rama. For example, Arthur Miller vividly portrays alienation in the character of Willie Loman in *Death of a Salesman*. The fabric of this a theoretical statement as Bagozzi's structural equation model or mous sociological theory of egoistic suicide. Miller depicts the use of alienation in an individualistic, competitive world; Bagozzi's research on job performance; Durkheim relates individualism and employment to higher rates of egoistic suicide.

Involves, the expression becomes clearer and more complete. One the evolution is as an upward spiral, with each movement upward motion of consciousness or increased awareness of the total set of 1 in explaining a particular phenomenon. The laws, or general- result from this process can be viewed symbolically. The apparently of marketing (or physics, engineering, philosophy) can be understood or viewed geometrically, as, for example, a triangle: with only for conditions, the problem is incomplete; the third point complements. For example, in reproduction, the male and female unite to form electricity, the positive and negative poles of the battery unite to mark. In marketing, the buyer and seller unite to form the exchange sale. Proposition formation serves as a completion of the triangle concepts are related to form the third point; alone, they would have not. We recognize the universal nature of things and realize what we then we can speak in terms of laws. By thinking symbolically at the level, we are more likely to evolve laws or generalizations.

FIVE

DEDUCTIVE AND INDUCTIVE THINKING

In this chapter we suggest that much creative thinking is the result of the nearly simultaneous use of both deductive and inductive thinking, although the deductive approach is often used to present the results of our thinking to others. By deemphasizing the role of inductive thinking, there is a substantial risk of losing creativity. This is especially true with respect to creative insights which may be derived from practical experience.

The chapter has been devoted to the topic of concepts, which are the building blocks of theories. These blocks are united to form propositions, which are connected to form theories or explanations. Concepts, and subsequently done with them, are, in Albert Einstein's words, "free to be human mind." This is perhaps the single most important thing to keep in mind while reading subsequent chapters. A wide variety of social or scientific conventions exist for the development, testing, and use of concepts. These conventions are guidelines for tinkering.

CHAPTER FIVE: DEDUCTIVE AND INDUCTIVE THINKING

People do not get married or divorced, commit murder or suicide, or lay down their lives for freedom upon detailed cognitive analysis of the pros and cons of their actions.

R. B. Zajone

He who hesitates is lost.

Old proverb

Look before you leap.

Old proverb

Before exploring the notion of theory-in-use, a central theme in this book, it is necessary to understand the predominant espoused approach used in theory construction—the logical or hypothetical deductive method.

The theory-in-use approach focuses on generating concepts, propositions, and theories by observing multiple subjects or cases where theories are in apparent use. It involves both inductive and deductive logic. Often, however, we find one or the other mode of logic being advocated. The logical deductive approach starts with a set of concepts and propositions and then deduces that, if these propositions are true, and if certain other conditions are met, certain specific and observable events will occur. The goal of this method of theory construction is to “gradually eliminate invalid propositions and increase the number of useful valid ones.” The inductive mode stresses the formal or informal accumulation of data, which may lead to a tentative theory.

The benefits of each approach have been argued for decades, as indicated by this early statement by Francis Bacon:

There are and can only be two ways of searching into and discovering truth. The one flies from the senses and particulars to the most general axioms, and from these principles, the truth of which it takes for settled and immovable, proceeds to judgement and to discovery of middle axioms. And this way is now in fashion (deduction). The other derives from the senses and particulars, rising by gradual and unbroken ascent, so that it arrives at the most general axioms last of all (induction). This is the true way, but as yet untired.


Francis Bacon, Aphorism XIX, Novum Organum, 1620.

Reynolds takes the argument further and identifies the steps in each strategy and their underlying assumptions:

INDUCTIVE APPROACH
(research then Theory)

Step 1: Select a phenomenon and list all the characteristics of the phenomenon.

Step 2: Measure all the characteristics of the phenomenon in a variety of situations (as many as possible).

Step 3: Analyze the resulting data carefully to determine if there are any systematic patterns among the data “worthy” of further attention.

Step 4: Once significant patterns have been found in the data, formalization of these patterns as theoretical statements constitutes the “laws” of nature.

LOGICAL DEDUCTIVE APPROACH
(theory then Research)

Step 1: Develop an explicit theory in either axiomatic or process description form.

Step 2: Select a statement generated by the theory for comparison with the results of empirical research.

Step 3: Design a research project to “test” the chosen statement’s correspondence with empirical research.

Step 4: If the statement derived from the theory does not correspond with the research results, make appropriate changes in the theory or research design and continue.

Step 5: If the statement from the theory does correspond with the results of the research, select further statements for testing or attempt to determine the limitations of the theory (situations where the theory does not apply).

It should be emphasized that although the extremes are presented here as ideal

types, these approaches are not mutually exclusive. In fact, it is essential to realize that they are often used simultaneously. We shall rely on two different representations to convey this important idea.

George E. P. Box, an eminent statistician, remarks that "science is a means whereby learning is achieved, not by mere theoretical speculations on the one hand, nor by the undirected accumulation of practical facts on the other, but rather by a motivated iteration between theory and practice." He continues to observe, with reference to Figure 5.1, that "Matters of fact can lead to a tentative theory. Deductions from this tentative theory may be found to be discrepant with certain known or specially acquired facts. These discrepancies can then induce a modified, or in some cases a different theory. Deductions made from the modified theory may or may not be in conflict with fact, and so on. In reality this main iteration is accompanied by many simultaneous subiterations." Box's thinking is displayed in Figure 5.1 and in somewhat more detail in Figure 5.2.

Seymour Fine presents a very interesting perspective on the same process. Drawing on John Dewey's classic book *How We Think*, Fine describes the reasoning process as "a two-way movement from partial, fragmentary, and often confused facts to an idea, and then back again to facts (not merely the original facts but new particulars). The first leg of the trip is heuristic, intuitive, inductive. The second leg reinforces, orders, and synthesizes the original data by connecting them with one another and with additional facts to which the data have brought attention. The trip is never back and forth just once, but continuous. With each

A (1) An iteration between theory and practice

Hypotheses
Model
Conjecture
Theory idea

Practice
Data
Facts

Deduction
Induction

Hj + 1 replaces Hj

A (2) A feedback loop

Hypothesis Hj

Modified
hypothesis
Hj + 1

Induction
Error signal

Consequences of Hj

Deduction

Figure 5.1. The advancement of learning.

Figure 5.2. Data analysis and data getting in the process of scientific investigation. The experimental design is here shown as a movable window looking onto the true state of nature. Its positioning at each stage is motivated by current beliefs, hopes, and ideas.

circuit, the original facts and the inferred ideas are strengthened into premises and in turn, into final beliefs or conclusions." Figure 5.3 summarizes these ideas.

When fact and idea or intellect and intuition are not allowed to interact, at least one usually suffers and it is generally the realm of fact or intellect which does. We think Exhibit 5.1 expresses this as well as any long narrative might.

Inductive (Research then Theory) Approach

Despite the iterative and perhaps even simultaneous nature of inductive-deductive reasoning, it will be useful at this point to stop and examine further the

PROBLEM
confused facts
observations
occurrences
coherent experiences

REASONING
Inductive discovery
Deductive testing
Inductive discovery
Deductive testing

IDEA
conjecture hypothesis
suggestion
premise
judgment
belief

GUIDING PRINCIPLES

Figure 5.3. The idea within the context of the problem-solving process.


would be monitored by the leading trade publications. Primary marketing research, in the form of a survey, would be necessary to ascertain changes in the customer mix. Demographics and lifestyle dimensions could be researched through mail questionnaires or personal interviews. The manager would seek data for as many different situations as possible. For example, data could be broken down by specific product lines and time periods, as well as certain geographical areas and target groups. Data on other stores in the same line of business would also be useful but much more difficult to obtain.

Step 3 would entail analyzing the data to determine if any systematic patterns can be identified. This might involve generating frequencies and cross-tabulation. If sample sizes are small, nonparametric statistics could be used. With larger samples, a host of multivariate methods are available. Any statistical analysis used must go hand in hand with the manager's intuitive judgment as to the validity of the findings.

The manager and research department systematically ruled out a number of explanations, but one pattern consistently came out: sales had been decreasing proportionally to the number of regular "big buy" customers who had not been coming in since the advertising campaign had started. He looked closely at the advertising campaign and how it might have affected his regular customers. Although he had always had a "high-value" image (good price, good quality) the recent campaign had attempted to add a little more prestige to the store, since he was hoping to broaden his market a little. He reasoned that the higher-prestige advertising had resulted in a lower acceptance of his store by regular customers (it didn't fit their image anymore).

Step 4 would focus on generalizing this pattern and presenting it as a theoretical statement. In this case the manager concluded that a store patronage problem was present. People who are regular shoppers may develop an attachment to a store that matches their self-image. The greater the compatibility of shopper and store "personalities," the greater the store patronage. Conversely, a lower compatibility leads to lower store patronage.

The general theoretical statement derived above has implications for the manager in future advertising and promotion efforts. However, one must estimate how "good" the explanation is that he came up with and how much confidence one would place in making a decision based upon it.

Deductive (Theory then Research) Approach

A manager faced with the same problem could have approached it in a more deductive manner. After discussing the problem with a consultant, a general approach was developed to explain the problem, which could be represented by the diagram in Figure 5.4. We'll assume the consultant had encountered this representation in a professional journal and had found it to be a useful framework.
implication for the manager? If the test "disproved" the statement, then that aspect of the theory might be reformulated or a different type of research design or measurement procedure might be adopted.8

Induction and Deduction:
Parts of the Same Wheel

Both approaches represent a different process of developing and testing theories. Also, both can result in different theories being developed for what appears to be the "same" problem. There have been great arguments concerning which approach is "best" and which approach is actually practiced by researchers and scientists.9 But are the two approaches completely incompatible?

Wallace10 would suggest that although they reflect different assumptions about theorizing, they do in fact represent different stages of the overall process of developing and testing theories. Rather than choosing between theories or theory strategies, why not combine them into an ongoing process? The "Wallace Wheel," shown in Figure 5.5 represents such a process.

Given the two approaches stated earlier, the logical inductive approach (research then theory) stresses the left half of the wheel (starting with observations), while the logical deductive approach stresses the right half of the wheel.

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8This is the process that deductive reasoning follows. It provides explanation by having a set of propositions and then deducing that, if these propositions are true and certain other conditions are met, certain specific and observable events occur.


strongly among past owners but was also pervasive among people who were car enthusiasts but had not reached the income level where they could afford the car.

When reviewing the situation, keep in mind that this was not always a linear process as the distributor moved around the wheel. There was short-circuiting as different explanations, concepts, and facts were considered, evaluated, and accepted or rejected. There was a constant interplay between inductive and deductive thinking, with each playing a different but important role.

Logical Deduction: Problems and Prospects

There are a number of issues that must be raised when one is developing deductive explanations of marketing phenomena. These include causality, establishing tests for a theory, and getting the theory in the first place.

Causality

The issue of causality has long been debated in the social sciences. In our wheel example developed earlier, can we really say that higher perceived “store-customer” compatibility causes higher store patronage? Since this is a key area in both the deductive as well as inductive approaches to theory construction, Chapter 3 dealt with it in extensive detail.

Testing Theories in the Deductive Mode

Once a general theoretical statement has been made, the next step is to make a deduction and translate it into an empirical statement so that observations can be made and the “truth” of the statement tested. This testability of a statement is of extreme importance to logical deductive analysis.

Poyla and Stinchcombe outline the general logic of testing theories in the deductive mode. Referring back to the clothing store example, two situations could have developed when the perceived store-image-compatibility (SIC)/store-patronage (SP) relationship was tested.

that logical deduction seeks to “gradually eliminate invalid propositions and increase the number of useful, valid ones,” there could be other explanations for observing that some customers had higher SP scores and shopped at a particular store more often.

What might some of these alternative explanations be? One might develop a “restrictive distribution explanation.” It may be that people were not aware of or could not get to other clothing stores that carry this line of products. Rather than just a high compatibility of store image, the “real” reason they shopped at that particular store may have been a perception that they had no real alternatives. Thus, store patronage was high but this was based on market distribution factors rather than image factors. Sales were going down not because of a store image change but rather because new competition may have opened up in the area or new transportation facilities had been developed which allowed this particular target group to frequent previously inaccessible clothing stores.

The reader might try to develop other alternative theories which could explain the observations generated in the test. From your own intuition and knowledge, categorize them from most likely to least likely. That is, which of the theories you developed is the most likely alternative to our initial store image/diffusion theory?

This approach includes two related yet distinctive strategies: multiple tests of theories and testing different theories.

Multiple Tests

The strategy of multiple tests suggests that although we may never completely prove a theory, it can be made increasingly more credible by our testing the same theory in a variety of different situations:

<table>
<thead>
<tr>
<th>Situation I</th>
<th>Situation II</th>
<th>Situation III</th>
<th>Situation IV</th>
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<tbody>
<tr>
<td>A = B</td>
<td>A = B</td>
<td>A = B&lt;sub&gt;1&lt;/sub&gt;, B&lt;sub&gt;2&lt;/sub&gt;, B&lt;sub&gt;3&lt;/sub&gt;</td>
<td>A = B&lt;sub&gt;1&lt;/sub&gt;, B&lt;sub&gt;2&lt;/sub&gt;, B&lt;sub&gt;3&lt;/sub&gt;</td>
</tr>
<tr>
<td>B false</td>
<td>B true</td>
<td>B&lt;sub&gt;1&lt;/sub&gt;, B&lt;sub&gt;2&lt;/sub&gt;, B&lt;sub&gt;3&lt;/sub&gt; similar</td>
<td>B&lt;sub&gt;1&lt;/sub&gt;, B&lt;sub&gt;2&lt;/sub&gt;, B&lt;sub&gt;3&lt;/sub&gt; different</td>
</tr>
<tr>
<td>A false</td>
<td>A more credible</td>
<td>A substantially more credible</td>
<td>A much more credible</td>
</tr>
</tbody>
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Situation III would be described by testing the theory in a number of similar situations. For example, higher SIC scores might be associated with higher SP scores in a particular clothing store in a particular city (B<sub>1</sub>), but we could also deduce that this relationship might be true for different clothing stores in the same city (B<sub>2</sub>) or different clothing stores in different cities (B<sub>3</sub>). What other tests are similar in nature that you can think of to test this theory?

Situation IV generalizes the theory not only to different target populations but
The Most Likely Alternative Theory

Rather than focusing on the same theory and deducting observations in similar and different situations, we could test the same theory against an alternative theory. The "restricted distribution" theory was an example of such a theory. That alternative theories should be generated is not only a logical but a natural step to take. For example, given any particular business or marketing problem, how likely is it that the interested parties will agree on the same theory? Chapter 7, on reality tests, will show in greater detail that what different people will or will not regard as true varies. Different people are likely to have a different theory-in-use for the same business or marketing problem.

Faced with this situation, there are a number of strategies that can be used to eliminate alternative theories using deductive logic. The first derives from the following logic: if we say our theory implies higher SP scores and an alternative theory implies lower SP scores, then if higher SP scores are observed the alternative theory is falsified. In fact, what you could do is develop a number of likely alternative theories, all of which imply lower SP scores.

- A (our theory) and (F, G, H . . . other theories) imply higher SP scores.
- (C, D, E . . . likely alternative theories) imply lower SP scores.
- If we observe higher SP scores, then by classical logic C, D, E . . . are false and A (our theory) is more credible.

Thus, this test eliminates several possible alternative theories. However, there were other theories that also implied high SP scores—including the "restricted distribution" theory—that were made more credible by the test. How are these evaluated and tested?

The next step is to develop implications of these remaining theories that are very different from one another—different in the sense that "there is almost no overlap between the theories that imply the one empirical and the theories that imply the other." For example, the "restricted distribution" theory would not only imply higher SP scores but also imply that people were not aware of or could not visit other stores. The store image compatibility theory implies that people are aware of and could have visited other competitors' stores. Therefore, if we observe that people were aware of and could have visited other stores then we reject the "distribution" theory even though both explanations predict higher SP scores.

The general approach to ruling out alternative likely theories is the following:

- A (a theory) implies certain empirical observations B₁, B₂.
- C and D are alternative theories that imply that either or both B₁, B₂ will not occur.
  - e.g., C = B₁ but not B₂,
  - D = B₂ but not B₁,
- Therefore if B₁ and B₂ do occur, then C and D are false and A is substantially more credible.

To summarize, the basic approach of the logical deductive mode is "the elimination of alternative theories by investigating as many of the empirical consequences as is practical, always trying for the greatest possible variety in the implications tested."

The elimination of rival or competing alternative hypotheses is an important strategy. However, a serious risk is encountered where this approach is followed automatically. Many hypotheses considered to be rival hypotheses may actually be quite compatible were a previously unspecified variable considered. Certain values of this variable may make one hypothesis correct and another incorrect while other values of the variable may result in the opposite. The failure to be imaginative in locating such variables or at least the failure to ask whether apparent competing hypotheses cannot both be correct under certain conditions not only prevents the enrichment of an explanation by adding concepts but may impoverish explanations by eliminating some hypotheses which might have validity. The rather partisan nature of science encourages us to prove our theories while disproving other people's theories. This is not necessarily unhealthy or inappropriate. However, neither should it be undertaken without first determining whether possible compatibility exists.

"Stinchcombe, op. cit., p. 21.

"Ibid., p. 22."
Summary

This chapter has attempted to show the differences between deductive and inductive logic, while stressing that, although these approaches to theory construction are different, they can be seen as part of the same theory construction "wheel."

Approaches to using deductive logic must place particular emphasis on the tests that can be used in verifying and falsifying alternative explanations as well as generalizing a particular explanation.

SIX

CONSTRUCTING THEORIES-IN-USE

Throughout this book we have been urging an eclectic approach to the creation of theories about marketing phenomena. Different approaches have their own advantages. No single approach is inherently superior. However, in this chapter we feature one particular approach, not because it produces inherently more valid and more reliable information than any other—it is not at all clear that it does. Instead, we feature the theory-in-use approach partly because it produces different kinds of insights than more conventional approaches and partly because it is an approach the reader is not likely to encounter in a formal sense. The basic message we want to convey is that people’s "theories" about their own behavior may offer special insights to the researcher that other approaches do not yield. A theory-in-use approach might fruitfully be added to but not substituted for other approaches.