitment’. You may intuitively understand what this means, but it is difficult to attempt to measure it among workers. You would probably need to develop a commitment scale of your own, or you may be able to use a scale that has already been developed and validated by someone else. This scale then operationally defines the construct.

While operational definitions are needed in research, they also present some problems. One ever-present danger is thinking that a concept and its operational definition are the same thing. We forget that our definitions provide only a limited insight into what a concept or construct really is. In fact, the operational definition may be quite narrow and quite dissimilar to that someone else might use when researching the same topic. When measurements by two different definitions correlate well, this correlation supports the view that each definition measures the same concept adequately.

The problem of operational definitions is particularly difficult when dealing with constructs. Constructs have few empirical referents by which to confirm that an operational definition really measures what we hope it does. The correlation between two different definition formulations strengthens the belief that we are measuring the same thing. On the other hand, if there is little or no correlation, this may mean that we are tapping several different partial meanings of a construct. It may also mean that one or both of the operational definitions are not true labels.

Whether you use a definitional or operational definition, its purpose in research is basically the same: to provide a way of understanding and measuring concepts. You may need to provide operational definitions for only a few critical concepts, but these will almost always be the definitions used to develop the relationships found in hypotheses and theories.
Variables
Scientists operate at both theoretical and empirical levels. At the theoretical level, there is a preoccupation with identifying constructs and their relationship to propositions and theory. At this level, constructs cannot, as we have already said, be observed. At the empirical level, where the propositions are converted to hypotheses and testing occurs, the scientist is likely to be dealing with variables. In practice, the term variable is used as a synonym for construct, or the property being studied. In this context, a variable is a symbol to which we assign a numeral, or value.18

The numerical value assigned to a variable is based on that variable’s properties. For example, some variables, said to be dichotomous variables, have only two values, reflecting the presence or absence of a property. For example, employed/unemployed and male/female have two values, generally 0 and 1. Gender is a typical example for such a dichotomous variable. You can either be female (the value of the variable is 1) or not female, i.e. male (the value of the variable is 0).

Variables also take on values that represent the addition of further categories, such as the demographic variables of race or religion. All variables that produce data that fit into categories are said to be discrete, since only certain set values are possible. An automotive variable, for example, where Renault is assigned a 5 and Volkswagen a 6, provides no option for 5.5.

Income, temperature, age or a test score are examples of continuous variables. These variables may take on values within a given range or, in some cases, an infinite set. Your test score may range from 0 to 100, your age may be 23.5 and your present income could be €24,583.

INDEPENDENT AND DEPENDENT VARIABLES Researchers are most interested in relationships among variables. For example, does a participative leadership style (independent variable) influence job satisfaction or performance (dependent variables) or can a superior staff member’s modelling of ethical behaviour influence the behaviour of her subordinates?

Exhibit 1.7 lists some terms that have become synonyms for independent variable and dependent variable. It is important to remember that there are no preordained variables waiting to be discovered ‘out there’ that are automatically assigned to one category or the other. As one writer notes.

There’s nothing very tricky about the notion of independence and dependence. But there is something tricky about the fact that the relationship of independence and dependence is a figment of the researcher’s imagination until demonstrated convincingly. Researchers hypothesize relationships of independence and dependence: They invent them, and then they try by reality testing to see if the relationships actually work out that way.19

EXHIBIT 1.7 DEFINING INDEPENDENT AND DEPENDENT VARIABLES

<table>
<thead>
<tr>
<th>Independent variable</th>
<th>Dependant variable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Presumed reason</td>
<td>Presumed effect</td>
</tr>
<tr>
<td>Stimulus</td>
<td>Response</td>
</tr>
<tr>
<td>Predicted from …</td>
<td>Predicted to …</td>
</tr>
<tr>
<td>Antecedent</td>
<td>Consequence</td>
</tr>
<tr>
<td>Manipulated</td>
<td>Measured outcome</td>
</tr>
<tr>
<td>Predictor</td>
<td>Criterion</td>
</tr>
</tbody>
</table>
In each relationship, there is at least one independent variable (IV) and one dependent variable (DV). It is normally hypothesized that, in some way, the IV ‘causes’ the DV to occur. It should be noted, however, that while it is easy to establish whether an IV influences a DV, it is much harder to show that the relationship between an IV and DV is a causal relationship [see also Chapter 4]. In Exhibit 1.8a, this relationship is illustrated by an arrow pointing from the independent variable to the dependent variable. For simple relationships, all other variables are considered extraneous and are ignored.

**MODERATING OR INTERACTION VARIABLES** In actual study situations, however, such a simple one-to-one relationship needs to be conditioned or revised to take other variables into account. Often, we can use another type of explanatory variable that is of value here: the moderating variable (MV). A moderating or interaction variable is a second independent variable that is included because it is believed to have a significant contributory or contingent effect on the original IV–DV relationship. The arrow pointing from the moderating variable to the arrow between the IV and DV in Exhibit 1.8a exemplifies the difference between an IV directly affecting the DV and an MV affecting the relationship between an IV and the DV. For example, one might hypothesize that, in an office situation:

> The introduction of a four-day working week (IV) will lead to higher productivity (DV), especially among younger workers (MV).

In this case, there is a differential pattern of relationship between the four-day week and productivity that is the result of age differences among the workers. Hence, after introducing a four-day working week the productivity gain for younger workers is higher than that for older workers. It should be noted that the effect of the moderating or interaction variable is the ‘surplus’ of the combined occurrence of introducing a four-day working week and being a younger worker.

To illustrate this point, assume that the productivity of younger workers is 12 percentage points higher than that for older workers, and that the productivity of workers having a four-day working week is 6 percentage points higher than those of workers having a five-day working week. If the productivity of a younger worker having a four-day working week is only 18 percentage points higher than the productivity of a older worker with a five-day working week, there is no interaction effect, because the 18 percentage points are the sum of the main effects. There would be an interaction effect if the productivity of the younger worker on a four-day week was, for example, 25 percentage points higher than the productivity of the older worker on a five-day week.

Whether a given variable is treated as an independent or moderating variable depends on the hypothesis under investigation. If you were interested in studying the impact of the length of the working week, you would make the length of week the IV. If you were focusing on the relationship between age of worker and productivity, you might use working week length as an MV.

**EXTRANEOUS VARIABLES** An almost infinite number of extraneous variables (EVs) exists that might conceivably affect a given relationship. Some can be treated as IVs or MVs, but most must either be assumed or excluded from the study. Fortunately, an infinite number of variables has little or no effect on a given situation. Most can safely be ignored, as their impact occurs in such a random fashion as to have little effect. Others might influence the DV, but their effect is not at the core of the problem we investigate. Still, we want to check whether our results are influenced by them. Therefore, we include them as control variables (CVs) in our investigation to ensure that our results are not biased by not including them. Taking the example of the effect of the four-day working week again, one would normally think that weather conditions, the imposition of a local sales tax, the election of a new mayor, and thousands of similar events and conditions would have little effect on working week and office productivity. You should note that inclusion of control variables is especially important for research conducted in the positivistic approach, as it allows you to reduce the problem investigated and nevertheless account for additional factors. Extraneous variables can also be confounding variables (CFVs) to our hypothesized IV–DV relationship, similar to moderating variables. You may consider that the kind
of work being done might have an effect on the impact of working week length on office productivity. This might lead you to introducing time spent in a meeting to coordinate the work as a confounding variable (CFV). In our office example, we would attempt to control for type of work by studying the effect of the four-day working week within groups attending meetings with different intensity.

For workers less frequently asked to attend internal meetings (CFV), the introduction of a four-day working week (IV) will lead to higher productivity (DV), especially among younger workers (MV).

In Exhibit 1.8b, sunshine is shown as an extraneous variable, the broken line indicates that we included it in our research because it might influence the DV, but we consider the CV as irrelevant for the investigation of our research problem. Similarly we included the type of work as a CFV.

INTERVENING VARIABLES The variables mentioned with regard to causal relationships are concrete and clearly measurable – that is, they can be seen, counted or observed in some way. Sometimes, however, one may not be completely satisfied by the explanations they give. Thus, while we may recognize that a four-day working week results in higher productivity, we might think that this is not the whole story – that working week length affects some intervening variable (IVV) that, in turn, results in higher productivity.

An IVV is a conceptual mechanism through which the IV and MV might affect the DV. The IVV can be defined as a factor which theoretically affects the DV but cannot be observed or has not been measured; its effect must be inferred from the effects of the independent and moderator variables on the observed phenomenon.20

In the case of the working week hypothesis, one might view the intervening variable (IVV) to be job satisfaction, giving a hypothesis such as:

The introduction of a four-day working week (IV) will lead to higher productivity (DV) by increasing job satisfaction (IVV).

Here we assume that a four-day working week increases job satisfaction; similarly, we can assume that attending internal meetings is an indicator negatively related to the routine character of work. Exhibit 1.8c illustrates how `theoretical’ constructs, which are not directly observed, fit into our model.

Let’s look at some additional examples to illustrate the relationships between independent, moderating, control, extraneous and dependent variables.

The management of a bank wishes to study the effect of promotion on savings. It might advance the following hypothesis:

A promotion campaign (IV) will increase savings activity (DV), especially when prizes are offered (MV), but chiefly among smaller savers (EV/control). The results come from enhancing the motivation to save (IVV).

Or suppose you are studying a situation that involves the causes of defective parts production. You might hypothesize as follows:

Changing to worker self-inspection (IV) will reduce the number of defective parts (DV) when a part can be identified with its producer (MV) in electronic assembly work (EV/control), by stimulating the worker’s sense of responsibility (IVV).
EXHIBIT 1.8 RELATIONSHIP BETWEEN DIFFERENT TYPES OF VARIABLES

(a)
- IV: four-day working week
- MV: workers' age
- DV: productivity

(b)
- CV: sunshine
- IV: four-day working week
- CFV: meeting attendance
- MV: workers' age

(c)
- CV: sunshine
- IV: four-day working week
- IVV: job satisfaction
- IVV: routine work
- CFV: meeting attendance
- MV: workers' age
- DV: productivity
Propositions and hypotheses
We define a proposition as a statement about concepts that may be judged as true or false if it refers to observable phenomena. When a proposition is formulated for empirical testing, we call it a hypothesis. As a declarative statement, a hypothesis is of a tentative and conjectural nature.

Hypotheses have also been described as statements in which we assign variables to cases. A case is defined in this sense as the entity, or thing, the hypothesis talks about. The variable is the characteristic, trait or attribute that, in the hypothesis, is ascribed to the case.21

For example, we might form the following hypothesis:

- Executive Jones (case) has a higher than average achievement motivation (variable).

If our hypothesis were based on more than one case, it would be a generalization. For example:

- Executives in Company Z (cases) have a higher than average achievement motivation (variable).

Descriptive hypotheses
Both of the above hypotheses are examples of descriptive hypotheses. These are propositions that typically state the existence, size, form or distribution of some variable. For example:

- In Denmark (case), the October seasonally adjusted unemployment rate (variable) stands at 5.8 per cent of the labour force.
  - The member states of the European Union (case) are experiencing budget difficulties (variable).
  - Eighty per cent of Company Z stockholders (case) favour increasing the company’s cash dividend (variable).

Researchers often use a research question rather than a descriptive hypothesis. Thus, in place of the above hypotheses, we might use the following questions.

- What is the unemployment rate in Denmark?
- Are European states experiencing budget difficulties?
- Do stockholders of Company Z favour an increased cash dividend?

Either format is acceptable, but the descriptive hypothesis format has several advantages, as follows.

- It encourages researchers to crystallize their thinking about the likely relationships to be found.
- It further encourages them to think about the implications of a supported or rejected finding.
- It is useful for testing statistical significance.

Relational hypotheses
The research question format is less frequently used with a situation calling for relational hypotheses. These are statements that describe a relationship between two variables with respect to a particular case. For example:

- Foreign (variable) cars are perceived by Italian consumers (case) to be of better quality (variable) than domestic cars.
In this instance, the nature of the relationship between the two variables ('country of origin' and 'perceived quality') is not specified. Is there only an implication that the variables occur in some predictable relationship, or is one variable somehow responsible for the other? The first interpretation (unspecified relationship) indicates a correlational relationship; the second (predictable relationship) indicates an explanatory, or causal, relationship.

**Correlational hypotheses** state merely that the variables occur together in some specified manner without implying that one causes the other. Such weak claims are often made when we believe there are more basic causal forces that affect both variables or when we have not developed enough evidence to claim a stronger linkage. Here are three sample correlational hypotheses:

- Young machinists (under 35 years of age) are less productive than those who are 35 years of age or older.
- The height of women’s hemlines varies directly with the level of the business cycle.
- People in the UK give the European Commission a less favourable rating than do people in France.

By labelling these as correlational hypotheses, we make no claim that one variable causes the other to change or take on different values. Other researchers, however, may view one or more of these hypotheses as reflecting cause-and-effect relationships.

With **explanatory (causal) hypotheses**, there is an implication that the existence of, or a change in, one variable causes or leads to a change in the other. As noted earlier, the causal variable is typically called the independent variable (IV) and the other the dependent variable (DV). ‘Cause’ means roughly to ‘help make happen’; so the IV need not be the sole reason for the existence of, or change in, the DV.

Here are three examples of explanatory hypotheses:

- An increase in family income (IV) leads to an increase in the percentage of income saved (DV).
- Exposure to the company’s messages concerning industry problems (IV) leads to more favourable attitudes (DV) from production workers towards the company.
- Loyalty to a particular grocery store (IV) increases the probability of purchasing the own-label goods (DV) sponsored by that store.

In proposing or interpreting causal hypotheses, the researcher must consider the direction of influence. In many cases, this is obvious from the nature of the variables. Thus, one would assume that family income influences savings rate rather than vice versa.

Sometimes our ability to identify the direction of influence depends on the research design. In the worker attitude hypothesis, if exposure to the message clearly precedes attitude measurement, then the direction of exposure to attitude seems clear. If sets of information about both exposure and attitude were collected at the same time, the researcher might be justified in saying that different attitudes led to selective message perception or non-perception. Store loyalty and the purchasing of store brands, for example, appear to be interdependent. Loyalty to a store may increase the probability of buying the store’s own-label goods, but satisfaction with the store’s own-label goods may also lead to greater store loyalty.
The role of the hypothesis
In research, a hypothesis serves several important functions:

- it guides the direction of the study
- it identifies those facts that are relevant and those that are not
- it suggests which form of research design is likely to be most appropriate
- it provides a framework for organizing the conclusions.

A frequent problem in research is a proliferation of interesting information. Unless the researcher curbs their urge to include additional elements, a study can be diluted by trivial concerns that do not answer the basic questions posed by the management dilemma (i.e. the focus of the research). The virtue of a hypothesis is that, if taken seriously and adhered to, it limits what will be studied.

To consider the role of the hypothesis in determining the direction of a piece of research, suppose we take this example:

Husbands and wives agree in their perceptions of their respective roles in purchase decisions.

The hypothesis specifies who will be studied (married couples), in what context they will be studied (their consumer decision-making), and what in particular will be studied (their individual perceptions of their roles).

The nature of this hypothesis and the implications of the statement suggest that the best research design would be a communication-based study, probably a survey or interview. We have at this time no other practical means to ascertain perceptions of people except to ask about them in one way or another. In addition, we are interested only in the roles that are assumed in the purchase or consumer decision-making situation. The study should not, therefore, involve itself in seeking information about other types of roles husbands and wives might fulfil.

Reflection on this hypothesis might also reveal that husbands and wives disagree on their perceptions of their roles, but these differences may be explained in terms of additional variables, such as age, social class, background, personality differences and other factors not associated with their difference in gender.

What makes a good hypothesis?
A good hypothesis should fulfil three conditions. It should be:

- adequate for its purpose
- testable
- better than its rivals.

For a descriptive hypothesis, adequacy for its purpose means that it clearly states the condition, size or distribution of some variable in terms of values that are meaningful to the research task. If it is an explanatory hypothesis, it must explain the facts that gave rise to the need for explanation. Using the hypothesis, plus other known and accepted generalizations, one should be able to deduce the original problem condition.

A hypothesis is testable if it meets the following conditions:

- It does not require techniques that are currently unavailable.
- It does not require an explanation that defies known physical or psychological laws.
- There are consequences or derivatives that can be deduced for testing purposes.
Generally, a hypothesis is better than its rivals if it:

- has a greater range than its rivals
- explains more facts than its rivals
- explains a greater variety of facts than its rivals
- is simple, requiring few conditions or assumptions.

**Theory**

Hypotheses play an important role in the development of theory. While theory development has not, historically, been an important aspect of business research, it is gradually becoming more influential.

Someone who is unfamiliar with research might use the term theory to mean the opposite of fact. In this sense, theory is viewed as being speculative. You might hear, say, that Professor X is too theoretical, that managers need to be less theoretical, or that some idea will not work because it is too theoretical. For the researcher, this gives a distorted picture of the relationship between fact and theory.

When you are too theoretical, this is likely to mean that the basis of your explanation or decision is not sufficiently attuned to specific empirical conditions. Although this may be so, it does not prove that theory and fact are opposites. The truth is that fact and theory are each necessary for the other to be of value. Our ability to make rational decisions, as well as to develop scientific knowledge, is measured by the degree to which we combine fact and theory.

We all operate on the basis of the theories we hold. In one sense, theories are the generalizations we make about variables and the relationships among them. We use these generalizations to make decisions and predict outcomes. For example, it is midday and you note that, outside, the natural light is dimming, dark clouds are moving rapidly in from the west, the breeze is freshening and the air temperature is getting cooler. Would your understanding of the relationship between these variables (your weather theory) lead you to predict that something decidedly wet is likely to occur at any minute?

Consider a situation where you are called upon to interview two people for possible promotion to the position of department manager. Do you have a theory about the characteristics such a person should have?

Suppose you interview Ms A and observe that she answers your questions well, openly and apparently sincerely. She also expresses thoughtful ideas about how to improve departmental functioning and is articulate in stating her views. Ms B, on the other hand, is guarded in her comments and reluctant to advance ideas for improvement. She answers questions by saying what 'Mr General Manager wants'. She is also less articulate and seems less sincere than Ms A. You would probably choose Ms A, based on the way you combine the concepts, definitions and propositions mentioned into a theory of managerial effectiveness. Your theory of managerial effectiveness, while workable, may not necessarily be a good theory because of the variables it has ignored, but it illustrates that we all use theory to guide our decisions, predictions and explanations.

A theory is a set of systematically interrelated concepts, definitions and propositions that are advanced to explain and predict phenomena (facts). In this sense, we have many theories and use them continually to explain or predict what goes on around us. To the degree that our theories are sound and fit the situation at hand, we are successful in forming explanations and predictions. Thus, while a given theory and a set of facts may not 'fit', they are not opposites. Our challenge is to build a better theory and to be more skilful in fitting together theory and fact.

The ways in which theory differs from hypothesis may also be a source of confusion. This book makes the general distinction that the difference between theory and hypothesis is one of degree of complexity and abstraction. In general, theories tend to be complex, abstract and
involve multiple variables. Hypotheses, on the other hand, tend to be simple, limited-variable propositions involving concrete instances.

While researchers note a difference, at times the terms theory and hypothesis are used interchangeably. Doing this should not make much practical difference to your applied research.

Theory and research
It is important for researchers to recognize the pervasiveness and value of theory. Theory serves us in many useful ways. It:

- narrows the range of facts we need to study
- suggests which research approaches are likely to yield the greatest meaning
- suggests a system for the researcher to impose on data in order to classify them in the most meaningful way
- summarizes what is known about an object of study, and states the uniformities that lie beyond immediate observation
- can be used to predict any further facts that may be found.

Models
The term model is used in various fields of business and allied disciplines with little agreement as to its definition. This may be because of the numerous functions, structures and types of model that exist. Most definitions agree, however, that models represent phenomena through the use of analogy. A model may be defined for our purposes as the representation of a system that is constructed to study some aspect of that system or the system as a whole.

Models differ from theories in that a theory’s role is explanation, whereas a model’s role is representation:

A model is not an explanation; it is only the structure and/or function of a second object or process. A model is the result of taking the structure or function of one object or process and using that as a model for the second. When the substance, either physical or conceptual, of the second object or process has been projected onto the first, a model has been constructed.22

Many ideas about new product adoption, for example, can be traced to rural sociology models. These describe how information and innovations spread throughout communities or cultures, starting with opinion leaders. The behaviour of a respected leader is subsequently embraced by society as a whole to express homage to that leader and retain social acceptance.

Models may be used for applied or highly theoretical purposes. Almost everyone is familiar with queuing models of service: banks, post offices, telephone voice-response units and airport security units ‘feed’ patrons from a single queue to multiple service points. Other models, for assembly lines, transportation and inventory, also attempt to solve immediate practical needs. A model to advance a theory of quality of working life, for example, could target employee behaviour under conditions of flexitime, permanent part-time, job-sharing and compressed working week.

Description, explication and simulation are the three major functions of modelling. Each of these functions is appropriate to applied research or theory building.

- Descriptive models: describe the behaviour of elements in a system where theory is inadequate or non-existent.
- Explicative models: extend the application of well-developed theories or improve our understanding of their key concepts.
Simulation models: clarify the structural relationships of concepts and attempt to reveal the process relationships among them.\textsuperscript{23}

The latter can be:

- static (i.e. represent a system at one point in time)
- dynamic (i.e. represent the evolution of a system over time).

Monte Carlo simulation models are examples of static simulations. They simulate probabilistic processes using random numbers. Redistribution of market share, brand switching and prediction of future values are just some examples of areas that can benefit from dynamic modelling.

**SUMMARY**

1. Research is any organized inquiry that is carried out in order to provide information that can be used to solve problems. Business research is a systematic inquiry that provides information to guide business decisions. This includes reporting, descriptive, explanatory and predictive studies. This book emphasizes the last three.

2. What characterizes good research? Generally, we expect good research to be purposeful, with a clearly defined focus and plausible goals, with defensible, ethical and replicable procedures, and with evidence of objectivity. The reporting of procedures – their strengths and weaknesses – should be complete and honest. Appropriate analytical techniques should be used; conclusions drawn should be limited to those clearly justified by the findings; and reports of findings and conclusions should be presented clearly and be professional in tone, language and appearance. Managers should always choose a researcher who has an established reputation for good-quality work. The research objective and its benefits should be weighed against any potentially adverse effects.

3. Research in management and business is rooted in different research philosophies. The most prominent ones are positivism and interpretivism. Positivism is the research philosophy adopted from the natural sciences. Its proponents believe that the social world exists externally and can be viewed objectively. Hence a real truth exists and it can best be understood by reducing it to the simplest possible elements. Moreover, they claim that research is value-free and that researchers should take an independent role as objective analysts. Interpretivism supposes that the social world is constructed and people give subjective meaning to it. Hence, the social world is an individual construction and, to understand it, the researcher needs to look at a total picture. Unlike positivists, interpretivists believe that research is driven by interests and that the researcher is part of what is observed.

4. The demand for information tomorrow will be much greater than it is today. Research will make a major contribution to providing this knowledge. The knowledge of research methods will be of value in many situations for managers, public policy-makers and scientific researchers. They may need to conduct research either for themselves or for others. As users and readers of research results they will need to be able to judge research quality. Finally, they may become research specialists themselves.
Styles of thinking are perspectives, or filters, for determining how we view and understand reality. They affect what we accept as truth and govern how rigorously we test the information we receive before endorsing it. Although the scientific method is the preeminent means by which we secure empirical information, it is not the only source of truth. Other styles of thinking also have an apparent, and often useful, influence on business disciplines, and give their approval to the theory-building and problem-solving approaches of those fields.

Scientific inquiry is grounded in the inference process. This process is used for the development and testing of various propositions, largely through the so-called ‘double movement of reflective thinking’. Reflective thinking involves sequencing induction and deduction in order to explain inductively (by hypothesis) a puzzling condition/dilemma. In turn, the hypothesis is used in the deduction of further facts that can be sought to confirm or deny the truth of the hypothesis.

Researchers think of ‘doing science’ as an orderly process that combines induction, deduction, observation and hypothesis testing into a set of reflective thinking activities. Although the scientific method consists of neither sequential nor independent stages, the problem-solving process it reveals provides insight into the way research is conducted.

Scientific methods and scientific thinking are based on concepts – the symbols we attach to bundles of meaning that we hold and share with others. We invent concepts to help us to think about and communicate abstractions. We also use higher-level concepts – constructs – for specialized scientific explanatory purposes that are not directly observable. Concepts, constructs and variables may be defined descriptively or operationally. Operational definitions, which are essential in research, must specify adequately the empirical information needed and state how it will be collected. In addition, they must have the proper scope or ‘fit’ for the research problem at hand.

Concepts and constructs are used at the theoretical level; variables are used at the empirical level. Variables can be allocated numerals or values for the purpose of testing and measurement. They may be classified as explanatory (independent, dependent or moderating), extraneous or intervening.

Propositions are of great interest in research because they may be used to assess the truth or falsity of relationships among observable phenomena. When we advance a proposition for testing, we are hypothesizing. A hypothesis describes the relationships between or among variables. A good hypothesis is one that can explain what it claims to explain, is testable, and has greater range, probability and simplicity than its rivals.

Sets of interrelated concepts, definitions and propositions that are advanced to explain and predict phenomena are called theories. Models differ from theories in that models are analogies or representations of some aspect of a system or of the system as a whole. Models are used for description, explication and simulation.
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* Due to the confidential and proprietary nature of most research, the names of these companies have been changed.

Discussion questions

Terms in review

1. What is research? Why should there be any question about the definition of research?

2. What is the difference between applied and basic or pure research? Use a decision about how a salesperson is to be paid, by commission or salary, and describe the question that would guide applied research versus the question that would guide pure research.

3. Distinguish among the following sets of items, and suggest the significance of each in a research context.

   (a) concept and construct
   (b) deduction and induction
   (c) operational definition and dictionary definition
   (d) concept and variable
   (e) hypothesis and proposition
   (f) theory and model
   (g) scientific method and scientific attitude
4. Describe the basic principles and assumptions of positivism and interpretivism.

5. Describe the characteristics of the scientific method.

6. Listed below are some terms commonly found in a management setting. Are they concepts or constructs? Give two different operational definitions for each.
   
   (a) first-line supervisor  
   (b) employee morale  
   (c) assembly line  
   (d) overdue account  
   (e) line management  
   (f) leadership  
   (g) price–earnings ratio  
   (h) union democracy  
   (i) ethical standards

7. In your company’s management development programme there was a heated discussion between some people who claimed that ‘Theory is impractical and thus no good’ and others who claimed that ‘Good theory is the most practical approach to problems.’ What position would you take and why?

8. An automobile manufacturer observes demand for its brand increasing as per capita income increases. Sales increases also follow low interest rates, which ease credit conditions. Buyer purchase behaviour is seen to be dependent on age and gender. Other factors influencing sales appear to fluctuate almost randomly (e.g. competitor advertising, competitor dealer discounts, introductions of new competitive models).

   (a) If sales and per capita income are positively related, classify all variables as dependent, independent, moderating, extraneous or intervening.
   
   (b) Comment on the utility of a model based on the hypothesis.

Making research decisions

9. A human resources manager needs information in order to help him decide whether to create a ‘custom-built’ motivation programme or purchase one offered by a human resources consulting firm. What are the dilemmas the manager faces in selecting either alternative?

10. You are manager of the European division of a major corporation, supervising five animal feed plants scattered over four counties. Corporate headquarters asks you to conduct an investigation to determine whether any of these plants should be closed, expanded, moved or downsized. Is there a possible conflict between your roles as researcher and manager? Explain.

11. Advise each of the following people on a specific research study that he or she might find useful. Classify each proposed study as reporting, descriptive, explanatory or predictive.

   (a) When the management decision problem is known:
      
      (i) manager of a full-service restaurant with high employee turnover
(ii) head of an academic department committee charged with selecting a research methods textbook.

(b) When the management decision problem has not yet been specified:
   (i) manager of a restaurant
   (ii) plant manager at a shoe factory
   (iii) director of the TV programme *Who Wants To Be A Millionaire?* in charge of sponsor recruitment
   (iv) data analyst with ACNielsen (research specialist)
   (v) human resources manager at a university
   (vi) product manager for the Mercedes A Class
   (vii) family services officer for your county
   (viii) office manager for a paediatrician.

12 The new president of an old, established company is facing a problem. The company is currently unprofitable and is, in the president’s opinion, operating inefficiently. The company sells a wide range of equipment and supplies to the dairy industry. It manufactures some items and sells many wholesale to dairies, creameries and similar plants. Because the industry is changing in several ways, survival will become more difficult in the future. In particular, many equipment companies are bypassing wholesalers and selling direct to dairies. In addition, many independent dairies are being taken over by large food chains. How might research help the new president make the right decisions? In answering this question, consider the areas of marketing and finance as well as the company as a whole.

13 You have received the results of a research report carried out by a consultant on behalf of your firm, a life insurance company. The study is a survey of morale in the home office and covers the opinions of about 500 secretaries and clerks, as well as about 100 executives and actuaries. You are asked to comment on its quality. What will you look for?

14 As area sales manager for a company that manufactures and markets outboard engines, you have been assigned the responsibility of conducting a research study to estimate the sales potential of your products in the Scandinavian market. Discuss the key issues and concerns arising from the fact that you, the manager, are also the researcher.

15 You observe the following condition: ‘Our female sales representatives have lower customer defections than do our male sales representatives.’
   (a) Propose the concepts and constructs you might use to study this phenomenon.
   (b) How might any of these concepts and/or constructs be related to explanatory hypotheses?

16 You are the office manager of a large firm. Your company prides itself on its high-quality customer service. Lately, complaints have surfaced which reveal that an increasing number of incoming calls are being misrouted or dropped. Yesterday, when passing the main reception area, you noticed the receptionist fiddling with his hearing aid. In the
process, a call came in and would have gone unanswered if not for your intervention. This particular receptionist had earned an unsatisfactory review three months earlier, for tardiness. Your inclination is to urge this employee – who has been with the firm for 20 years – to retire, or to fire him if retirement is rejected. However, you know the individual is well liked and seen as a fixture in the company.

(a) Suggest several hypotheses that might account for dropped or misrouted incoming calls.

(b) Using the ‘double movement of reflective thought’, show how you would test these hypotheses.

From concept to practice

17 Apply the principles in Exhibit 1.1 to the research scenario in question 8.

18 Using Exhibits 1.4 and 1.5 as a guide, draw up graphs to illustrate the inductions and deductions in the following statements. (If there are gaps, supply what is needed to make them complete arguments.)

(a) Repeated studies indicate that economic conditions vary with – and lag 6 to 12 months behind – the changes in the national money supply; therefore, we may conclude that money supply is the basic economic variable.

(b) Research studies show that heavy smokers have a higher rate of lung cancer than do non-smokers; therefore, heavy smoking causes lung cancer.

(c) Show me a person who goes to church regularly, and I will show you a reliable worker.

Class discussion

19 Suppose you are part of an international team of social experts asked to assess the organizational culture within a large life insurance company. All class members born in the months January to June should follow the positivistic research philosophy, while those class members born in the months July to December take the interpretivism route. Discuss how the organizational culture of the company could be assessed.

20 Business decisions are often taken under immense time pressure. Often, there is just not enough time to collect information based on good research. Discuss on which criteria of good research you would compromise if you just did enough not have enough time; or would it be better to abandon the research altogether, if it cannot be conducted well, as the obtained information is likely to be invalid and unreliable?
section 1 essentials of research

Internet exercises
Visit our website (www.mcgraw-hill.co.uk/textbooks/blumberg) for Internet exercises related to this chapter.

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A glossary of key terms can be found on the Online Learning Centre for this book.

NOTES
1 See, for example, Murray Levine, ‘Investigative reporting as a research method: analysis of Bernstein and Woodward’s All the President’s Men’, American Psychologist 35 (1980), pp. 626–38.
4 A hypothesis is a statement that is advanced for the purpose of testing its truth or falsity.
5 An exploratory study describes an investigation when the final research problem has not yet been clearly fixed. Its aim is to provide the insights needed by the researcher to develop a more formal research design.
chapter 1 the nature of business and management research

12 This section is based on Dewey, How We Think, and John R. Platt, ‘Strong inference’, Science, 16 October 1964, pp. 347–53.
19 Hoover, Elements of Social Scientific Thinking, p. 71.

RECOMMENDED FURTHER READING
  ■ Medema, Steven G. and Warren J. Samuels [eds], Foundations of Research in Economics. How do Economists do Economics? Cheltenham: Edward Elgar, 1997. This edited volume offers insights from outstanding economists on how to conduct economic research. Although it focuses on economics, the insights provided are also useful for other social sciences.

