CHAPTER 3

CRITICAL THINKING ABOUT POLITICS

Analytical Techniques of Political Science—The Logic of Hypothesis Testing

As we pointed out in chapter 1, comparative politics is a subfield of political science. Political science, in turn, is a science to the extent that its practitioners engage in the tasks of *definition, description, explanation, probabilistic prediction,* and *prescription*. This chapter explains how we can apply these scientific operations to the study of politics. The first part defines important terms and provides examples of how they are used. The second part walks you through a hypothesis-testing exercise, using a step-by-step procedure that is utilized in all the chapters that follow. Both parts demonstrate how the logic of scientific analysis can help you understand reality, enhancing critical-thinking skills that you can apply in a variety of academic and professional contexts. As a major leaguer once said about baseball, "Ninety percent of this game is half mental."

I. ANALYTICAL TECHNIQUES OF POLITICAL SCIENCE

Ought-Questions and *Is*-Questions

As a general rule, political science asks two broad types of questions: *is*-questions (What *is* political reality?) and *ought*-questions (What *ought* to be done about political reality?). The two sets of questions are intimately related: we cannot adequately determine what we ought to do through practical political activity without a thorough comprehension of the realities we are facing. *Good policy prescription requires good analysis!* We must always keep in mind, however, that is-questions and ought-questions are basically different. Is-questions concentrate on *facts* and *explanations* of facts, whereas ought-questions mostly deal with *personal preferences* and *values*. The systematic analysis of facts is called *empirical analysis*. This chapter is mainly concerned with the logic of empirical analysis. Before we move on to that subject, however, we need to clarify the relationship between is-questions and ought-questions a bit further.

Ought-Questions and Policy Prescription

Because one of the purposes of studying comparative politics is to decide what we ought to do through political action, comparative politics is, at least in part, a *policy science:* it helps us devise and select governmental policies aimed at improving things. In this sense, comparative politics can be used to serve *prescriptive* and *meliorative* purposes: it helps us choose the right policy prescriptions with the aim of making the world a better place.

(The Latin word *melior* means "better.") One of the problems with determining what ought to be done in politics, of course, is that people often disagree over personal preferences and values. Although we can use the analytical tools of science to dig up facts and explain how they fit together, science cannot determine the rightness or wrongness of *value judgments*.

Value judgments ***are evaluations that we make on the basis of values, standards, or ideals.*** They are based on such things as ethical principles, aesthetic standards, or personal tastes. Value judgments thus reflect personal preferences about what is moral or immoral, beautiful or ugly, good or bad. Value judgments are not simply statements of fact, nor are they explanations of how various facts come about or interact. When we say, "Democracy is morally superior to authoritarianism," we are making a value judgment. When we say, "In today's world there is a trend toward more democracies," we are making a statement of fact, not a value judgment.

In principle, facts and explanations can be proved or disproved as true or false with reference to the facts themselves. We can look at reality and see if there is—or is not—a trend toward democracy, for example. Facts are independent of the individual observer and are therefore considered *objective* (that is, they are the *object* of the individual's observations). But value judgments cannot be proved or disproved as true or false. They represent the *preferences* or *ideals* of the individual and are therefore considered *subjective* (that is, they are rooted in the mind of the individual *subject*). We can study the origins and development of democracies objectively by examining the relevant facts. But whether you or I prefer liberal democracy to social democracy, or the Republicans to the Democrats, may involve a considerable amount of subjective preference.

Although is-questions and ought-questions are different, they are frequently related. Political arguments resting on value judgments cannot be completely oblivious to knowable facts. If we want to argue that democracies are morally superior to dictatorships *because* they maximize political participation, freedom, and human dignity, we had better be sure that democracies in fact really do these things. If someone can point out that democracies have at times permitted the majority to dominate and exploit a minority (as occurred in the United States when slavery was permitted), we may have to modify our position to take account of this factually verifiable reality. The facts may force us to admit that democracy does not necessarily maximize freedom and dignity in all cases. It may do so only when specific measures are taken to prevent the majority from subjugating the minority. By the same token, apologists for authoritarianism who argue that an enlightened dictator may know better than the masses what is best for the country must acknowledge the fact that dictatorships are often characterized by brutality, corruption, and economic stagnation.

It can be quite disconcerting to change our cherished political opinions in the face of contradictory evidence, no matter how indisputable the evidence might be. But a scientific approach to politics may sometimes force us to make that change. Learning how to adjust our political views to verifiable realities may be difficult at times, but it is one of the principal purposes—and benefits—of studying politics scientifically.

Within the academic traditions of political science, ought-questions are the special province of two fields of the discipline: *political philosophy* and *public policy analysis*.

Political philosophy, which is also called *political thought*, is perhaps the oldest form of systematic thinking about politics. Its roots in the Western tradition go back to ancient Greece and such thinkers as *Plato* (427–347 B.C.E.) and *Aristotle* (384–322 B.C.E.). Non-Western philosophers like *Confucius* (557?–479 B.C.E.) and religious visionaries like *Muhammad* (570–632) have also propounded ideas about life and society that have had a profound impact on political developments around the world down to the present day. For most political philosophers, the central question of political philosophy has traditionally been, "What is the best form of government?" This broad question has inspired a chorus of related ones: "What ought to be the main goals of political action: freedom? order? equality? justice?" "How do we define these goals in practical circumstances?" These and similar questions are characterized above all by their concern with political values and with optimal standards of political organization and behavior. Such values and

standards are called *norms*. Consequently, the field of political philosophy is also called *normative political theory*.[1]

Public policy analysis is the other subfield of political science that is primarily concerned with ought-questions, but it also employs a lot of empirical analysis to assess the impact of policy decisions. *Public* policy essentially means *governmental* policy. Public policy analysis is concerned with the decisions that governments make (or should make) in order to reach certain goals. Public policy analysts who pursue their careers in government agencies or in nongovernmental organizations, such as public watchdog groups, take a hard look at specific issues such as health care, homeland security, or defense policy, and propose specific governmental programs or decisions. Once policies are adopted through the political process, these analysts monitor the results and recommend pertinent adjustments and corrections. These tasks require strong analytical skills as well as a personal dedication to improving government performance.[2]

This textbook concentrates on comparative politics, not on political philosophy or public policy analysis per se. But comparative politics cannot be properly understood in isolation from some of the leading traditions of political thought. We cannot understand such prominent features of the contemporary world as democratization or political culture unless we examine their normative foundations in the thought of various political philosophers, even though some of them may have lived hundreds or even thousands of years ago. We are also interested in various public policy issues confronting the governments of the world, such as economic policies, women's issues, and immigration. By studying public policy comparatively, we may be able to figure out what our own government ought to be doing in grappling with similar problems.

"WHAT IS?": A GUIDE TO EMPIRICAL POLITICAL ANALYSIS

In addition to being interested in what people ought to do in the realm of politics, political science is concerned with *describing* and *explaining* political realities. To this end it takes a close look at the facts of political life and searches for patterns or relationships that help explain the facts. What is democracy and how does it work? What is a military dictatorship? Why does it tend to occur in some countries but not in others? Questions such as these probe the *what*, the *how*, and the *why* of political reality.

> **Empirical analysis** ***is centered on facts. It seeks to discover, describe, and explain facts and factual relationships, to the extent that the facts are knowable.***

The term *empirical* derives from the ancient Greek word for *experience.* Empirical analysis is based strictly on what we can experience or perceive through our senses: namely, *facts.* Empirical analysis is not concerned with our values, ideals, or preferences. It does not make value judgments. And it cannot probe spiritual phenomena, such as God or the human soul. We cannot empirically prove or disprove God's existence or demonstrate the intentions or actions of any deity.

At least in principle, when we study politics empirically we are supposed to put aside our personal preferences and religious faith and just stick to the observable facts. As a consequence, empirical political science is sometimes called *value-free* political science: it requires us to keep our investigations of political reality free from our own particular values and biases, no matter how well-intentioned or well-reasoned our convictions may be. If we favor democracy, for example, we must not allow this preference to intrude into our efforts to understand how democracies work in actual fact. Otherwise, we may blind ourselves to certain realities about democracies that we may find unpalatable. The same admonition applies to adherents of all political persuasions. In practice, however, it can be quite difficult to keep our subjective inclinations completely separate from our fact-centered analyses. Personal values and preferences sometimes creep into the way we select the topics we are interested in and the ways we look at them. But the canons of science require us to acknowledge our biases and make sure that they do not get in the way of our quest for objective truth when conducting empirical investigations.

The principal approach of this book is empirical. Its main purposes are to present and explain facts

about politics and to teach you various ways of analyzing political reality from an empirical perspective. At the same time, the authors freely acknowledge that we are not unbiased. To put our cards on the table, we unabashedly proclaim that we favor democracy over any known form of authoritarianism. Though we may differ among ourselves about how to promote democracy in the world or how democracies should be run in actual practice, we favor democracy as a general principle because it provides far more opportunities for human dignity and self-expression than authoritarian regimes, which either limit these opportunities substantially or deny them altogether. Beyond this normative commitment to the principle of democracy, we agree and disagree on a wide range of political issues. Nevertheless, we make a sincere effort in this volume to be as objective as possible in presenting comparative politics as an empirical science.

Definition

All sciences must strive for definitional clarity. Unless we are clear about the terms we use, we may end up in a conceptual muddle. The same terms may mean different things to different people, or they may have several different meanings depending on the context in which they are used.

As political scientists, we must define our concepts and refine our definitions so that they apply to reality as accurately as possible. A *concept* is a word, a term, or a label that applies to a whole class or category of phenomena or ideas. In political science, such terms as freedom, power, democracy, liberalism, conservatism, socialism, and globalization are concepts whose meanings need to be spelled out carefully so that we can talk about them intelligibly and consistently. Like many political concepts, each of them can be defined in more than one way. For James Madison and the framers of the U.S. Constitution, for example, freedom meant above all freedom from the tyranny of an excessively powerful state and freedom to engage in private economic activity. For Karl Marx, however, it meant freedom from economic exploitation by private industrialists. In early twentieth-century Germany, a conservative was a staunch opponent of democracy who favored a militarily powerful authoritarian state. Conservatives in contemporary Germany, by contrast, favor both democracy and civilian control over the military. Conceptual clarity is imperative whether we are discussing political values (e.g., freedom) or describing political facts (e.g., German conservatism). Achieving such clarity is one of the main tasks of political science.

Description: Observing, Collecting, Comparing

Natural scientists must look very closely at natural phenomena, record their observations, and gather them together in some systematic fashion. One of the oldest ways of studying the natural world has involved the *comparative method*. Biologists, for example, compare various forms of animal and plant life and group them into categories such as kingdom, genus, and species. In a roughly similar manner, political scientists examine systems of government, describe their similarities and differences, and classify them in various categories. Starting with democracy and authoritarianism as the two broadest categories, we can group different types of democracy under the first rubric and different forms of authoritarian government under the second. Gabriel Almond, a pioneering figure in the study of comparative politics, once suggested that it is especially useful to look for *dissimilarities* between *similar* forms of government (such as democracies) and *similarities* between *dissimilar* forms of government (such as democracies and non-democracies). By employing these descriptive and comparative techniques, we can get a better understanding of how governments work—and ought to work.

The precise methods we use to carry out our observations and comparisons will vary from case to case. If we are interested in the way people vote, we will want to gather election returns as well as relevant information about the voters, such as their social class, religion, ethnicity, and the like. If we want to understand how political elites view politics, it may be helpful to conduct interviews with relevant officials, such as parliamentarians or bureaucrats, to see how they perceive politics and their own role in political affairs. To increase the breadth and depth of these observations, we may want to examine voting patterns or elite attitudes in a variety of

countries over extended periods of time. The more information we observe, the more likely patterns will emerge that will permit us to go beyond merely describing reality. It will then be possible to make generalizations about reality with the aim of explaining it.

Explanation and Generalization

Are Americans increasingly fed up with their political parties? Are similar tendencies occurring in other democracies? If so, then why? Do political leaders in democratizing countries share similar conceptions of human rights or do they differ? What accounts for these similarities or differences? Are these attitudes conducive to stabilizing democracy or might they tend to undermine it?

Questions like these take us beyond merely isolated facts about politics in this or that country, however intriguing they may be. They prompt us to generalize from those facts in order to gain a broader perspective on political reality. By themselves, facts are not especially meaningful. (As one wag put it, "History is just one damned thing after another!") The facts of political life assume meaning only when we visualize them as general patterns, tendencies, or relationships.

Therefore, if we want to understand the significance of discrete facts or events in political life, we must integrate them into larger analytical frameworks. Today's headlines, for example, may announce that the prime minister of a major democratic country has resigned, that the government's central bank in a leading trading nation has just raised interest rates, and that the military in a country struggling to establish democracy has seized power in a coup d'état. Governments, private businesses, journalists, and other interested parties around the world must pay instant attention to these occurrences and assess their implications for decision makers or average citizens. As political scientists, we too may be interested in the immediate practical effects of these events. But we will also be interested in what they tell us about politics more generally.

What does the prime minister's resignation tell us about how democracies work? What does the central bank's actions tell us about the relationship between politics and economics? What does the latest coup tell us about military intervention in politics? Our aim here is to deepen our understanding of democracy in general, political economy in general, and military authoritarianism in general. *Generalization is a central purpose of science*. At the same time, we can apply our understanding of these general processes and tendencies to sharpen our understanding of the specific events at hand.

In order to construct meaningful generalizations from a wealth of political information and in order to determine how accurate these generalizations are, we must use scientific methods of analyzing facts and testing general propositions. Many students of science maintain that *the essence of science lies in its methods of analysis*.[3]

Analysis is simply the quest for understanding through close observation and broad generalization. In pursuit of this objective, scientific analysis has a toolbox of concepts and procedural operations. *Variables, correlations, laws, theories, hypotheses, models*, and *paradigms* are some of the most important ones, and they are particularly important in political science. What follows is a brief explanation of each of these terms, coupled with some elementary examples of how they can be employed in political science.

Variables

> ***A* variable *is something that can vary or change. That is, it can take* different forms *or be a* changeable characteristic *of a phenomenon.***

Suppose we want to understand democracy. Democracy has many different characteristics that can vary or come in different forms. For example, there are *stable* democracies that endure over long periods of time with few major alterations (such as the United States); there are *unstable* democracies that experience frequent changes of government (like Italy, which has had more than sixty governments since World War II) or that alternate over time with nondemocratic modes of government (like Brazil, which has alternated between democracy and dictatorship). *Stability* is thus a characteristic of democracy that can vary. We can focus on stability as one among several variables about democracy that can be analyzed systematically. We can define exactly what we mean by stability and instability, we can collect information on stable and unstable democracies, compare different cases of

each variant, and look for possible explanations of why some democracies are stable and others are not. The factors that account for stability or instability are also variables. For example, we may find that, of all the possible characteristics of a given country, national wealth is the variable that best explains democratic stability: rich democracies may turn out to be the most stable, poor ones the most unstable.

Suppose we want to figure out why people vote the way they do. The choices voters make can vary. People can vote for different parties or candidates, or they can stay home and not vote at all. The voters themselves also have variable characteristics. The electorate consists of different social classes, ethnic groups, religions, and other social categories. Like election-year political consultants, we can systematically gather information on all these variables and analyze the extent to which the various characteristics of the electorate account for the population's electoral choices.

Just about any general topic in political science has characteristics that can vary, such as types of government (e.g., democracy, authoritarianism), governmental institutions (e.g., unicameral and bicameral legislatures), or the political behavior of people (e.g., mass voting behavior, elite decision-making behavior). When we engage in the scientific study of politics, it is variables like these that occupy our direct attention. In some cases we may wish simply to observe these phenomena, collecting information about them and perhaps classifying them in some way. Things get especially interesting, however, when we find relationships between two or more observed variables.

Is there perhaps a relationship between democratic stability and a country's level of economic development? (Are stable democracies predominantly rich countries? Are poor countries doomed to authoritarianism?) Is there a relationship between voting for conservative candidates and the voters' income level or religion or ethnic group or gender? (Do upper-income voters, whether in the United States or other countries, tend to vote mainly for conservatives?) One of the first ways of generalizing about politics is to look for relationships of these kinds.

Dependent and Independent Variables Whenever we are looking for patterns or connections between two variables, one variable is the *dependent variable* and the other is the *independent variable*.

> ***The* dependent variable *is the variable we are most interested in examining or explaining; it is the main object of our study. It is the* effect *or* outcome *that is influenced or caused by another variable or variables. It is the variable whose value changes in response to changes in the value of other variables (viz., independent variables).***

Let's say that we are interested in understanding voting behavior in the United States and other democracies. One variable characteristic of voting behavior is *turnout*, the number of people who turn out to vote. Some voters go to the polls but others stay home. Electoral statistics over the past fifty years show that Americans tend to vote at consistently lower rates than West Europeans. What explains these differences? Are there any patterns we can find that might be associated with the level of voter turnout? Put another way, on what factors is turnout *dependent*? Turnout is thus our *dependent* variable. It is the variable we seek to explain; we want to see what it *depends* on.

> ***The* independent variable *is the factor or characteristic that influences or causes the dependent variable. In cause-and-effect relationships, it is the* causal *or* explanatory variable. *Changes in the value of the independent variable may produce changes in the value of the dependent variable.***

In our hypothetical study of voting behavior, the independent variables are various characteristics of the electorate that may help account for variations in voter turnout. These characteristics would include income level, age, education level, ideological proclivities, and other pertinent factors. For example, low-income voters may be less inclined to vote than upper-income voters; younger voters may be less inclined to turn out than older ones; and so on. Independent variables could also include different attitudes about politics, as evidenced in public opinion surveys. Some people may not vote because they believe their vote doesn't really matter and that voters can't change anything for the better; they therefore have a low sense of *political efficacy* and feel alienated from the political system. By contrast, others may have a high sense of political efficacy: they believe that "every vote counts" and that voters can in fact influence

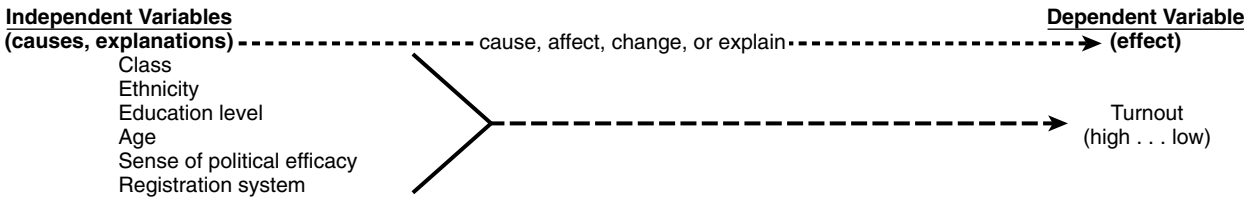

FIGURE 3.1 Independent and Dependent Variables

politicians to make desirable decisions while in office. Turnout might also hinge on registration procedures: it may be higher in countries where registering to vote is easy and lower where it is more inconvenient (as in the United States). Just about anything that might affect turnout can be an independent variable in our investigation. Figure 3.1 illustrates these variables.

In short, in the statement "A causes B," A is the *independent variable* and B is the *dependent variable.* B is dependent on A.

We can try out our independent variables individually to see to what extent each one is associated with our dependent variable, or we can try different combinations of independent variables. For example, we can focus first on the relationship between ethnicity and turnout in the United States, examining turnout levels for whites, blacks, Asians, Hispanics, and so on. We can do the same for the income-level variable, the religious variable, and so on. In these instances we are engaging in *single-variable analysis.* We can also examine two or more independent variables in combination against the dependent variable (e.g., rich whites, poor blacks; Protestants who attend church regularly and Protestants who do not attend church regularly, and so on). Such analyses are *multivariable analyses.*

Our aim in this study is to determine whether, or to what extent, there are any connections between the independent variables and our dependent variable, voter turnout. Such connections between variables are called *correlations*, or *associations*.

Correlations

A* correlation *(or* association*) is a relationship in which two or more variables change together.

Correlates are variables that are associated with each other in some way. For example, such things as a high level of national wealth, a large middle class, and a well-educated populace are often correlates of democracy: as a general tendency they go together with democratic forms of government.

Variables are positively correlated when they vary in the same direction. Two variables are positively correlated when they go up or down together (i.e., they *increase together* or *decrease together*).

If our variables are quantifiable, we can plot them on a graph. Usually we plot the dependent variable along the y-axis (vertical axis), and the independent variable along the x-axis (horizontal axis). Let's measure the relationship between turnout and the electorate's income levels in a hypothetical country. Figure 3.2 illustrates a *positive correlation* between the voters' income levels (the independent variable) and the percentage of people who turn out to vote (the dependent variable). The higher the income level, the higher the turnout; the lower the income level, the lower the turnout. Eighty percent of people in the highest income bracket turn out to vote, but only 5 percent of the people in the lowest income level show up at the polls. Note that when the correlation is positive, the plotted line goes from bottom left to top right.

Variables are inversely correlated when they vary in opposite or reverse directions. In quantitative terms, an inverse correlation occurs when one variable *increases* and the other variable *decreases*, or vice versa. We can grasp an inverse correlation rather easily by looking at the relationship between turnout (the dependent variable) and the voters' sense of *alienation* from the political system (the independent variable). (Alienation means a low sense of political efficacy and a basic distrust of politicians and government officials.) As figure 3.3 illustrates, voters with the lowest sense of alienation have the highest turnout rates; voters with the highest sense of alienation have the lowest turnout rates. Thus there is an *inverse correlation*

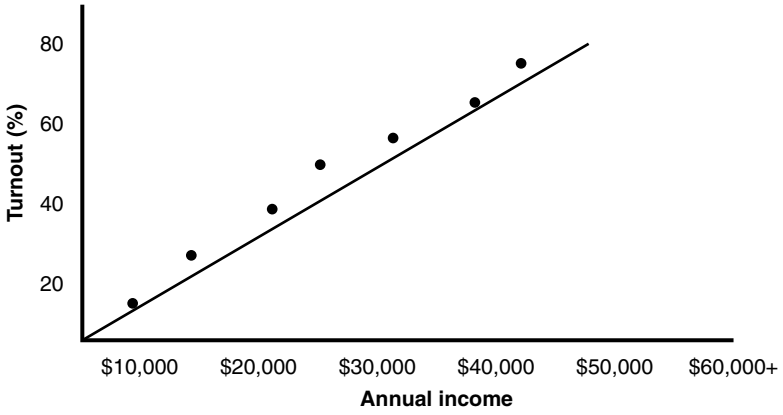

FIGURE 3.2 Positive Correlation Between Income Levels and Turnout

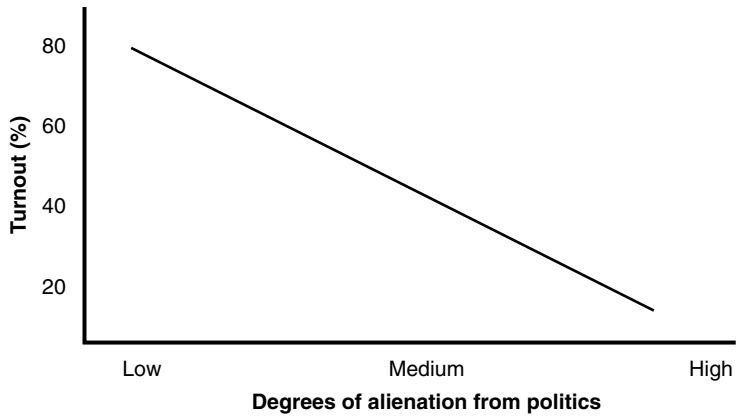

FIGURE 3.3 Inverse (Negative) Correlation Between Alienation and Turnout

between alienation and turnout. Inverse correlations are also called *negative correlations*. Note that when the correlation is negative, the plotted line goes from top left to bottom right.

In some cases we cannot chart quantifiable degrees of variation on a graph, but we can display different examples of the variable on a *histogram*. Figure 3.4 shows the relationship between turnout and voter registration in the United States. Because we cannot distinguish among different magnitudes of "registered-ness," we cannot plot variations in turnout rates *within* these two groups. The histogram compares the percentage of registered voters who have turned out to vote in elections to the House of Representatives with the percentage of all potential voters—registered and unregistered—who have turned out.

Conceivably, we could undertake a different research project by taking one of the independent variables just listed and making it our dependent variable. Suppose, for example, we are primarily interested in focusing on the phenomenon of political alienation: what factors might affect or cause it? In this study, political alienation becomes the dependent variable, and we then try out various independent variables to see if they are correlated with it. To what extent (if any) is political alienation dependent on race or ethnicity? on religious orientation? on income level? on education level? on psychological factors? on other variables? on some combination of variables? Figure 3.5 shows a negative (inverse) correlation between alienation (the dependent variable) and education level (the independent variable). The less educated people are,

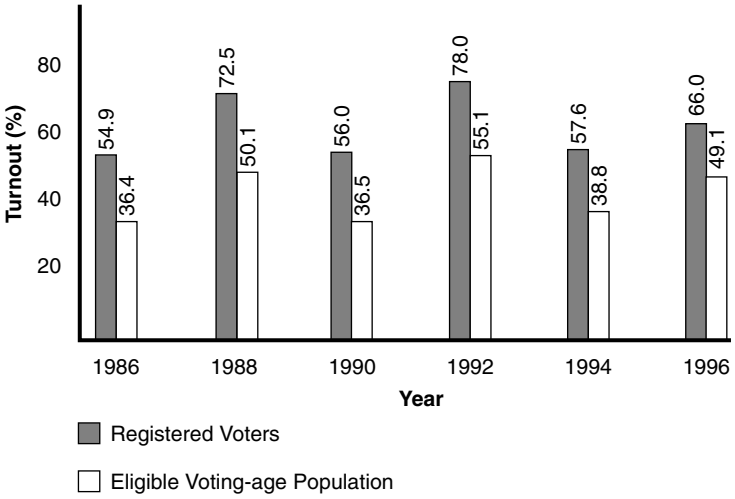

FIGURE 3.4 Histogram Comparing Turnout Rates of Registered and All Potential U.S. Voters (Elections to House of Representatives, 1986–96)

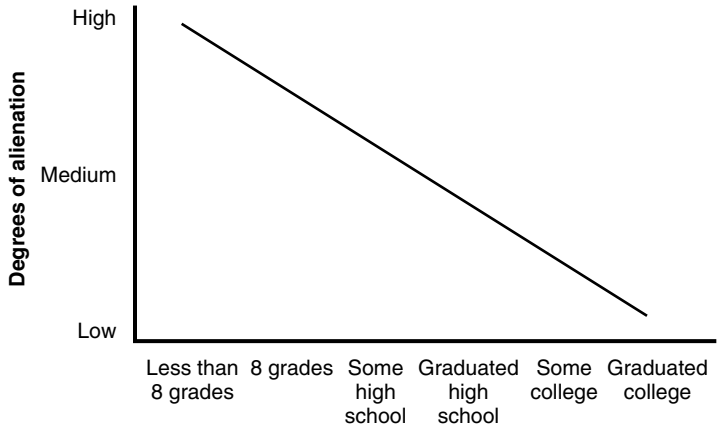

FIGURE 3.5 Correlation Between Alienation and Education Level

the higher their sense of alienation; the more educated people are, the lower their sense of alienation. Our point here is that, depending on the main focus of our analysis—that is, the main *effect* we wish to understand or explain—alienation can be either an independent variable or a dependent variable. Many other variables can also be used either way.

Keep in mind that *correlations are not explanations.* Even though our data may show a clear correlation, positive or negative, between the dependent and independent variables, they do not explain *why* the variables are related. Let's take another look at figure 3.2, which shows a positive correlation between voter turnout and income levels. *Why* do higher-income people vote at higher rates than less well-off citizens? We cannot get answers to this question just by looking at the graph depicting the correlation.

To find out why higher-income voters come out on election day at higher rates than the less well-to-do voters do, we will have to extend our investigations by conducting surveys of voter attributes and attitudes. These surveys may reveal that wealthier citizens tend to be better educated than

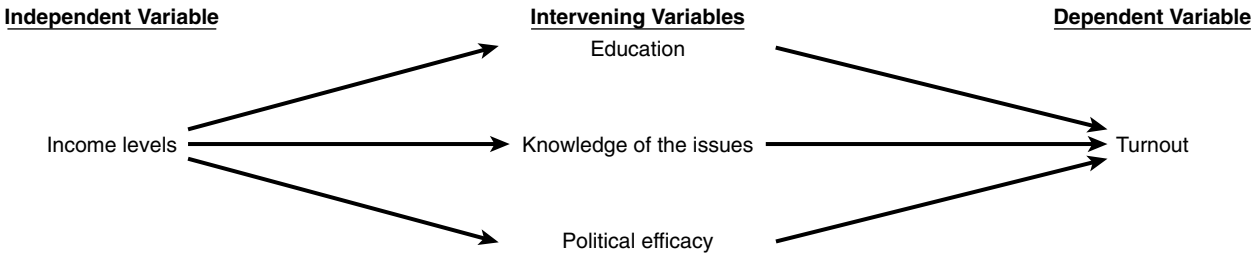

FIGURE 3.6 Intervening Variables

poorer ones and thus more knowledgeable about political issues. They may also have a higher sense of their own political efficacy, that is, their ability to have a real impact on government policies. The surveys may further reveal that poor citizens tend to be poorly educated, display less knowledge of the issues of the day, and have a markedly lower sense of political efficacy. These results suggest that income levels (the independent variable) affect election-day turnout (the dependent variable) by working through such intermediary factors as education, knowledge of the issues, and a citizen's sense of political efficacy. These intermediary factors are called **intervening variables.** As figure 3.6 shows, intervening variables ***are located in between the independent and dependent variables.***

As a general rule, *correlations do not prove that one variable* (i.e., income level) *actually* causes *the other variable* (i.e., voter turnout). In other words, *correlations do not conclusively demonstrate* causality. All a correlation does is suggest or imply that there *may* be a cause-and-effect relationship between the variables under observation. Of course, in order to show that a causal relationship does in fact exist, it is first necessary to demonstrate that a correlation exists. Correlations are *necessary* to demonstrate causality, but by themselves they are not *sufficient* to do so.

Sometimes variables may be positively or negatively correlated but it turns out on further investigation that there is no direct cause-and-effect relationship between them. We then have a *spurious correlation*.

One type of spurious correlation occurs when there *appears* to be a correlation between the variables but in fact no real relationship of any kind exists. One of the most famous examples concerns the fairy tale that babies are delivered by storks. The story comes from actual statistical data from northern Europe that showed an increase in human births whenever stork births increased. When stork births declined, so did human births. No one ever came up with any verifiable explanations as to why human and stork birthrates were positively correlated. Obviously, the one event could not have caused the other, but neither was there any evidence that some other variable (climactic patterns? lunar cycles?) caused the two birthrates to rise and fall together. Until someone brings forward convincing evidence of a causative variable, we can assume that the correlation between human births and stork births is entirely fortuitous. Thus a spurious correlation can at times be a matter of pure coincidence, with *no* causal factors at work.

In other circumstances, a spurious correlation can be said to exist when two apparently correlated variables (let's say A and B) are not *directly* linked in a cause-and-effect relationship (A does not cause B, and B does not cause A); rather, they are *indirectly* linked because some other variable is causing one or the other, or both (C causes both A and B, or just one of them). In other words, the stork-and-baby correlation would still be considered spurious even if it could be shown that some third factor (like climactic patterns) caused the two infant populations to increase and decrease together.

> ***In sum, a* spurious correlation *occurs when two variables appear to be directly linked in a cause-and-effect relationship but in fact (a) there is no causal linkage whatsoever, or (b) they are linked indirectly by some other causative variable or variables.*** Figure 3.7 depicts the logic of spurious correlations.

As political scientists we must constantly be on guard against spurious correlations when conducting or examining scientific research. We should be similarly vigilant as citizens. In the rough-and-tumble

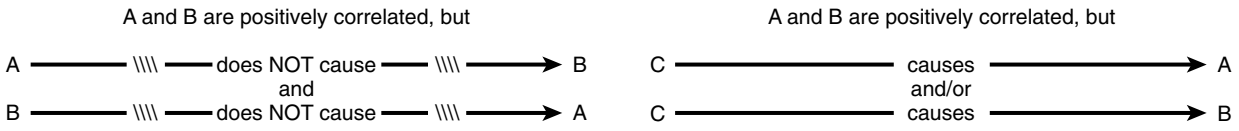

FIGURE 3.7 Spurious Correlations

world of politics, it is commonplace for politicians seeking to oust their opponents from office in the next elections to blame the incumbents for virtually everything that has gone wrong in the country during the government's term in office. In some cases, the elected officials may indeed be responsible for the problems they are accused of creating. But not always. It could happen, for example, that a downturn in the national economy that occurs when the Freedom Party is in power actually had its causative roots in policies pursued several years earlier when the Independence Party was in office. The correlation between the Freedom Party's incumbency and the deterioration of the economy is spurious because a third variable, the Independence Party, actually caused the economic tailspin.

Alternatively, it could happen that the actions of neither party were responsible for the economic decline. Other factors over which the two rival parties had little or no control while in office may have been at fault, such as unfavorable international economic conditions or the effects of disastrous weather on the national economy. Examples of spurious correlations in the real world of politics are rarely in short supply.

Laws

In science, a law is a regularly occurring association (or correlation) between two or more variables.

A *deterministic law* means that whenever X occurs, Y *always* occurs. The laws of gravity are an example. Starting with the simple observation that what goes up *must* come down (at least within the Earth's atmosphere), Sir Isaac Newton showed with mathematical precision that physical bodies have a general tendency to be pulled toward one another in patterns determined by their mass and distance. Albert Einstein's famous equation, $E = mc^2$, is a law specifying that energy *always* occurs as the product of mass times the square of the speed of light. The physical world has a number of deterministic laws, many of them translatable into timeless mathematical equations. As Einstein put it, "God does not play dice with the universe!"

A less stringent type of scientific law is a *probabilistic law.* In this case, whenever A occurs, B *sometimes* occurs. Occasionally we can calculate the *degree of probability* with which B is likely to occur. In the natural world, weather predictions are frequently based on probabilistic laws. Given certain temperatures, humidity levels, and other atmospheric conditions, we can predict when snow will probably fall. Depending on the accuracy of our weather data and the sophistication of our computer models, we may be able to make accurate forecasts with a very high degree of probability. Nevertheless, so many variables are at work that we cannot be absolutely certain when it will snow, or if it does, we cannot be completely sure how much will fall on which spots.

Human behavior is not as law-bound as inanimate nature. Unlike the planets or atomic particles, human beings are capable of conscious volitional behavior and completely erratic irrational behavior. We can make decisions about how we wish to behave by choosing from a menu of alternative courses of action. We can change our minds. We can act singly or in all sorts of groups. We can act cooperatively or at cross-purposes. Moreover, our social or political behavior can be affected by a multitude of variables (our ethnic group, religion, economic interests, parents, peers, etc.). Sometimes we miscalculate, acting on the basis of false assumptions, inadequate information, or faulty logic. Sometimes we may not even be consciously aware of the factors that induce us to behave in certain ways, as when our biases, emotions, or subconscious impulses intrude on our actions.

As a consequence, human behavior is extremely variable and unpredictable. Hence the social sciences, which focus on human behavior (especially in large social groups), cannot predict the future with unfailing accuracy. Whereas the planets and

other celestial bodies obligingly conform to the laws of gravitational motion, making it possible to pinpoint with mathematical precision the position of the moon or Halley's comet hundreds or even thousands of years from now, human behavior is so variegated that no one can foretell what political, social, or economic realities will look like ten years from now or even ten months from now. Perhaps for this reason Einstein also declared, "Politics is more difficult than physics."

Hence there are no *deterministic* laws in political science. Nevertheless, in political science as in other social sciences (such as sociology, economics, and social psychology), researchers can frequently discern real patterns and tendencies in human social activity. And even though we cannot foretell with any degree of certainty exactly what the future will bring, social scientists can sometimes suggest which future developments are more probable or less probable, at least in the near term.

Prediction of the future in the social sciences is thus suggestive or *probabilistic* in nature. If we can identify regularities in a population's voting patterns, for example, we can *suggest* how people *may* vote in the next elections. The closer we get to election day, the greater the confidence we may have in our estimation of *probable* outcomes. Even the most sophisticated statistical analyses of the most comprehensive polling data we can obtain, however, may not be sufficient to predict the way people actually will vote the very next day. Many pollsters were as surprised as virtually everyone else by Harry Truman's upset victory over Thomas Dewey in 1948, and most statistical models predicted that Al Gore would beat George W. Bush in 2000.[4] Similarly, experts on the Soviet Union were shocked at the USSR's complete collapse in 1991; veteran China-watchers did not foresee the eruption of pro-democracy student demonstrations in Beijing in 1989; and specialists on South Africa could scarcely have predicted in the early 1980s that the white minority would finally allow multiracial elections to take place there in the early 1990s, bringing Nelson Mandela, a black man, to the presidency.

Only in a suggestive and probabilistic sense, therefore, can we speak of laws in social science. Actually, social scientists rarely use the term *law* at all. In a few cases, they apply the term to certain patterns of social behavior that occur with considerable frequency and in a relatively regularized manner. Even these cases, however, are probabilistic rather than deterministic laws.

> In economics, for example, the *law of supply and demand* states that, as a general rule, prices in a market economy will rise whenever the supply of goods is low or the demand for goods rises. Conversely, prices tend to fall whenever supply increases or demand declines. Thus, prices are positively correlated with demand and negatively correlated with supply.
>
> In political science, *Duverger's law*, named after a French political scientist, stipulates that an electoral system in which the voters choose competing candidates by a simple majority (i.e., the highest number of votes) in a single ballot tends to produce a two-party system. Examples would include elections to the U.S. House of Representatives and the British House of Commons.

Just about every scientific law has its exceptions, as even natural scientists acknowledge with respect to nature. This reality is especially true in the social sciences. Economists recognize that the law of supply and demand, although a general tendency, does not always operate perfectly. Even in a market economy, factors such as monopolies or fluctuating consumer demands may interfere with it. Similarly, Duverger's law may not apply in all circumstances, as Duverger himself acknowledged. (Britain, for example, has more than two parties represented in the House of Commons.)[5] Any so-called law in the social sciences must be constantly put to the test against the evidence of reality to determine whether, or to what extent, it holds true. In social science as in the physical sciences, laws are occasionally broken.

Moreover, laws—like correlations—are not *explanations.* They simply point out that two or more variables generally go together, but they do not explain why. To find out why these patterns exist, social scientists must conduct other exploratory investigations. The principal ways of explaining political realities scientifically are by formulating *theories* and *hypotheses*.

Theories The term **theory** can have several different meanings in political science.

1. In its broadest sense, theory simply refers to ***thinking about politics as opposed to practicing***

it. As such, it is an ***abstract intellectual exercise.*** Theorizing can mean nothing more than ***making generalizations*** about politics ("Majorities always discriminate against minorities!"), whether in accordance with strict scientific rules ("And I can prove it!") or far more informally, as in late-night political discussions with friends ("Now don't try to reason with me!").

In this elementary definition of the term, theory also refers to ***general principles or abstract ideas*** that may not necessarily be true in actual fact. For example, when we say, "In theory, democracy is government by the people," we are referring to some general principle or idea of democracy; we are not explaining how democracy actually works in practice.

2. More restrictively, theory can mean ***normative theory:*** that is, value-centered political philosophy (or political thought), as we defined these terms earlier in this chapter.
3. In the natural and social sciences, theory most frequently means ***a generalization, or set of generalizations, that seeks to*** **explain,** ***and perhaps*** **predict,** ***relationships among variables. This is*** **explanatory theory.**

Explanation is the main aim of theory in empirical political science. The word *because* is stated or implied in just about every explanatory theory.

Parsimonious and Middle-Range Theories Scientists use the term *parsimonious theory* to refer to a *theory that explains a vast range of phenomena in very succinct terms.* Charles Darwin's theory of evolution is an example of parsimonious theory. His theory states that all animal life evolved from lower animal forms through a process of natural selection. In just one brief sentence, Darwin's theory purports to account for all animal species. Parsimonious theories are said to have a high level of *explanatory power*.

Political science has few parsimonious theories. (Some political scientists maintain that it has none.) Instead of enunciating bold generalizations capable of explaining all or even most political phenomena in a sentence or two, political science largely confines itself to so-called *middle-range theories*. These are theories that explain specific categories, or segments, of political reality. Typically, middle-range theories in political science are sets of statements and hypotheses that are strung together to explain a particular subfield of political reality.

Democratic theory consists of descriptions of how democracies are supposed to work in principle and how they work in practice, along with various explanations of how democracies emerge or endure.

Elite theory describes the roles that political elites play and makes a variety of explanatory generalizations about their social backgrounds, their political perceptions, their relationships with the masses, and so on.

Rational choice theory explains political behavior by regarding virtually all individuals as "rational actors" who seek to increase their personal gains and minimize their losses or risks. As in Prisoner's Dilemma, rational choice theories present the logic of a process or behavior in general (conflict, for example), without immediate reference to specific cases. But the logic can be used to explain specific cases (like the Palestinian–Israeli conflict). Some proponents of rational choice theory assert that it is a parsimonious theory that can explain a vast array of political phenomena. Others, however, insist that it is just another middle-range theory that has its limits.

Middle-range theories also exist on a host of other political phenomena, such as *electoral behavior, the state, revolution, and war*. Subsequent chapters in this book examine a number of these theories.

As a general rule, explanations that merit the term theory have usually gained wide acceptance over long periods of time because their ability to explain the facts has been confirmed in repeated scientific investigations. Theories thus tend to be more solidly grounded in empirical reality than hypotheses, which are typically assumptions that have yet to be sufficiently tested. Nevertheless, even the most widely respected theories are not unchallengeable truths. They are meant to be constantly challenged against the hard facts of reality. In political science as in the natural sciences, *explanatory theories are not abstractions that are divorced from reality; on the contrary, they seek to* explain *reality.* Theories are valid only as long as they are consistent with the facts they endeavor to explain. If new evidence comes to light that contradicts the theory,

then the theory is probably either partially or entirely wrong. It must then be modified or discarded and replaced by a better theory that fits the facts. All explanatory theories need to be repeatedly subjected to verification against the hard data of reality. The main way of accomplishing this task is by breaking theories down into hypotheses and testing them against the available evidence.

Hypotheses

A* hypothesis *is an assumption or supposition that needs to be tested against relevant evidence.

In some cases, hypotheses can be purely *descriptive* in nature. For example, we can hypothesize that democracy has broad popular support in Russia. We can then test this hypothesis by surveying a large number of Russians and asking them whether they support democracy, and if so, how strongly. After we've collected and analyzed our research data we will end up with a description, a picture, of mass attitudes toward Russian democracy. The data will permit us to describe the Russian electorate as mostly supportive of democracy or mostly unsupportive of it by providing statistical readings of the proportion of the voters who support it strongly, the percentage of those who support it with less conviction, and the percentage of those who don't support it very much or not at all.

This descriptive hypothesis simply proposes certain facts about the Russian electorate, and the hypothesis-testing survey seeks to determine whether and to what extent those facts are really occurring. The descriptive hypothesis does not suggest an *explanation* as to *why* the proposed phenomena might be occurring, however. It is not an *explanatory* hypothesis that explains *why* Russians feel as they do about democracy. But in political science as in the physical sciences, *explanation is the ultimate goal*.

Explanatory hypotheses posit a cause-and-effect relationship between dependent and independent variables that can be tested empirically (i.e., against factual evidence). By formulating explanatory hypotheses about politics, we force ourselves to specify our dependent and independent variables and to be clear about the sharp difference between cause and effect. By *testing* hypotheses empirically, we submit them to a reality check: we take a close look at all the available facts to see if they substantiate or contradict the relationships we propose in our hypotheses. For example, we might find that, contrary to our hypothesis, popular support for democracy in Russia is in fact much weaker than we had originally surmised. We must then formulate explanatory hypotheses that might suggest possible reasons for this phenomenon. We could hypothesize that public dissatisfaction with the economy is causing people to turn against democracy; or we could hypothesize that disgust at political corruption may be the main explanatory variable accounting for Russian attitudes; or we could assume that public ignorance about democracy may be the explanation; or we could develop a host of other possible explanations, whether singly or in combination.

We could then test these various explanatory hypotheses by going back to Russia and resurveying the electorate, asking them more specific questions about their attitudes on the economy, corruption, and so forth. After analyzing our survey data, we can then come to some conclusions about which of these explanatory variables explain why many Russians are suspicious of democracy. We may find, for example, that *all* of them play a role, albeit to varying degrees, among the voters. In these explanatory hypotheses, *"negative attitudes toward democracy"* is the *dependent variable.* The *possible explanations* to be tested are the *independent variables.* (See figure 3.8.)

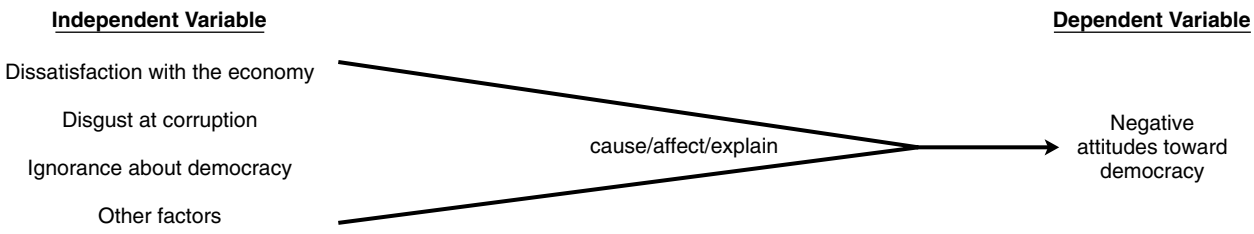

FIGURE 3.8 Independent Variables Affecting Negative Attitudes Toward Democracy

The second part of this chapter is devoted to an extended exercise in testing the proposition that *"national wealth promotes democracy."* Is this hypothesis correct? Is it only partially correct? Or is it perhaps just plain wrong? Reading Part Two attentively will give you a more comprehensive idea of how the logic of hypothesis testing applies to the study of politics.

Scientific Generalization and Practical Politics

Explanatory theories and hypotheses in political science greatly enhance our understanding of the real world of politics. They can also help us work out our own positions on the political problems of our times. Indeed, many of the practical policy choices facing government decision makers and average citizens are rooted in some overarching theory. Debates over the decision to invade Iraq in 2003 are connected with theories about U.S. foreign policy, with some favoring "regime change" to create a democracy as an immediate goal and others placing national security ahead of democratization as the country's number-one foreign policy priority, even when it means putting up with a vile dictator. Debates on tax policy are connected with theories about how or whether governments can stimulate economic growth while cutting budget deficits and keeping inflation low. The list of theory-related policy issues could be extended indefinitely.

Although some people dismiss theory as completely detached from the real world, in fact most individuals act in political life on the basis of certain assumptions and understandings about politics that are the equivalent of theoretical generalizations, even if they do not always realize it. As the British economist John Maynard Keynes once observed, "Practical men, who believe themselves to be exempt from any intellectual influences, are usually the slaves of some defunct economist." By the same token, politicians and the people they govern can be the slaves of political ideas they accept uncritically. An intelligent approach to politics requires a keen understanding of the relevance of explanatory theory and hypothesis testing to the real world of political action. To put it succinctly, the scientific approach to politics requires us to support our political generalizations with relevant evidence and systematic logic.

Models

In political science, a model is a simplified representation of reality in descriptive or abstract form.

A scale model of a Stealth bomber can neither fly nor drop bombs. Its sleek proportions, however, provide some understanding of how the real aircraft is able to avoid radar detection. An auto designer's computer model of next year's dream car indicates how all its components will mesh together in perfect harmony once the vehicle hits the road. Environmental scientists have built a large model of the Chesapeake Bay designed to replicate the bay's complex ecological system. Economists construct graphical and mathematical models of various dynamic economic processes, such as a perfectly competitive market economy or a global free trade system.

Though the composition of these models is different, they all serve the same function: they enable us to understand some aspect of reality, whether aerodynamics or the economy, by *representing* some of its essential features in a simplified or idealized form. Obviously, these scaled-down physical or mathematical models cannot be perfect copies of the realities they represent. The car designer does not plan for the car to malfunction, but at some point it probably will. Economists know that purely free market systems, which are devoid of any governmental interference or monopolies, exist nowhere in today's world.

The purpose of a model is not to represent reality perfectly but to enable us to understand reality by allowing us to compare it against some standard or pattern. If the car has stalling problems, the computer design can help us find the source. If world trade is declining, the mathematical model of how a free trade system works in theory may help us understand how to deal with existing trade barriers in the global economy. When viewed against the model, the complexities of the real world stand out all the more prominently by comparison with the simplified version. As one economist put it, "Models are to be used, not believed." As learning devices, models serve a *heuristic* purpose, a term that derives from the Greek word meaning "to find out."

In roughly similar fashion, political scientists use models of various kinds to help us understand political realities. Sometimes these models are

purely descriptive. For example, we can construct a model of democracy just by listing its characteristic features: a competitive electoral system, legal guarantees of certain freedoms and rights, and so forth. Although many democracies in today's world may actually diverge from this model of an "ideal" democracy in one way or another, these divergences will tend to stand out when compared with the model, prompting us to investigate how and why they occur.

A descriptive model of this sort is known as an *ideal type.* An **ideal type** ***is a model of a political or social phenomenon that describes its main characteristic features.*** The term was coined by the German sociologist *Max Weber* (1864–1920), one of the founders of modern sociology. Weber was among the first students of modern bureaucracy. Based on his observations of European bureaucracies in the early twentieth century, Weber devised an ideal type of a modern bureaucracy that specified the features most commonly found in them. He described this standard (or ideal-typical) bureaucracy as a highly impersonal organization run in accordance with strict rules and legal procedures. Not all bureaucracies in Europe conformed exactly to this standard type in every respect, however. For Weber, an ideal type is not just a carbon copy of one or two real-world examples of the phenomenon it represents. Rather, it is an abstract conception constructed from a variety of observations and trends. Weber used it as a conceptual standard against which social scientists could study and compare the world's bureaucracies and come to a better understanding of the phenomenon of bureaucracy itself. The concept of the ideal type is very useful in describing all sorts of political phenomena.

In addition to ideal types, political science makes use of several other types of models. *Static models* simply define the fundamental attributes of a phenomenon (like ideal types), but they do not describe how those attributes change or develop over time. By contrast, *dynamic models* describe processes of change. For example, the *modernization model* describes how so-called "traditional societies" develop into "modern societies" through the process of industrialization. As a nation's economy becomes more industrialized, people tend to move from the countryside into the cities, communications networks expand, educational opportunities improve, and traditional religious practices and superstitions give way to more secularized lifestyles and beliefs. Modernization theorists base this model on the historical development of Europe and the United States, and they believe that most countries of the world sooner or later will move in much the same directions. The modernization model of political development has provoked considerable controversy. Its critics contend that it is too narrowly based on European and American experiences and that it pays inadequate attention to the special experiences and cultures of Asia, Africa, the Middle East, and other regions of the developing world. Some of these critics propose alternative models of political development that combine elements of both modern and traditional societies. We shall return to this issue in chapters 12 and 15.

Some models are *analogies.* In these cases, political scientists clarify political phenomena by comparing them to something else. For example, one scholar likens democracy to a market economy, with voters choosing candidates in the political "marketplace" on the basis of considerations very similar to those motivating consumers shopping for a good buy.[6] Another political scientist compares the ways governments work to cybernetic processes, complete with feedback mechanisms, communications loops, and other features of computer technology.[7] As we saw in chapter 2, some analysts regard many forms of political behavior as analogous to games like Prisoner's Dilemma.

Some models are simply *diagrams*, or schematic depictions of processes and relationships. Figures 3.9 and 3.10 diagram two alternative forms of democracy: *direct democracy* and *representative democracy.* Under direct democracy, the citizens themselves assemble and make authoritative decisions for their community. Under representative democracy, as the term implies, the citizens elect their representatives to the legislative and executive branches of government and entrust the elected

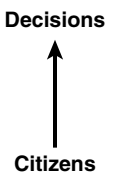

FIGURE 3.9 Model of Direct Democracy

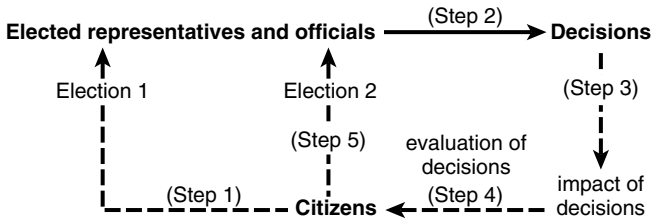

FIGURE 3.10 Model of Representative Democracy

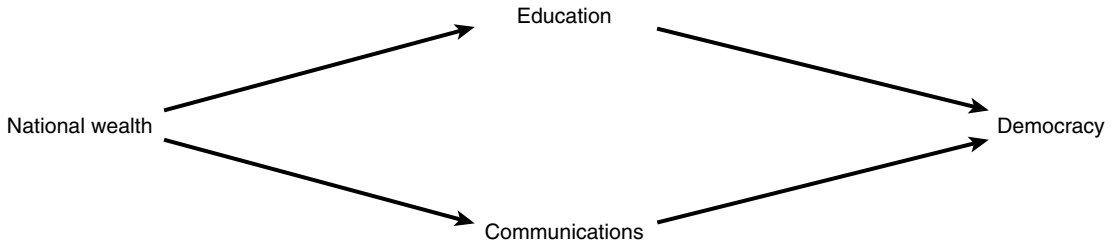

FIGURE 3.11 Model Depicting Causes of Democracy

officials and their appointees to make governmental decisions on their behalf. Once some of these decisions take effect, the citizens have the opportunity to evaluate their impact and to hold their elected representatives accountable in the next elections by voting them out of office or reelecting them.

Finally, like economists and natural scientists, political scientists sometimes construct complex mathematical models in an effort to represent various political phenomena as precisely as possible. This book will not examine such statistically advanced modeling techniques.

Strictly speaking, a model is not an explanatory theory. Whereas explanatory theory *explains* reality, models *represent* and *describe* reality. However simplified or sophisticated its form may be, a model is just a picture, not an explanation. Very frequently, however, we use the term *theoretical model* (or *conceptual model*). This term can have two meanings.

In one meaning, a model is said to be theoretical if it is an intellectual abstraction as opposed to a physical representation of something. Computer models, mathematical models, diagrams, and even ideal types are theoretical models in this sense of the term. They are *intellectual* or *abstract* representations of reality, not physical objects.

In the second meaning of the term, a theoretical model *represents* explanatory theories. A theory that states, for example, that national wealth *causes* democracies to come about by promoting education and communication can be depicted in a diagram. Figure 3.11 is a *causal model* that graphically represents this theory. Causal models can be a useful way of specifying causal relationships and clarifying our thinking about how different variables interact.

Moreover, models can stimulate explanatory theory. Just as environmental scientists use their model of the Chesapeake Bay to develop theories about how marine life develops or why so much of it is dying prematurely, political scientists can use their models to come up with explanatory theories about how and why various political phenomena occur as they do. Models, in short, are yet another useful method for generalizing systematically about politics.

Paradigms The term *paradigm* has two meanings in political science:

> **In one sense, *a* paradigm *is a prime example of a particular phenomenon or pattern.***

For example, the British system of government is a *paradigm* of parliamentary democracy. This is not to say that all parliamentary governments are exactly like Britain's in every respect. Italy, Israel, and other parliamentary political systems differ from the British version (and from one another) in various ways. Still, they are all close to the British example in certain fundamental respects. We can understand how these various governments work more clearly by comparing them to the British paradigm.

Paradigms are quite useful in comparative politics because they help us observe and analyze variations on a theme (such as parliamentary democracy). In this respect they serve the same purpose as models. The difference is that whereas models tend to be abstract or intellectually idealized representations of reality, paradigms are usually real-world phenomena (like Britain's governmental system).

In another sense, *a* paradigm *is a particular way of looking at phenomena, formulating questions and generalizations, and conducting research.*

This second definition of paradigm construes it as a particular form of intellectual inquiry or a specific approach to scientific investigation. This meaning of the term was popularized by Thomas Kuhn, a philosopher interested in the nature of scientific thought. Kuhn argued that over the centuries Western science developed several radically different paradigms of scientific thinking, based on very different assumptions about the natural world and about how to study it. Ptolemaic astronomy, for example, held that the sun and planets revolve around the Earth. Only in the sixteenth century did Ptolemy's ancient paradigm give way to the heliocentric astronomy of Copernicus, based on more precise methods of observing the solar system. Similarly, Aristotle's views on physics were eventually supplanted by Newton's laws of mechanics; Newton's paradigm gave way to twentieth-century relativity theory and quantum mechanics; and so on.[8]

This meaning of paradigm also applies to political science. The paradigm of political science presented in this chapter conforms in its essential features to the rules of scientific logic that emerged from the empirical approach to scientific inquiry pioneered by Copernicus, Newton, and other seminal contributors to modern science. This scientific approach to studying politics is a fairly recent development, however. It emerged slowly in the United States in the 1930s and 1940s and increasingly shaped the way American political scientists were trained to think about politics in the 1950s and subsequently. Earlier, the dominant paradigm of political science research was largely descriptive and tended to concentrate on governmental institutions and constitutional law. It was less concerned with studying how people behave in political life, and it did not employ such concepts as variables, hypotheses, correlations, and other nuts and bolts of modern scientific thinking. It was also considerably less quantitative. Even today, many important books and articles are written about politics that employ the more traditional descriptive approach. But the scientific paradigm presented in this book is currently the leading one in most American universities.

QUANTITATIVE AND QUALITATIVE POLITICAL SCIENCE

Political science offers two basic approaches to investigating relationships among variables: *quantitative* approaches and *qualitative* approaches.

Quantitative political science is "by the numbers." It looks mainly at phenomena that can vary in measurable degrees or quantities, such as the number of votes cast in an election or in legislative balloting, or the percentages of people who express various opinions in a public opinion survey. Statisticians have developed a variety of sophisticated techniques and software programs for performing different types of measurements involving quantifiable dependent and independent variables, and many of these tools can be adapted to research on politics.[9]

We will not use any of these sophisticated statistical techniques in this book, but they can be quite useful in the study of political science at more advanced levels, depending on the nature of the problem being investigated.

Statistical rigor is not always possible in the study of politics, however. Sometimes we would like to have relevant statistical information but it is not available, or if available, it is unreliable. Authoritarian regimes, for example, rarely permit

contested elections or release public opinion poll information, and the statistics they do publish (such as economic data) may be untrustworthy. At least in these cases, Mark Twain was right when he quipped, "There are lies, damned lies, and statistics." At other times we may have statistical information available that can be quite useful in helping us understand a situation, but all we need do is report this information in tables or graphs without getting into highly sophisticated calculations. Economic statistics, election returns, and other relevant quantitative data are often used in this uncomplicated but vitally important way in political science, and we shall employ such raw data quite extensively in subsequent chapters. Finally, in some cases statistical analysis is only partially helpful in enabling us to understand political reality and must be combined with other factual information that is not readily quantifiable, such as historical accounts or other descriptions of political events, processes, or ideas.

Research and analysis in political science that is not primarily quantitative in nature is called *qualitative* political science. Political scientists who are engaged in qualitative research rely largely on descriptive accounts of the political realities they study. In seeking to explain political processes and interactions, analysts frequently use qualitative research to provide detailed (or "thick") descriptions of such things as how governmental institutions work, or how parties and interest groups are organized, or how political ideas and ideologies define the issues facing the country. These and similar political phenomena cannot be fully understood if we confine ourselves strictly to statistical analysis; descriptive detail may also be necessary.

Many qualitatively oriented analysts are especially sensitive to the broader historical and contemporary contexts within which political life takes place in any given country. Qualitative analysts often remind us that the specific details of politics—such as a recent leadership change or the latest elections—do not occur in a vacuum. These events have historical roots, and they may also be related to complex social, cultural, economic, or other conditions in ways that cannot be adequately explained just by referring to numerical data or by performing statistical operations. Statistics, such analysts would argue, can't explain everything. We need to immerse ourselves in the history, culture, and languages of individual countries if we want to understand their political systems.

Advocates of quantitative and qualitative approaches to political science have engaged in sharp debates about which mode of analysis is superior. Quantitatively oriented analysts cherish the precision and neatness of statistical rigor; they often accuse qualitatively oriented researchers of being vague or mushy. Qualitatively inclined political scientists, for their part, tend to accuse their number-crunching colleagues of ignoring everything about politics that cannot be reduced to mere statistics. They contend that quantifiers fail to appreciate the full scope of political reality in all its complexity.

A substantial number of political scientists today would admit that quantitative and qualitative approaches are complementary and that the approach an analyst chooses depends on the nature of the problem being studied. Most important, both quantitative and qualitative approaches must observe the same ground rules of scientific logic that we cover in this chapter.[10]

LOGICAL FALLACIES

To round out this chapter's introduction to critical thinking about politics, we must warn against certain logical fallacies that are commonly committed in political argumentation. Our list can be only a partial one, and it cannot substitute for a book on logic. Nevertheless, the fallacies presented here are common enough to warrant special attention.

Fallacy of composition ***This fallacy assumes that the whole is exactly the same as its parts.*** Beware of ascribing attributes (such as attitudes, behaviors, etc.) to an entire class or group when those attributes may apply only to a portion of that group. For example, do not say, "The Germans are highly disciplined" or "Americans are well off," when in fact only *some* Germans may be highly disciplined and *not all* Americans are well off. This fallacy is the basis of *stereotyping*, that is, regarding all individuals of a particular group as similar while overlooking their differences.

Tautology (circular reasoning) ***ascribes causation to the very phenomenon whose causes we are trying to explain.*** To put it another way, beware of using your dependent variable as an independent variable that accounts for it. The term comes from the ancient Greek word for "the same." For example, the statement "Armed conflict among Yugoslavia's contending groups produced a bitter civil war" is tautological because civil war *is* armed conflict among a country's contending groups. The two points are essentially the same thing; hence, the one cannot cause the other. To ascertain the causes of the civil war, we must look at real explanatory variables such as ethnic and religious hatreds. One of the most famous tautologies attributed to a politician was the remark allegedly uttered by President Calvin Coolidge, "When a great many people are unable to find work, unemployment results."

Post hoc ergo propter hoc ("After it, therefore because of it") is the fallacy of concluding that A *caused* B just because A *preceded* B. For example, "The U.S.-led victory over Iraq in the Persian Gulf War at the start of 1991 precipitated the collapse of the Soviet Union later that same year." In fact, the war had no demonstrable effect on the Soviet collapse.

The inevitability fallacy. Just because things turn out a certain way, beware of assuming that they necessarily *had to* turn out as they did. As a rule, political outcomes are *path dependent*: they follow from the paths charted by history. But the course of events is often contingent on numerous factors—decisions, interactions, fortuitous occurrences, and the like—that are capable of leading to multiple possible results. Many things that appear inevitable after they happen were unforeseeable before they happened.

A fortiori ("All the more") assumes that what is true of a phenomenon at one level or degree is automatically true of the same phenomenon at larger levels or degrees. The statement "The more private enterprise there is in the economy, the more democracy will flourish" assumes that, just because a certain amount of private enterprise may be good for democracy, then a totally private economy, with no government involvement in economic affairs whatsoever, will be even better for democracy. It overlooks the possibility that a completely private economy, with no government-sponsored safety net to help the poor and the middle class, could create great disparities in wealth and perhaps lead to intense social conflicts capable of destroying democracy.

False analogy is the fallacy of making inappropriate or inexact analogies or comparisons between one phenomenon or situation and another. One example is the statement "Political systems are like organisms: they are born, they grow, and they inevitably decay and die." This "organic" analogy does not stand up to the facts. Historical analogies are also frequently misused. For example, prior to the successful U.S.-led attack against Iraqi troops occupying Kuwait in 1991, some people warned that such an invasion would result in a protracted military standoff similar to the Vietnam War. The analogy proved incorrect: the Persian Gulf War lasted only a few weeks. In fact, no two historical cases are ever *exactly* alike in all respects, and one must pay as much attention to dissimilarities as to similarities when comparing them.[11]

A *nonfalsifiable hypothesis* is a hypothesis that cannot be tested empirically. The only kind of hypothesis that can be tested empirically is one that is capable of being *contradicted* by factual evidence. An example of a nonfalsifiable hypothesis is, "Our country's fate is in God's hands." Because we cannot physically see or hear God, we have no empirical evidence enabling us to *disprove* the hypothesis; everything that happens to our country, good or bad, can be interpreted as consistent with it. Another example: "The laws of history make the collapse of authoritarianism inevitable in the long run, though it may succeed in the short run." Because we cannot have empirical evidence on the future, we have no basis for proving that the hypothesis is wrong (or right). Both hypotheses are articles of faith and cannot be empirically tested against hard evidence.

False inference is the fallacy of making unwarranted inferences from statistical data or other facts, especially when trying to establish causation. *Reductivism* is the fallacy of explaining something in terms of one sole cause when other causes could also be at work. Both fallacies are covered in the second part of this chapter.

II. THE LOGIC OF HYPOTHESIS TESTING

Hypothesis testing is a central activity of political science. It is one of the things that makes it a science in the formal meaning of the word. By learning how to formulate and test hypotheses we can learn a lot about both political science and, not incidentally, political reality itself.

By learning some of the main rules of hypothesis testing, we can also learn a great deal about how to think logically and coherently. One of our most important tasks in this regard is to learn some of the cardinal *rules of causation*. Just what do we really know about politics for sure, and what are we less sure about? To what extent can we really "prove" that one thing actually causes another? How valid are our generalizations? Questions like these lie at the heart of *epistemology*, the field of inquiry that seeks to clarify the scope and limits of our ability to know. Epistemological issues are of fundamental importance in all the sciences, including political science, and they are vital to the development of critical reasoning skills more generally.

SOURCES OF HYPOTHESES

Hypotheses about politics can spring from a variety of sources. In some instances they may derive from questions that pop into our minds from our observations of reality. Just from reading the newspaper, for example, we may notice the rather obvious fact that some countries have democratic systems of government and others do not. How come? From a superficial survey of these news accounts, a few possible answers may come to mind. One possible explanation centers on economics: the world's most successful and enduring democracies, we observe, are among the richest countries of the world. We notice, in particular, that such well-to-do countries as the United States, Canada, Britain, France, Germany, and Japan are successful democracies. Countries that lack democracy and countries that are currently engaged in the process of building democracy following the collapse of an authoritarian regime appear for the most part to be less economically developed. Many countries in Latin America and Africa fall into these latter categories.

A cursory glance at these facts prompts us to formulate the following hypothesis: *"National wealth promotes democracy."* This hypothesis implies a cause-and-effect relationship: national wealth somehow *causes* democracy to come about and endure, whereas national poverty precludes or undermines democracy.

The technique we have just used to formulate our hypothesis is called *induction.* **Induction *is a reasoning process that goes from the specific to the general.*** We begin with some *specific facts or observations*, and on the basis of these specifics we devise an overarching *generalization* that applies to the phenomena we have observed as well as to related phenomena that we have not as yet observed, as depicted in figure 3.12. (*Induction* derives from the Latin word for "lead into"; in essence, specific facts lead into a generalization.) Thus our observation of a few specific wealthy democracies and a few specific poor nondemocracies leads us to suspect that national wealth is perhaps associated with *all* democracies and national poverty is perhaps associated with *all* nondemocracies. We say "perhaps" because at this point these broad generalizations are only suspicions or guesses that we have made on the basis of a small number of observations. That is precisely what hypotheses frequently are: suspicions, educated guesses, or hunches. We don't know yet if our hunch is true or false in reality. Only when

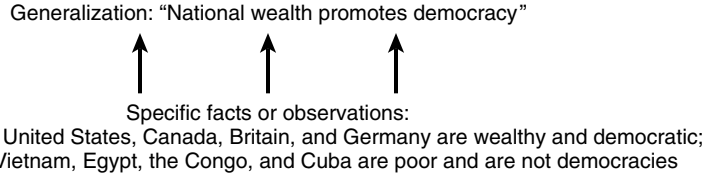

FIGURE 3.12 Diagram of Inductive Reasoning

we have tested our hypothesis by looking at a far wider number of democracies and nondemocracies will we have a better idea of whether, or to what extent, our proposed generalization is valid.

Another source of hypotheses consists of generalizations that have already been formulated. In the course of our newspaper gleanings we may have come across an editorial arguing in favor of major international efforts to promote the economic development of nascent democracies like Russia and South Africa. The editorialist justifies this policy recommendation on the basis of a broad generalization: *"National wealth,"* she writes, *"promotes democracy."*

The editorialist then sets forth a number of reasons explaining why national wealth promotes democracy. One reason is that democracy requires an educated populace that understands political issues and actively participates in the electoral process and other opportunities for political involvement. Educated people, she argues, are more likely than the uneducated to take part in political affairs. But an educated electorate requires a good mass education system, and that costs money. Wealthy countries are in a better position than poor ones to provide their citizens with a good education. Democracy, we are told, also requires a well-developed mass communications system so that people can keep themselves informed about political developments. That too costs money.

Furthermore, the writer maintains, democracy requires a fairly sizable middle class that is eager to have a say in the way the country is governed. The middle class, she believes, is a prime source of pro-democracy activism. By contrast, the rich may be perfectly content with an authoritarian regime that allows them to retain their wealth, while the poor may be insufficiently educated or too unorganized to push for democratic reforms. Wealthy countries are more likely than impoverished ones to have a sizable middle class.

In addition, the writer notes, wealthy countries are better equipped than poor ones to meet their citizens' demands for government services. Democracy gives the mass public an opportunity to demand such benefits as education, decent housing, health care, job training, and pensions. Poor countries are less able to meet these popular demands, and their rulers therefore deny their populations a chance to articulate them in an open democratic process. A repressive authoritarian government is the likely result. Thus, if we want democracy to succeed around the world, the writer concludes, the wealthy democracies must do whatever they can to assist the less developed nations of the world in overcoming their poverty.

In this particular case, the editorialist did not look at specific democratic and nondemocratic countries, as we did in our perusal of newspaper articles. Rather, she derived her hypothesis from *generalizations* about what causes democracies to come about. Her supposition that national wealth promotes democracy is based on a general explanation of various factors needed to build a democratic regime, all of which ultimately depend on national wealth. Thus *generalizations themselves*, not just specific facts, can also be a source of hypotheses.

STEPS OF HYPOTHESIS TESTING

Are the editorialist's sweeping generalizations correct? In order to find out, we need to break them down into testable propositions and test them against hard evidence. Let's concentrate on her central hypothesis, "National wealth promotes democracy." How do we go about testing this proposition?

We can choose from a variety of methods, depending on whether we are relying mainly on quantitative or qualitative analysis (or some combination of the two) and on whether we want to examine a large number of countries or confine ourselves to a few particularly illustrative ones. In most cases, however, the logic of hypothesis testing will involve the following five steps:

1. Defining key terms
2. Identifying the variables
3. Specifying the expectations of the hypothesis
4. Collecting and examining the evidence
5. Drawing conclusions from the evidence

Defining Key Terms

Because our hypothesis is about democracy, we must define the term. *Democracy* is a multifaceted concept that includes regular elections, civil liberties, and a host of other elements. The Freedom

House lists of political and civil rights that we presented in chapter 2 encompass just about all of democracy's essential components. Moreover, the numerical rating system that Freedom House employs, with the most democratic countries meriting a grade of 1 and the most authoritarian states getting a 7, provides a useful estimate of the extent to which the countries of the world fulfill these numerous criteria, despite the system's lack of statistical precision. We shall therefore use the Freedom House criteria here as our operative definition of democracy, and we'll use the Freedom House composite political and civil rights index as a measure of each country's relative degree of democracy. In addition, we'll sort the countries of the world into the categories we introduced in chapter 2. Accordingly, *democracies* are countries with a political/civil rights index from 1 to 2.5; *semi-democracies*, 3 or 3.5; *semi-authoritarian regimes*, from 4 to 5.5; and *authoritarian regimes*, from 6 to 7.[12]

We can narrow our conception of democracy even further by singling out *successful* democracies, the ones that endure over fairly lengthy periods of time. For the purposes of this exercise, we'll define a *long-term democracy* as one that has existed for at least forty years in succession.

Because we are looking for a relationship between democracy and national wealth, we must also specify what we mean by *wealth* and *poverty.* There are several different ways of measuring a country's annual income, but we need not go into those details here. We'll simply rely on the gross national income (GNI) statistics reported by the World Bank in *World Development Report 2007.* That publication divides the world's countries into four categories by their per capita GNI in 2005: *high-income* countries, $10,726 or more; *upper-middle-income* countries, $3,466 to $10,725; *lower-middle-income* countries, $876 to $3,465; and *low-income* countries, $875 or less.[13]

Finally, what do we mean when we hypothesize that national wealth *"promotes"* democracy? Here we need to specify that national wealth somehow "causes" democracy. More specifically, we mean that (a) wealth *causes* democracy to come into existence, replacing authoritarian modes of government, and (b) it *causes* democracies already in existence to succeed over protracted periods of time.

Identifying Our Variables

The next step we must take is to identify our dependent and independent variables. Because the *existence of democracy* is the effect we wish to explain, it is our *dependent variable*.

Our *independent variable* is the *level of national wealth.* We want to see how varying levels of national wealth, as specified in the per capita GNI categories listed earlier, relate to democratic and nondemocratic systems of government. This independent variable is our presumed *explanatory* variable. We can *manipulate* it by observing how different gradations of national wealth are related to democracy.

Specifying the Expectations of the Hypothesis

Hypotheses are usually stated as declarative propositions. Thus far we have stated our hypothesis as a declarative sentence: *"National wealth promotes democracy."* To test a hypothesis systematically, we must restate it in terms that will indicate what we should look for as we hunt for evidence that might confirm or contradict its validity: *if* the hypothesis is valid, *then* what would we *expect* to find as we sift through the available facts? In other words, what *expectations* does the hypothesis generate? To guide our research, therefore, *it is helpful to restate our hypothesis in "if . . . then" form:*

> *If* national wealth promotes democracy, *then* we would expect to find that (a) relatively wealthy states are democracies and (b) relatively poor states are not.

Logically, we would also expect to find that (c) democracies will be relatively wealthy, and (d) authoritarian regimes will be relatively poor. The more wealth a country has, the greater is the likelihood that it will be democratic; a country with poor economic fortunes has a poor prospect for democracy and a greater likelihood for some degree of authoritarianism. We would therefore expect to find that high-income and upper-middle-income countries will be either democracies or semi-democracies, and that lower-middle-income and low-income countries will have either semi-authoritarian or authoritarian regimes.

The process of translating our hypothesis into "if . . . then" form is an example of *deduction*. **Deduction** ***is a reasoning process that proceeds***

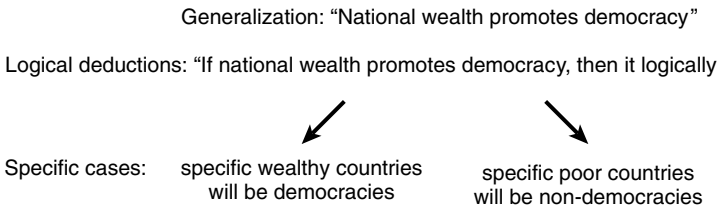

FIGURE 3.13 Diagram of Deductive Reasoning

from the general to the specific. It begins with a generalization that covers a wide range or class of phenomena and then applies that generalization to specific cases (see figure 3.13). In our example, we start with our hypothesis, which proposes that national wealth promotes democracy *in general*, and we apply that generalization to specific countries. In deductive logic, the applications of the generalization to specific cases *must follow with logical necessity.* In other words, *if* A is true, *then* B *must* be true; if B is true, it follows that C is true; and so on. ("Deduction" comes from the Latin term for "lead from": each conclusion leads from the preceding one with logical necessity.) As we've already suggested, *if* national wealth promotes democracy, *then* it is only logical that specific countries that are relatively wealthy should be democracies, while specific countries that are relatively poor should be nondemocracies. When phrased in "if . . . then" terms, a hypothesis *predicts* a certain research result as a logical outcome.

The deductions we have just drawn from our hypothesis tell us what we should *expect* to find in reality. But whether we actually *will* find these results is another matter. If the facts that we gather in our hypothesis-testing research are consistent with these predicted results, then the hypothesis itself may be factually correct. But if the facts deviate from the expected results, the hypothesis may be wrong. We must now look at the facts to see if the predicted outcomes occur.

Collecting and Examining the Evidence

Empirical analysis, as we've already pointed out, is based on facts. Unless there is a sufficient body of factual evidence bearing on our hypothesis, we cannot properly test it. Suppose, for example, that there is only one democracy in the world, and it happens to be quite rich. All the other governments of the world are nondemocracies, and all are economically undeveloped. On the basis of this evidence, we can conclude that the available evidence is *consistent* with our hypothesis linking democracy with a relatively high level of national wealth. But one case is scarcely enough to warrant high confidence in the generality of this conclusion. It does not convince us that national wealth is really necessary to *promote* democracies elsewhere. Other factors may be more important (such as the degree of social harmony, the nature of religious beliefs, and so on). The fact that our lone democracy is wealthy may be purely coincidental and have nothing whatsoever to do with causing or promoting democracy. Our confidence in the validity of a generalization tends to rise with the number of cases we have in its support.

As it happens, quite a few democracies in the world meet our definition of the term. We must now identify them and see if they meet our criteria of national wealth. The countries listed in table 3.1 meet these criteria: they are among the richest countries of the world, and all are bona fide democracies with combined political and civil rights ratings of 1 to 2.5. All but a few are also long-term democracies that have sustained democratic institutions for at least forty years. (There were no high-income semi-democracies.)

There is also a large number of upper-middle-income countries that can be classified as either democracies or semi-democracies, once again in conformity with our expectations (table 3.2 on page 85). Unlike the majority of high-income countries, however, only two of these countries—Costa Rica and Botswana—qualify as long-term democracies that have maintained democratic institutions and practices for at least forty years without interruption.

TABLE 3.1

High-Income Democracies

(2005 Political/Civil Rights Index of 1 to 2.5; Per Capita GNI of $10,726 and Above)

Country	Per Capita GNI	Political/Civil Rights Index	Long-Term Democracy (X)
Luxembourg	$65,630	1	X
Norway	59,590	1	X
Switzerland	54,930	1	X
Denmark	47,390	1	X
Iceland	46,320	1	X
United States	43,740	1	X
Sweden	41,060	1	X
Ireland	40,150	1	X
Japan	38,980	1	X
United Kingdom	37,600	1	X
Finland	37,460	1	X
Austria	36,980	1	X
Netherlands	36,620	1	X
Belgium	35,700	1	X
France	34,810	1	X
Germany	34,580	1	X
Canada	32,600	1	X
Australia	32,220	1	X
Italy	30,010	1	X
New Zealand	25,960	1	X
Spain	25,360	1	
Greece	19,670	1.5	
Israel	18,620	1.5	X
Slovenia	17,350	1	
Portugal	16,170	1	
South Korea	15,830	1.5	
Malta	13,590	1	X
Antigua and Barbuda	10,920	2	X
Andorra	Estimated high income	1	
Bahamas	Estimated high income	1	X
Barbados	Estimated high income	1	X
Cyprus	Estimated high income	1	
Liechtenstein	Estimated high income	1	
Monaco	Estimated high income	1.5	
San Marino	Estimated high income	1	X
Taiwan	Estimated high income	1	

Although there seems to be abundant evidence confirming our expectation that wealthy and upper-middle-income countries tend to be democracies, or semi-democracies, there is also evidence in support of our assumption that, conversely, poor countries tend to be semi-authoritarian or authoritarian regimes. Take a look at table 3.3 on page 86.

Our expectation that lower-middle-income countries will tend to be either semi-authoritarian or authoritarian regimes also has evidence in its support, as table 3.4 on page 87 demonstrates.

These data support the expectations of our hypothesis that the poorer a country is, the less democratic it is likely to be.

We have now found quite a few contemporary democracies and semi-democracies classified as wealthy or relatively wealthy (the latter having upper-middle-level incomes) and a large number of nondemocracies classified as poor or relatively poor (the latter having lower-middle-level incomes). Countries with the highest score on the political/civil rights index are predominantly in the wealthy category, as are all the long-term

TABLE 3.2

Upper-Middle-Income Democracies and Semi-Democracies

(2005 Political/Civil Rights Index of 1 to 2.5 for Democracies, 3 to 3.5 for Semi-Democracies; 2005 Per Capita GNI of $3,466 to $10,725)

Democracies			Semi-Democracies		
Country	**Per Capita GNI**	**Political/Civil Rights Index**	**Country**	**Per Capita GNI**	**Political/Civil Rights Index**
Czech Republic	$10,710	1	Seychelles	$8,290	3
Trinidad and Tobago	10,440	2.5	Turkey	4,710	3
Hungary	10,030	1			
Estonia	9,100	1			
St. Kitts and Nevis	8,210	1			
Croatia	8,060	2			
Slovakia	7,950	1			
Palau	7,630	1			
Mexico	7,310	2			
Poland	7,110	1			
Lithuania	7,050	1			
Latvia	6,180	1			
Chile	5,870	1			
Mauritius	5,260	1			
Costa Rica[a]	5,490	1			
Botswana[a]	5,180	2			
South Africa	4,960	1.5			
St. Lucia	4,900	1			
Panama	4,630	1.5			
Argentina	4,470	2			
Uruguay	4,360	1			
Grenada	3,920	1.5			
Romania	3,830	2			
Dominica	3,790	1			
St. Vincent and Grenadines	3,590	1.5			
Belize	3,500	1.5			
Brazil	3,460	2			
Jamaica	3,400	2.5			

[a]Long-term democracy

democracies. These data are *consistent* with what our hypothesis predicted we would find.

Our collection of evidence bearing on the hypothesis is by no means finished, however.

> In scientific hypothesis testing, it is never sufficient just to look for evidence that *confirms* the hypothesis or to terminate our research after finding such evidence. We must also look for evidence that might *contradict* the hypothesis.

The quest for information contrary to our prevailing assumptions is vital to all forms of logical argumentation. Most scientists would go even further and say that science itself consists above all in the formulation and testing of generalizations that are capable of being empirically *falsified*.[14]

We must therefore try to find evidence of (a) democracies that are *not* wealthy or relatively wealthy, and (b) nondemocracies that *are* wealthy or relatively wealthy.

As it happens, quite a few democracies (with a combined political and civil rights index of 1 to 2.5) are categorized as lower-middle-income or low-income economies, as indicated in table 3.5 on page 87. One of the poorest (and largest) countries in the world—India—has sustained democratic procedures for most of its existence as an independent country since 1947. (Democracy in India was briefly suspended in the 1970s. See chapter 15 for an outline of India's political development.) There are also more than a dozen lower-middle-income and low-income countries classified as semi-democracies (see table 3.6 on page 88).

The existence of so many democracies and semi-democracies in the lower-middle and low-income

TABLE 3.3

Low-Income Semi-Authoritarian and Authoritarian Regimes

(2005 Political/Civil Rights Index of 4 to 5.5 for Semi-Authoritarian Regimes, 6 to 7 for Authoritarian Regimes; 2005 Per Capita GNI of $875 or Less)

Semi-Authoritarian Regimes			Authoritarian Regimes		
Country	**Per Capita GNI**	**Political/Civil Rights Index**	**Country**	**Per Capita GNI**	**Political/Civil Rights Index**
Bangladesh	$970	4	Ivory Coast	$840	6
Republic of Congo	950	5	Sudan	640	7
Bhutan	870	5.5	Vietnam	620	6
Pakistan	690	5.5	Uzbekistan	510	7
Comoros	640	4	Haiti	450	6.5
Yemen	600	5	Laos	440	6.5
Mauritania	560	5	Zimbabwe	340	6.5
Nigeria	560	4	Eritrea	220	6.5
Zambia	490	4	Democratic Republic of Congo	120	6
Kyrgyzstan	440	4.5			
Burkina Faso	400	4	Burma (Myanmar)	Estimated low income	7
Chad	400	5.5			
Cambodia	380	5.5	Equatorial Guinea	Estimated low income	6.5
Guinea	370	5.5			
Central African Republic	350	4.5	Somalia	Estimated low income	6.5
Togo	350	5.5			
Tajikistan	330	5.5			
Gambia	290	4.5			
Uganda	280	4.5			
Nepal	270	5.5			
Rwanda	230	5.5			
Ethiopia	160	5			
Malawi	160	4			
Liberia	130	4			
Burundi	100	4			
Afghanistan	Estimated low income	4.5			

categories runs counter to our expectations. This mundane analytical detail contains a powerful real-world lesson: the countries listed in tables 3.5 and 3.6 provide incontrovertible evidence that *poverty does not constitute an insurmountable barrier to democracy.* Whereas a relatively low-income economy may indeed make it more difficult for a country to build and sustain democratic institutions and practices, by no means does it doom its chances irreparably.

An equally important political lesson emerges from table 3.7 on page 88. It lists high-income and upper-middle-income countries that were *not* full-fledged democracies or even semi-democracies in 2005. The information presented in this table *contradicts* our expectation that wealthy countries are likely to be democracies that guarantee a high level of political and civil rights. These data also contradict our expectation that upper-middle-income countries are likely to be democratic or at least semi-democratic. The obvious lesson to be gleaned from these figures is that *national wealth provides no guarantee of democracy.* It doesn't even provide a guarantee against highly repressive authoritarianism and

TABLE 3.4

Lower-Middle-Income Semi-Authoritarian and Authoritarian Regimes

(2005 Political/Civil Rights Index of 4 to 4.5 for Semi-Authoritarian Regimes, 6 to 7 for Authoritarian Regimes; 2005 Per Capita GNI of $876 to $3,465)

Semi-Authoritarian Regimes			Authoritarian Regimes		
Country	**Per Capita GNI**	**Political/Civil Rights Index**	**Country**	**Per Capita GNI**	**Political/Civil Rights Index**
Kazakhstan	$2,930	5.5	Iran	$2,770	6
Tunisia	2,890	5.5	Belarus	2,760	6.5
Algeria	2,730	5.5	Swaziland	2,280	6
Jordan	2,500	4.5	China	1,740	6.5
Guatemala	2,400	4	Syria	1,380	7
Maldives	2,390	5.5	Cameroon	1,010	6
Tonga	2,190	4	Turkmenistan	Estimated low income	7
Morocco	1,730	4.5	Cuba	Estimated low income	7
Armenia	1,470	4.5	North Korea	Estimated low income	7
Egypt	1,250	5.5			
Azerbaijan	1,240	5.5			
Angola	1,350	5.5			
Djibouti	1,020	5			
Iraq	Estimated low income	5.5			

TABLE 3.5

Lower-Middle-Income and Low-Income Democracies

(2005 Political/Civil Rights Index of 1 to 2.5)

Lower-Middle-Income (2005 Per Capita GNI of $876 to $3,465)			Low-Income (2005 Per Capita GNI of $875 or Less)		
Country	**Per Capita GNI**	**Political/Civil Rights Index**	**Country**	**Per Capita GNI**	**Political/Civil Rights Index**
Bulgaria	$3,340	1.5	Lesotho	$960	2.5
Namibia	2,990	2	India	720	2.5
Marshall Islands	2,930	1	Senegal	710	2.5
Serbia and Montenegro	2,680	2.5	Mongolia	690	2
Peru	2,610	2.5	Benin	510	2
El Salvador	2,450	2.5	Ghana	450	1.5
Micronesia	2,300	1	Sao Tome and Principe	390	2
Suriname	2,280	2			
Dominican Republic	2,370	2	Mali	380	2
Samoa	2,090	2			
Cape Verde	1,870	1			
Vanuatu	1,600	2			
Ukraine	1,520	2.5			
Kiribati	1,390	1			
Indonesia	1,280	2.5			

TABLE 3.6

Lower-Middle-Income and Low-Income Semi-Democracies

(2005 Political/Civil Rights Index of 3 and 3.5)

Lower-Middle-Income (2005 Per Capita GNI of $876 to $3,465)			Low-Income (2005 Per Capita GNI of $875 or Less)		
Country	**Per Capita GNI**	**Political/Civil Rights Index**	**Country**	**Per Capita GNI**	**Political/Civil Rights Index**
Fiji	$3,280	3.5	Moldova	$880	3.5
Macedonia	2,830	3	East Timor	750	3
Thailand	2,750	3	Papua-New Guinea	660	3
Ecuador	2,630	3	Solomon Islands	590	3
Albania	2,580	3	Kenya	530	3
Bosnia-Herzegovina	2,440	3.5	Tanzania	340	3.5
Colombia	2,290	3	Mozambique	310	3.5
Georgia	1,350	3	Madagascar	290	3
Philippines	1,300	3	Niger	240	3
Paraguay	1,280	3	Sierra Leone	220	3.5
Honduras	1,190	3	Guinea-Bissau	180	3.5
Sri Lanka	1,160	3			
Bolivia	1,010	3			
Guyana	1,010	3			
Nicaragua	910	3			

TABLE 3.7

Upper-Middle-Income and High-Income Semi-Authoritarian and Authoritarian Regimes

(2005 Political/Civil Rights Index of 4 to 4.5 for Semi-Authoritarian Regimes, 6 to 7 for Authoritarian Regimes)

Upper-Middle-Income (2005 Per Capita GNI of $3,466 to $10,725)			High-Income (2005 Per Capita GNI of $10,726 and Above)		
Country	**Per Capita GNI**	**Political/Civil Rights Index**	**Country**	**Per Capita GNI**	**Political/Civil Rights Index**
Oman	$9,070	5.5	Singapore	$27,490	4.5
Lebanon	6,180	4.5	Kuwait	24,040	4.5
Libya	5,530	7	Saudi Arabia	11,770	6.5
Gabon	5,010	5	Bahrain	Estimated high income	5
Malaysia	4,960	4	Brunei Darussalem	Estimated high income	5.5
Venezuela	4,810	4	Qatar	Estimated high income	6
Russia	4,460	5.5	United Arab Emirates	Estimated high income	6

flagrant abuses of fundamental political and civil rights.

We now have conflicting evidence bearing on our hypothesis. Most of the high-income countries of the world are democracies; indeed, this income category has by far the highest concentration of long-term democracies. Moreover, a large number of lower-middle-income and poor countries are semi-authoritarian or authoritarian. These facts are *consistent* with our hypothesis.

But some high-income countries and a few upper-middle-income countries are not democracies or even semi-democracies. In addition, a substantial list of lower-middle-income and even poor countries *are* democracies or semi-democracies. These data are *inconsistent* with our hypothesis: they

contradict our expectations. Our next step is to determine what conclusions we can draw from this conflicting evidence.

Drawing Conclusions from the Evidence

The first question we are tempted to ask when drawing conclusions from the available evidence is whether we have "proved" that our hypothesis is correct. The term *proof* implies absolute certitude, however, and most scientists doubt that we can ever prove anything with complete certainty. For one thing, the evidence we collect, no matter how exhaustive our search, may not be enough to permit a final verdict on the *universal* validity of our conclusions. (A proposition is *universally* valid if it applies to *all* relevant cases.) Even if all the evidence at our disposal confirms our hypothesis, there may still exist contrary evidence of which we are unaware. Instead of boasting that the evidence conclusively "proves" that a hypothesis is correct, therefore, we'll have to settle for the more modest conclusion that the evidence is *consistent* with the hypothesis. Any conclusion that a hypothesized relationship is "true" can only be tentative.

It is easier to *disprove* the universal validity of a hypothesis than to prove it. If we can find any evidence at all that is contrary to the results predicted by the hypothesis, we can demonstrate that the hypothesized relationship is not *universally* valid. The relationship may be valid sometimes, but not always. In some instances we can show that the hypothesis is *never* valid. In any event, evidence that is contrary to the results predicted by the hypothesis is designated simply as *inconsistent* with the hypothesis.

> When drawing conclusions from our evidence, we have to distinguish between evidence that is *consistent* with our hypothesis and evidence that is *inconsistent* with it.

In some cases our evidence will be entirely one or the other. But in many cases it will cut both ways: some of it will be consistent with the hypothesis, some inconsistent. In these cases the results of our research are *mixed* and lead us to conclude that the hypothesis appears to be partly true and partly false. (At times the evidence may be *mostly* true or *mostly* false.) If possible, we then need to specify the conditions under which the hypothesis is correct and those under which it is not.

In yet another set of cases, the evidence may be so evenly mixed, confusing, or simply inadequate as to be *inconclusive:* we cannot really be sure whether our hypothesis is true or false, or to what extent it is the one or the other. In these cases, our final conclusion must be "we don't know." Frustrating though it may be, "we don't know" is sometimes the right answer in science. *Science is characterized not by the certitude of its results but by the logic of its methods.* Its value is just as great when it shows us what we do *not* know as when it points out what we do know with considerable confidence.

Taking these general observations into account, let's now draw some conclusions from the evidence we've garnered on democracies and national wealth. To begin with, we have evidence that is both consistent and inconsistent with the hypothesized relationship between democracy and national wealth. There are relatively wealthy democracies as well as nondemocracies; there are relatively poor democracies as well as nondemocracies. Taken in its entirety, therefore, the evidence we have examined is *mixed:* some of it supports the hypothesis, some contradicts it. The evidence we have seen does not consistently and exclusively link relative wealth with democracy, nor does it conclusively rule out a relationship between these two variables.

Nevertheless, we can still discern some broad patterns. The overwhelming majority of the highest-scoring long-term democracies are clustered in the high-income category. Very authoritarian regimes (with a rating of 6 or 7) tend to be clustered in the low-income category. These data tell us that, *as a general tendency*, national wealth is a correlate of democracy (but not always).

Establishing a correlation between variables is a vital first step in the direction of demonstrating a causal relationship between them. If there is no evident relationship of any kind, obviously there can be no causal one. Keep in mind, however, that *a correlation does not by itself establish causality.* To what extent does our evidence demonstrate that national wealth "promotes" democracy in the sense that it actually *causes* democracy to come about or endure? At this point we need to consider a few basic

principles of causal inference and the process of reasoning by induction.

Induction As we noted earlier, *induction proceeds from the specific to the general. It is the process of drawing conclusions or generalizations from specific information or evidence.* The inductive process is also characterized by the fact that, unlike deduction, *the evidence does not lead to logically determined conclusions.* Rather, the facts may be consistent with two or more possible conclusions, some perhaps closer to the actual truth than others. Our specific information on democracy and national wealth, for example, does not logically compel us to conclude that national wealth always promotes democracy. It merely suggests that wealth *may* promote democracy, but only in certain cases, if then. Drawing conclusions from empirical tests of hypotheses in political science is often an inductive process. In these cases, whatever conclusions we are able to draw from our evidence can only be tentative and uncertain; the laws of logic provide no ironclad guarantee of their validity.

Indirect Hypothesis Testing Notice that we did not test our hypothesis, "National wealth promotes democracy," directly. We did not directly observe a single case in which national wealth clearly caused a democracy to come about when none existed before or caused an existing democracy to remain in existence over a protracted period of time. All we did was to categorize the countries of the contemporary world by income group and type of government to see if any patterns emerged. We did not undertake in-depth investigations of these countries individually to see if wealth really does account for the presence or absence of democracy in each case, and if it does, *how* it does so. We never directly looked for evidence demonstrating the editorialist's contention that wealth promotes democracy by promoting education, mass communications, a middle class, or a government responsive to its citizens' demands.

Although the data we presented on nearly 200 countries displays a general pattern linking wealth and successful, long-term democracies, they do not permit us to conclude that wealth *always* promotes democracy. They don't even permit us to conclude that wealth is definitely responsible for creating or sustaining democracy in any of the wealthiest democracies listed in table 3.2. The data simply tell us that wealth is *associated* (or *correlated*) with the most successful democracies as a general rule. Although this correlation is consistent with the hypothesis that national wealth promotes democracy, the evidence does not *definitively* demonstrate that the hypothesis is true. That conclusion would be a *false inference.*

Most of the hypotheses we test in political science are tested indirectly, not directly. Especially when we look at aggregate data for a variety of countries, the best we can do is draw tentative inferences from whichever general patterns we can discern. Case studies of individual countries would give us deeper, more detailed information about whether, and how, national wealth actually promotes democracy in practice. In other words, we would have to undertake in-depth examinations of the relationship between national wealth and democracy in, say, the United States, Japan, or other democracies to see if (and how) wealth actually *promotes* democracy. But individual case studies are usually too narrowly focused to enable us to draw grand conclusions about the relationship between wealth and democracy *in general.* Such studies typically cannot show us how this relationship might apply to all or most of the nations of the world in different historical periods. Once again, we are forced to be very modest about the scope and certitude of our knowledge.

Multicausality Sometimes a phenomenon has only one cause. Heat alone, for example, causes ice to melt. But far more often, even in the natural world, events occur because of a multiplicity of causes. These multiple causes can work simultaneously or in different sequences; they can work in a variety of combinations and quantities. Political and social phenomena, in particular, rarely have only one cause; in human affairs, *multicausality* is far more likely than monocausality. Whether we are trying to explain democracy, dictatorship, voter turnout, economic growth, or why nations go to war, two or more independent variables typically account for the dependent variable we are trying to explain. Thus the level of national wealth *by itself* may not account for democracy or its absence in any of the countries listed in our tables.

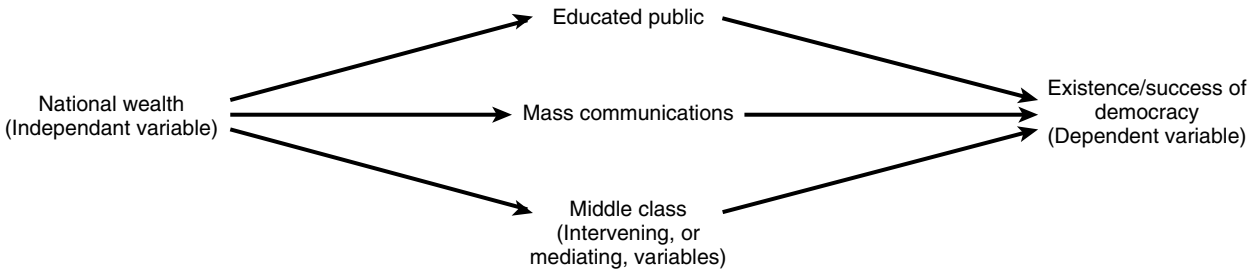

FIGURE 3.14 Intervening Variables Between National Wealth and Democracy

Conceivably, national wealth may promote democracy by working through other variables that may play a more direct role in stimulating the birth of a democracy or in undergirding a successful democracy over time. In a major work on this topic, Seymour Martin Lipset suggested that such variables as an educated public, mass communications, and a politically active middle class may ultimately depend on the size of a nation's wealth, but it is these intervening variables, not wealth per se, that may have a more immediate impact on the fate of democracy. These variables intervene between national wealth and democracy, enabling the one to exert a causative effect on the other, as illustrated in figure 3.14.[15]

The recipe for a successful democracy has so many ingredients that it is virtually impossible to specify which ones are more important than others. In addition to national wealth and the intervening variables it can buy, democracies may need such things as a general respect for the law, a tradition of cooperation and compromise among social groups, a political elite that respects the rights and liberties of the population, and a host of additional factors as well. The precise mixture of these ingredients may vary from democracy to democracy. Rarely, if ever, is democracy simply the product of one sole causal variable. Although the analysis we have just conducted shows a strong association between national wealth and successful democracy, it by no means rules out the possibility that *additional* independent variables (other than those connected with wealth) may also be of crucial significance in accounting for the existence or long-term success of democracies.

In trying to understand political reality, we must always be sensitive to the possibility (indeed the likelihood) of multicausality. Reducing complex realities to just one explanatory variable while paying insufficient attention to other contributing explanations is a logical fallacy called *reductivism*. Reductivism is just as fallacious in everyday political discourse as it is in political science. When we make such statements as "In U.S. politics, race determines everything" or "Big business runs the country," we may be just as reductivist in our reasoning as is someone who would suggest that national wealth alone explains the existence or success of democracy. Before we single out one particular variable as the sole explanation of the phenomenon at hand, therefore, we had better make certain that we have systematically ruled out all other potential explanatory variables. A scientific approach to politics requires us to be on the lookout at all times for multiple sources of explanation and causation in political life and to pay close attention to the ways they interact. To do otherwise is to engage in illogical argumentation and oversimplification.

Necessary and Sufficient Conditions One of the most basic distinctions in the logic of causation is the distinction between *necessary* and *sufficient* conditions.

A **necessary condition** ***is one that* must *be present in order for some phenomenon or event to occur; without it, the event cannot occur.*** A certain amount of sunlight is a necessary condition for most plant growth. By itself, however, sunlight may not be sufficient to ensure the steady growth of a plant to maturity. Anyone who raises tomatoes or houseplants knows that regular watering may also be necessary.

A **sufficient condition** ***is one that* by itself *suffices for the phenomenon to occur.*** When a sufficient condition is present, the phenomenon *must*

occur. It is not necessary, for example, to focus sunlight on paper through a magnifying glass in order to ignite a fire. Striking a match or spontaneous combustion is just as incendiary. Any one of these methods, however, is *sufficient* to start a fire.

Some causative agents are both necessary *and* sufficient conditions simultaneously. The gravitational attraction of the Earth and the moon are both necessary and sufficient to cause the tides to change.

Other agents may exert a discernible causative effect on phenomena, but are neither necessary nor sufficient to cause the observed outcomes. Numerous studies show that smokers contract lung cancer at significantly higher rates than nonsmokers. Yet smoking is not a necessary condition for lung cancer, since nonsmokers also contract the disease. Nor is smoking a sufficient cause for lung cancer, since smoking does not always result in cancer; many lifelong smokers remain cancer-free all their lives. As a consequence, scientists prefer to call smoking a "risk factor" that is "strongly correlated" with cancer.

Is a high level of national wealth a necessary or sufficient condition for democracy? The data presented in the tables show that it is neither. Costa Rica, a lower-middle-income country, has been relatively successful in maintaining democratic electoral procedures since 1949. This country provides evidence that a relatively high level of wealth is not absolutely *necessary* to build and sustain electoral democracy. By implication, factors other than those that depend on national wealth may be very important in creating a democracy and even sustaining it over many decades. We'll have to look specifically at fairly poor democracies like India to find out exactly what these democracy-sustaining forces are.

At the same time, our data show that wealth is not *sufficient* to establish or maintain democracy. Fairly rich countries like Saudi Arabia, Singapore, Kuwait, and the United Arab Emirates are not democracies, nor are several countries in the upper-middle-income category, as indicated in table 3.7. The Soviet Union at its peak had the world's second largest GNP after the United States, yet it was never a democracy. Again, by implication, factors in addition to those that depend on national wealth may be necessary to build and sustain democracy. Once more, we'll have to undertake more intensive country-by-country investigations to identify these variables.

To what extent, then, does the information presented here permit us to conclude that national wealth "promotes" (or "causes") democracy? The best answer we can give is that *national wealth is strongly correlated with democracy and therefore increases the likelihood of democracy.* As Lipset concluded in his pioneering work, "The more well-to-do a nation, the greater the chances that it will sustain democracy." Conversely, the poorer a country is, the *less likely* it is that it will have or sustain democracy. The correlation is not perfect, however; as we have seen, there are exceptions to it.

Furthermore, the data do not tell us exactly when a new democracy will come into existence, replacing some form of authoritarianism. As Adam Przeworski and his co-researchers have demonstrated in a study that looks at the relationship between wealth and democracy over a forty-year period, democracy by no means arises automatically once a country passes a certain threshold of national wealth. Factors other than wealth—such as concrete actions taken by political forces that want democracy—can be even more important than economic factors in forging a democracy where none existed previously. Wealth is important primarily in sustaining democracy over the long term in countries where it already exists, the study concludes.[16]

The evidence at hand tells us that national wealth *tends* to promote and sustain democracy and increases the *chances* for democracy. But it does not *determine* that democracy will actually come about, or even necessarily succeed, over the long run.

PARADOXES OF CAUSATIVE LOGIC

As the preceding hypothesis-testing exercise has shown, demonstrating causation is not easy. We now come to a great paradox of scientific logic: *although one of the most important aims of science is to discover the causes of things, causation is one of the most difficult of all phenomena to demonstrate conclusively.* This paradox is especially evident in political science, where we are dealing with so many interacting variables. Only rarely in political life do we

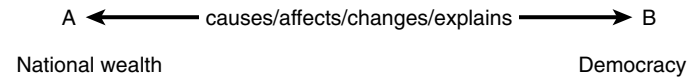

FIGURE 3.15 Reciprocal Causation

come upon an instance in which A demonstrably causes B, necessarily and sufficiently. It is far more likely that B is caused by more than one factor.

To make things even more complicated, we may confront the conundrum of the chicken and the egg. Evidence indicating a strong correlation between A and B does not necessarily mean that A is a cause of B; it could mean that B is a cause of A. Thus the data presented in this chapter may not be telling us that national wealth tends to promote democracy; rather, it may be indicating that democracy promotes national wealth. Alternatively, A and B could be related in a mutually reinforcing *interactive* process known as *reciprocal causation*. In that case, national wealth promotes democracy, and democracy in turn raises national wealth (see figure 3.15). To learn exactly which is causing which, and *how* these processes work, we have to look more deeply into specific cases and observe the relationship between national wealth and democracy in individual countries, and then compare the results. The systematic comparison of such individual cases is one of the main activities of comparative politics.

Political science must also contend with another problem: *it is rarely able to test its hypotheses under controlled laboratory conditions.* Whereas natural scientists can frequently test their hypotheses in scrupulously controlled experiments by manipulating their lab rats, chemicals, and atom-smashing devices as they wish, political scientists are seldom so fortunate. In some cases we can exercise a modicum of control over our variables. We can conduct focus group surveys or elite interviews with a manageable number of individuals, for example, and derive some generalizations about politics from their responses to our questionnaires. Even these kinds of studies have problems. Our respondents may misinterpret our questions, or their responses may be ambiguous and hard to interpret. Still more problematically, we must often test our hypotheses against whatever factual information we can dig up from the uneven ground of historical and contemporary reality. The information we may need in order to come to reliable conclusions may be insufficient or unreliable. The generalizations we make from this patchy evidence are all the more uncertain as a result.

And so we come to another paradox: *political science seeks to generalize about politics, but most of our generalizations are at best tentative or only partially valid.* It often happens in political science that our efforts to make clear-cut, universally valid generalizations run into empirical evidence of considerable complexity. Some of our generalizations apply only under certain conditions; there are exceptions to most every rule. It is vitally important to specify what these conditions are and why the exceptions occur. Paradoxically yet again, *defining the limits of our generalizations is a major purpose of scientific generalization itself*.

Thus the scientific approach to politics cautions us to be modest in our claims to political certitude. Political science teaches us that, when it comes to making explanatory generalizations about politics, *uncertainty is more likely than certainty.* This lesson is an important one. In every science, recognizing the limits of our knowledge is the start of wisdom.

THE PRACTICAL IMPORTANCE OF HYPOTHESIS TESTING

In spite of the difficulties of causative logic, hypothesis testing is still a powerful analytical mechanism for understanding politics. It compels us to be explicit in our use of political terminology. It makes us check our generalizations against available evidence. It forces us to consider evidence *against* our prevailing assumptions and biases, not just evidence supporting them. It requires us to be systematic and logical in analyzing the evidence and drawing conclusions from it. It clarifies what we know, and what we don't know, about political life.

The logic of hypothesis testing is therefore essential to political science. But the benefits of hypothesis testing are by no means confined to the ivory-tower world of academic abstractions. They have an immense practical value as well. In the real

world of political action and debate, politicians, pundits, and ordinary people hold all sorts of opinions on all sorts of political issues. Not uncommonly, people cling to their most cherished political beliefs with unshakable obstinacy, regarding their certainty as beyond question. In actuality, however, a great deal of what people know (or think they know) about politics really amounts to *hypotheses:* assumptions, impressions, or hunches that in many instances are only vaguely articulated or insufficiently examined. Many of us, for example, have heard such platitudes as "The longer politicians stay in office, the more they are out of touch with public opinion," or "Governments just waste money," or "Foreign aid does not work," or countless other generalizations about politics that animate everyday political discussion. Political scientists are not the only ones who like to generalize about politics; politicians and average citizens do, too. Such generalizations frequently provide the underlying rationale for important decisions political leaders make and for the way people behave within their respective political systems. But are those generalizations true? Only a systematic analysis of the evidence can tell us.

Consider as an example the editorialist's recommendation that wealthy democracies should provide economic assistance to newly democratizing countries. How do our findings about the relationship between national wealth and democracy help us formulate our own opinion on this practical policy issue? As we saw, national wealth is strongly—but not perfectly—correlated with democracy. But we also saw that national wealth per se does not necessarily promote democracy; only when it is funneled into such intervening variables as education, an open communications system, or a middle class is wealth more likely to strengthen the conditions for democratic rule. And we also concluded that factors *other than* wealth may also be necessary to build and maintain democratic modes of government.

Thus our empirical analysis compels the conclusion that economic assistance aimed at raising the national wealth of democratizing countries may indeed be very helpful in supporting democracy, but it provides no guarantee that democracy will actually succeed. A great deal depends on how the money is spent. Will it be used to expand education or encourage the growth of a prodemocracy middle class? Or will it be spent on things that do not necessarily increase the chances for democracy, such as higher salaries for bureaucrats or graft for corrupt politicians? In any event, if key elites or broad segments of the population simply do not want democracy or do not try to make it work, wealth alone may not save the democratic cause.

Unfortunately, not everybody subjects their generalizations to a systematic reality check as we've just done. As a consequence, the generalizations people commonly make about politics often tend to oversimplify matters. But testing our political assumptions against reality is precisely what a scientific approach to politics demands. Applying scientific logic to the study of politics helps us avoid oversimplification and enables us to appreciate the complexities of the real world.

Accordingly, one of the most important "scientific" questions we can ask about any political generalization is, *"What is the evidence to support it?"* Another is, *"What is the evidence against it?"* We must then be very cautious and scrupulously logical in interpreting the results of these inquiries.

COUNTERINTUITIVE RESULTS

Systematic hypothesis testing is especially interesting when its results are *counterintuitive.* **Counterintuitive results** ***are those that run counter to what we expect.*** Not infrequently, they contradict widely held preconceptions or what "everybody knows" on the basis of "common sense." For centuries, "everybody knew" that the Earth is flat. Evidence to the contrary was counterintuitive. Though perhaps less dramatic, hypothesis testing in political science can also yield counterintuitive outcomes. Quite a few generalizations people make about politics on the basis of "common sense" or personal experience turn out, on examination, to be either completely false or true only in certain instances. Here are a few examples:

- Democracy, it is widely assumed, is government "by the people," not by elites. Comparative studies of democracies show, however, that elites may be even more important than the people are in creating and sustaining democratic modes of government. In some cases, elites are more respectful

of democratic values—such as tolerance and freedom of speech—than the general public is.
- Another widely held assumption about democracy is that people will take full advantage of the opportunities it offers to stand up for their rights and actively promote their interests through the political process. In fact, however, most people in democracies do *not* engage in such "collective action," even when their own economic interests or other concerns are at stake. Ironically, they are far more likely to believe that their personal interests are best served by doing nothing.
- It is often assumed that revolutions and mass uprisings against unpopular governments are most likely to take place when the population hits bottom, that is, when poverty and political subjugation reach intolerable extremes. In reality, however, revolutions and mass unrest are more likely to take place after a noticeable improvement has taken place in living conditions. It is not the extremely poor who most often rebel, but people who are experiencing "rising expectations" of still more improvements. Their anger may reach the boiling point when these expectations are then frustrated.

Scientific hypothesis testing is also important for another practical reason: *it can help you examine your own political assumptions in a rational and coherent manner.* One of the main objectives of your political science education should be to learn how to spell out your own political ideas in terms of propositions that can be put to a systematic test against the facts. Critical-thinking skills of this kind are invaluable in dealing not only with empirical questions about politics but with normative issues as well. As we noted earlier in this chapter, our political values and ideals need to be addressed with reference to the realities of political life. The rules of hypothesis testing provide a method for determining what those realities are and for clarifying how well we know them.

SOME CONCLUDING THOUGHTS

Now that you have examined some key scientific terminology in political science and walked through a hypothesis-testing exercise, you should have a better idea of what political science is. Of course, you won't get a deeper feel for it until you've studied it more thoroughly, but you should at least be in a position to appreciate some generalizations about what political science tries to do.

Let's emphasize what political science is *not.* First, it is not "just opinion." Although the study of politics usually provides ample opportunities to formulate and express one's personal political views, political science *as an empirical science* insists on the observance of strict rules of collecting, analyzing, and interpreting the facts. It requires us to support our opinions with relevant evidence and to modify our opinions (or perhaps discard them entirely) in the light of contrary information. Thus political science does not regard all political opinions as equally valid. Those opinions that can meet the acid test of empirical reality checks based on the rigors of scientific logic are generally more valid than are those based on insufficient evidence or faulty logic.

Of course, sometimes we just do not have the evidence we need to draw a reasoned, "scientific" conclusion. At times the information we need does not exist; at times it may not be readily available. In these cases, it is incumbent on us to *acknowledge* that the evidence we need to substantiate our case is lacking.

Even though the canons of empirical science are demanding, there is still plenty of room for rational debate and disagreement over controversial political issues. Subjective value judgments and preferences invariably play—indeed *must* play—a major role in political thinking. Just as important, the rules of scientific logic open up a vast realm of empirical uncertainty with respect to many political questions. By itself, empirical political science cannot compel you to be a liberal or a conservative, a moderate or a radical. It simply tells you that, whatever your personal political predilections, you must take the rules of scientific logic into account when shaping and defending your political views.

Second, political science is not "just current events," nor is it "just facts" or "just stories." As we indicated in chapter 1, political science is an effort to understand current events as well as the past (and, to some extent, the future) by generalizing about humanity's political experience. Political science *uses* facts to formulate and test these generalizations. Political scientists are just as fascinated or

amused as anyone else by stories and anecdotes about politics, but as social scientists we are mainly concerned with connecting particular incidents to broader trends and processes. In telling stories about politics, we are especially interested in what the stories tell us about politics. Moreover, random facts or *anecdotal evidence* may not be enough to sustain a political generalization. We may need to analyze a vast array of available evidence before we can come to any reliable conclusions. And if the evidence available is incomplete or merely anecdotal, we must say so.

More than anything else, political science is a *mode of thinking* about politics. It is an academic "discipline" in that it disciplines our minds to think in certain ways, in accordance with a specified logic and systematic methods of analysis.

Developing Critical-Thinking Skills

Depending on the career path you take, you may need more advanced analytical skills than we can provide in this book. This volume is purely introductory. In the pages that follow, we do not engage in formal statistical hypothesis testing, nor do we teach you how to design a research project of your own. Rather, we present numerous examples of hypotheses that have been advanced by political scientists who have written on the topics and countries covered in this volume. Along the way we introduce you to key concepts in political science, and to prominent theories and models as they apply to comparative politics. We also expose you to some of the most influential scholarship in the field. Throughout this enterprise, we are guided by one overriding aim: to help you *think for yourself* about politics in terms of the scientific terminology and logic presented in this chapter.

Accordingly, this book provides numerous synopses of scholarly arguments that use the five-step hypothesis-testing logic presented here:

1. Definition of key terms
2. Identification of the variables
3. Expectations of the hypothesis in "if . . . then" form
4. Collection and examination of the evidence
5. Conclusions (*consistent* with the hypothesis, *inconsistent*, *mixed*, or *inconclusive*)

Every chapter that follows contains a hypothesis-testing exercise that employs this format. We hope that by learning how these logical steps are used in comparative politics, you will learn not only how to think like a political scientist but also how to apply these steps yourself to analytical tasks in other areas of inquiry.

KEY TERMS
(In bold and underlined in the text)

Value judgments
Empirical analysis
Variable
Dependent variable
Independent variable
Correlation (association)
Intervening variables
Spurious correlation
Law
Theory
Hypothesis
Model
Ideal type
Paradigm
Fallacy of composition
Tautology
Induction
Deduction
Necessary condition
Sufficient condition
Counterintuitive results

NOTES

1. For an introduction to some of the timeless themes of political philosophy, see Glenn Tinder, *Political Thinking: The Perennial Questions*, 6th ed. (New York: Longman, 2003).
2. For an overview of the field, see Michael E. Kraft and Scott R. Furlong, *Public Policy: Politics, Analysis, and Alternatives,* 2nd ed. (Washington, D.C.: CQ Press, 2006).
3. In *The Grammar of Science*, written in 1892, the scientist and philosopher Karl Pearson wrote, "The unity of all science consists alone in its method, not its material."
4. For postmortem reappraisals of election predictions in 2000, see *PS: Political Science and Politics* 34, no. 1 (March 2001).

5. Maurice Duverger, *Political Parties*, 2nd English ed., rev., trans. Barbara and Robert North (London: Methuen, 1959), 217. See also Duverger's *Party Politics and Pressure Groups*, trans. David Wagoner (New York: Crowell, 1972), and *Introduction à la politique* (Paris: Gallimard, 1964).
6. Anthony Downs, *An Economic Theory of Democracy* (New York: Harper & Row, 1957).
7. Karl W. Deutsch, *The Nerves of Government* (New York: Free Press, 1966).
8. Thomas Kuhn, *The Structure of Scientific Revolutions*, 2nd ed. (Chicago: University of Chicago Press, 1970).
9. For example, there exist rigorous tests for determining the *statistical significance* of particular statistical results. In addition, the relative *strength* of a correlation between dependent and independent variables can be calculated and specified in numerical terms. The resulting *correlation coefficient* is a very useful tool in political analysis. Another statistical technique that is widely used in political science is *regression analysis*, which permits analysts to measure the probable effect of a change (or *variance*) in one or more independent variables on a dependent variable. It is very useful in analyzing voting patterns and other quantifiable relationships.
10. For a concise outline of the scientific approach, see Stephen Van Evera, *Guide to Methods for Students of Political Science* (Ithaca, N.Y.: Cornell University Press, 1997). A more advanced text is Gary King, Robert O. Keohane, and Sidney Verba, *Designing Social Inquiry* (Princeton: Princeton University Press, 1994).
11. For a study of the dangers of false historical analogies, see Richard E. Neustadt and Ernest R. May, *Thinking in Time: The Uses of History for Decision-Makers* (New York: Free Press, 1986).
12. *Freedom in the World 2006* (New York: Freedom House, 2006).
13. World Bank, *World Development Report 2007* (New York: Oxford University Press, 2006), 249–52. The national income statistics reported in this publication, published in September 2006, are preliminary figures for 2005. The World Bank's method for calculating gross national income (formerly gross national product) is in ibid., 265 and 270–71.
14. The philosopher Karl Popper popularized the notion that the essence of the scientific method is empirical falsifiability. See *The Logic of Scientific Discovery* (New York: Harper & Row, 1968).
15. Seymour Martin Lipset, "Economic Development and Democracy," in *Political Man* (New York: Doubleday, 1960), chap. 2.
16. Adam Przeworski, Michael E. Alvarez, Jose Antonio Cheibub, and Fernando Limongi, *Democracy and Development: Political Institution and Well-Being in the World, 1950–1990* (Cambridge: Cambridge University Press, 2000).