CHAPTER

2

Anatomy and Physiology of Theory

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Learning Objectives

- Describe the anatomy and physiology of theory.
  - What are the elements and how do they relate?
- Explain the utility of theory in the study of organization behavior.
- Describe a conceptual model.
  - How do conceptual models relate to theory?
- Describe the importance of theory in relation to other chapters in this book.

INTRODUCTION

The word theory comes from the Greek word *theorein,* which means "to look at" or, "to contemplate the divine." This chapter discusses the anatomy and physiology of theory while providing important tools and skills that will enable the reader to not only understand, model, and describe complex theories, but also have the ability to deconstruct theory into individual components. This is a very important skill for understanding many of the important concepts in the rest of this textbook. Failing to understand theory and theoretical elements will make it very difficult to understand the meaning of other important concepts presented in this book.

Why Study Theory in Organization Behavior?

Understanding the theoretical properties of complex issues is important to burgeoning executives. This is due to the dynamics of the fast-paced world we live in today. Executives are continually placed in positions where it is necessary to have a greater understanding of complex models that relate to organizational life cycles, bureaucracy, institutional dynamics, employee satisfaction, economic demands, and organizational efficiency, effectiveness, and value—to name only a few leader priorities that theory can help forecast and explain. As a result, understanding the value of theory is significant to the survival of any organization. Furthermore, understanding the complex parts and relationships within theory assists executives in framing problems, developing alternatives, and researching solutions. Without an understanding of theory and the roots therein, researchers, executives, and leaders are forced to make decisions based on opinions and individual heuristics rather than science and literature. Individuals who fail to understand the complexities of theory and how to adequately describe, model, and interpret theoretical models to their advantage will have a distinct disadvantage in the modern workforce. Lastly, an understanding of theory is a necessary precursor to building conceptual models in industry. Model building is a necessary precursor to performance-based management development, system examination, policy formulation, and conducting quantitative analysis. However, understanding the process of building empirically measurable models may be one of the more underrepresented aspects in industry today.

This chapter describes what a theory "is," what the individual parts of theory are (anatomy), and how these elements interrelate within a theoretical model (physiology). This chapter also describes how theories can be used to generate hypothesis, appropriate management research questions, and metrics for benchmarking, and process improvement initiatives. Finally, understanding how theories help in the development of conceptual models, assists in developing organization vision, mission, goal, and benchmarking objectives.

WHAT IS THEORY?

Theory is the primordial soup from which research questions, problem statements, and variables of interest are derived. Students should avoid "inventing" their own theory for solving management research. Numerous theories are available in the literature that will help young executives investigate issues relating to organizations, teams, and individuals. This book discusses and describes many such theories.

It is important to know that there is no one accepted definition of theory within the organization behavior literature. In layman's terms, a theory is an advanced form of an idea or an opinion that has some base in the empirical world. A leading theoretical scholar, Samuel Bacharach, has suggested (sic) "that a theory is a statement of relations among concepts within a set of boundary assumptions and constraints." Bacharach also suggests a theory is a coherent narrative composed of assumptions, abstract reasoning, and speculation, which describes and explains observed or experienced phenomenon's constructs, their interrelationships, and their boundaries. Bacharach goes on to suggest that a theory should answer the question of how, when and why, and that a theory should be logically consistent, able to be tested, and subject to disconfirmation (or falsification).[1]

Other authors have suggested that a theory must explain why variables and constructs come about and why they connect, while others suggest that the purpose of theory is to challenge and extend existing knowledge, within the limits of the critical bounding assumptions, through concise organization and clear communication of an idea. Additional authors challenge that the purpose of theory is to bring the components of complex phenomenon together in one understandable whole. Finally, one author has suggested that the purpose of theory is to extend existing knowledge, within the limits of the critical bounding assumptions, through concise organization and clear communication of an idea. [2–4]

Regardless of definition, a theory must be capable of support by qualitative measures or quantitative data. If a theory is incapable of initial development based on qualitative or quantitative properties, the burgeoning theory may not have evolved past the opinion or idea phase and may not be valuable to the profession or the advancement of knowledge.

As the science of organizational behavior has advanced over the last century, scholars have begun to have similar convergent thoughts in reference to theoretical elements and concepts. It is now possible to conceptually represent theory by suggesting biological metaphors. In this regard, elements of theory can be regarded as a biological unit where there is both anatomy and physiology.

Anatomy and Physiology of Theory

The anatomy of theory can be broken down into specific units of analysis. These units include the theory itself, followed by subordinate constructs, variables, and operationalized measures. An environment of discussion surrounds these elements. This enclosure is called bounded rationality. When discussing theoretical constructs, variables, and measures, it is first necessary to frame these elements within a plausible discussion group. By framing constructs, variables, and measures in a bounded rationality, an "out-of-bounds" area is presented that helps researchers stay within certain parameters of discussion.

Contained within this bounded rationality is the physiology of theory. The physiology of theory describes the interaction among constructs, variables, and measures, as well as other elements. In this regard, the interaction of constructs within theory is helpful for developing propositional statements. This is important in the early stages of qualifying theoretical relationships before quantitative data is available for testing or disconfirmation. Forming a more concrete and testable relationship within theory are the relationships between variables known as hypotheses. Propositional and hypothetical relationships are discussed in detail later in the chapter.

Also, contained within the bounded rationality of theory are contextual factors and confounders. Contextual factors are generally known elements that exist in the same environment as constructs, variables, and measures. The interaction of contextual factors on certain constructs and variables may be known in advance and can be controlled for through awareness and intervention. Confounders are properties in the environment that are generally not known in advance and may have interactive effects with theory that are not forecasted—or are difficult to predict.

Figure 2-1 depicts theory as a conceptual model for visual representation and understanding. A conceptual model is a "conceptual description" of the key elements of a study. The conceptual model should be parsimonious (simple) and offer graphic representations of theoretical elements that help outsiders understand the issue(s) being investigated at a glance. A conceptual model may include the actual theory, as well as constructs,

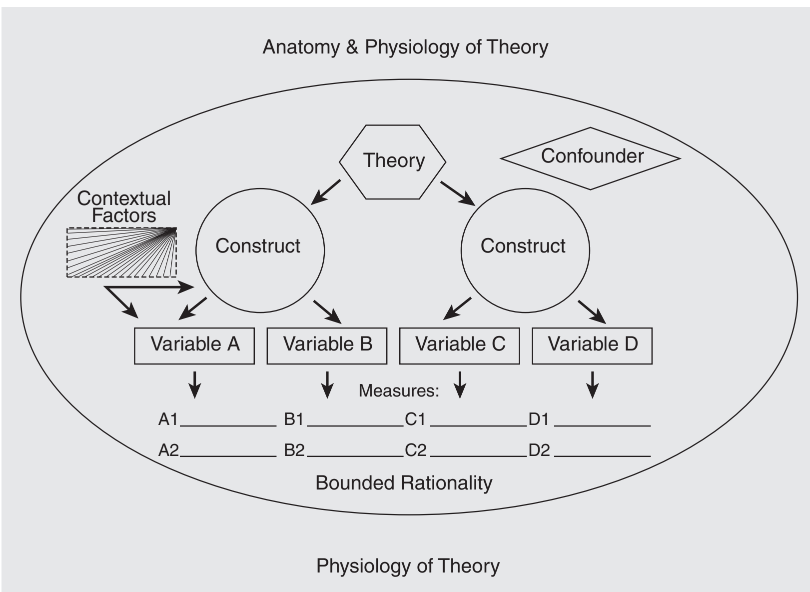

Figure 2-1 Conceptual Model of Theory.

variables, measures, confounders, and contextual factors; however, some conceptual models may only consider specific constructs as well as certain elements specific to the unit of analysis under study. Many of the models presented in this text will include a discussion of the actual theory itself, while other models may only present constructs for discussion.

The modeling of theory in Figure 2-1 is based on the early work on model building suggested by Bacharach, empirical measurement techniques in healthcare suggested by Wan, as well as other authors who have suggested that theoretical models should be simple, elegant, and consistent. This pictorial description and the relationship between theoretical parts will become clearer as the chapter progresses. [5–7]

ANATOMY OF THEORY

Constructs

The building blocks of theory are constructs. Throughout this text, students will encounter dozen of constructs. As a result, it is critical to the study of organization behavior to have a clear understanding of what a construct is. Failing to have a clear understanding of constructs will result in an inability to understand many of the concepts in subsequent chapters of this book.

Before defining a construct, it is first necessary to establish a *rule* for how constructs relate to theory. One constraint is that a valid theory must be capable of identification through at least two constructs. Failing to identify a theory by at least two constructs (similar to Figure 2-1), results in what scholars call tautology. Tautology implies a never-ending redundant cycle. The classic tautological statement is, "The sky is blue because it reflects the ocean, while the ocean is blue because it reflects the sky." This statement fails to clarify where the *blue* came from—the sky or the ocean. As a result, we are left in a revolving argument with no resolution. Accordingly, in order to adequately discuss theoretical properties, it is necessary to have two or more constructs in order to properly frame theoretical concepts and issues.

By definition, a construct is a latent variable that lacks empiricism (taste, touch, sight, smell, sound). Elements that are empirical have tangible, physical properties. For example, an apple possesses empiricism insofar that it can be tasted, touched, seen, and smelled. It does not matter that the apple does not make *noise*. Because an apple possesses four of the five empirical senses, we can say that an apple is not a construct because it can be rationalized through empirical properties. Any physical element or property that can be described through at least one of the five senses does not qualify as a construct.

A classic example of a construct is quality. Quality is a construct that cannot be discussed without identifying it through other measurable properties or variables. The classic statement "quality is in the eye of the beholder" generalizes the difficult problem we have describing quality. The discussions of other latent variables (such as efficiency, effectiveness, performance, satisfaction, organizational survival, leadership, success, and motivation) are all examples of constructs. This book discusses many of these constructs that cannot be universally discussed without first assigning empirical properties to them. The empirical property used to describe constructs is variables.

Variables

Flowing from constructs are variables. Variables are empirical units that are capable of identification through one of the five senses. Accordingly, a variable is an element that has precise meaning in the physical world. Generally, variables are universally understood and easily described. *Weight* is a good example of a variable. When discussing the concept of weight with peers or colleagues, universally understood concepts of pounds, ounces, or tons are immediately recognized as valid descriptors of weight. If a variable is incapable of a generalized descriptor, it may cause problems in describing theory. However, if the builder of the theoretical concept makes a careful argument for the use of certain variables—and defines them appropriately—the variable may have utility in helping frame the model. Similar to the tautological rule discussed previously, each construct within a theoretical model must be described using two or more variables.

Measures

Operationalized measures derive from variables. Measures are operationalized descriptions of variables that must be capable of numerical identification. Operationalizing is the process of quantifying a variable using appropriate, numerical-descriptive terms. Additionally, measures must be universally understood and are classically categorized as continuous (1 to *n* with *n* equal to infinity), dichotomous or binary (yes or no, on or off, etc.), or finally, categorical (such as Caucasian, African American, Latino, etc.). If measures are incapable of being operationalized through continuous, dichotomous, or categorical identification, the measure may not have enough precise significance to be valid in describing or testing the theoretical model under study.

Variables should be capable of several different methods of operationalization. For example, the variable *age* can be operationalized as a continuous, categorical, or a binary variable depending on how the researcher chooses to define and measure the age variable. The following section discusses this process.

Operationalizing Measures

In order to operationalize the variable age, we first must associate the variable with a specific unit of analysis (such as an organization, team, or individual). Next, we create a brief definition of the variable age that supports the unit of analysis under study. For example, we may say that age is defined as the number of years associated with a human individual's life. This statement includes two important features. One, it qualifies age in terms of years. Secondly, it provides a reference group for age where a potential range for a life span is universally understood. Given this information, it is possible to operationalize age in several different ways: One, as a continuous variable; two, as a binary variable; and three, as a categorical variable, Table 2-1.

In Table 2-1, we arbitrarily establish cutoff points for categorical and dichotomous variables that help support the issue under study. The categorical description of age could have also been classified using quarter century marks or separated by five-year increments. The selection of a category is up to the executive analyzing the data. Finally, if the executive is interested in partitioning Medicare recipients from non-Medicare recipients, the age break at 65 provides opportunity to analyze the two different groups.

Not all variables lend themselves to operationalized measures through all three metrics. For example, the variable *racial category* does not lend itself to a continuous measure. The most appropriate nomenclature for race is a category where the researcher selects racial categories of interest in the study for analysis.

The process of operationalizing measures is critically important in the business world. A requirement to gather, manage, and measure outcomes from data is a continuous process. However, before collecting and analyzing data, operationalize it in a consistent and logical manner. The Balanced Score Card developed by Kaplan and Norton is an example of a quality tool that requires executives to not only select and define constructs of interest to measure, but also, valid and reliable variables capable of identification through operationalized measures that provide meaningful data for trend analysis.

Similar to variables and constructs, at least two operationalized measures should be considered for each variable in order to avoid tautological issues. While oftentimes it may only be necessary to operationalize a variable one way and achieve finality in the measurement

Table 2-1 Operationalized Age Variable

Define age as the number of years associated with a human individual's life.

Continuous:	1 to *n*.
Categorical:	0–10, 11–20, 21–30, 31–40, 41–50, 51–60, 61–70, 71–80, 81–90, 91–100, $n > 101$.
Binary:	Medicare eligible? Yes or No (with Medicare eligibility being 65 years of age or older).

process, it is always a good idea to strategize alternative methods of measurement for each operationalized measure.

Code Sheets

The last step in operationalizing variables is the construction of a code sheet. Whenever testing variables in a hypothetical relationship, it is not the variables being tested but rather the operationalized units of the variables. This is a necessary precursor to loading data into statistical software like SPSS, SAS, Mimi-tab, or Excel. When we operationalize data for statistical software manipulation, we create code sheets.

A code sheet is a very simple explanation of how operationalized units of a variable will be used in the study. The researcher must keep in mind the assumptions of the test when building a code sheet. For example, parametric and nonparametric tests require different assumptions and these should be considered in the code sheet. While there are numerous examples for building a code sheet to demonstrate how data is operationalized in a study, the below table provides one proven example of success. The following code sheet is created for the variable "education" (Table 2-2).

In this code sheet of a single variable, each column contains very specific and mutually exclusive information about the variable that assists in measuring the theory under study.

1. Label: The actual name of the variable used.
2. Description: Define the variable here.
3. Operationalization: How is it coded?

Contextual Factors

Contextual factors are either variables or constructs that exist in the bounded rationality of the theory under study. Contextual factors generally have a known impact on the suggested relationships within the theoretical model. For example, in the proposed example of a conceptual model of nervousness in Figure 2-2, we can suggest that variables of

Table 2-2 Code Sheet Example for Variable Education

Label	Description	Operationalized
Education	Highest education degree obtained by member	*Categorical* 1 = HS 2 = Community College 3 = 4 yr College 4 = Grad School 5 = PhD 6 = JD 7 = MD

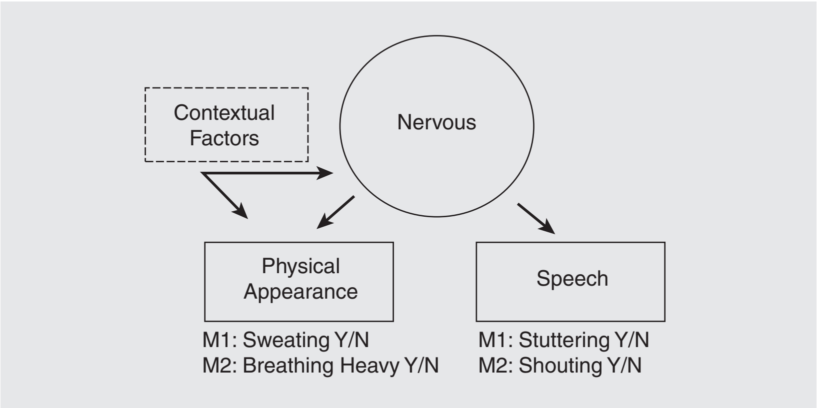

Figure 2-2 Conceptual Model of Nervousness.

physical appearance and an individual's speech pattern may be good indicators of an individual's level of nervousness. We might also suggest that the variables of physical appearance can be operationalized through measures of sweating (individual is or is not) and breathing heavy—a yes or no binary measure as well.

We may continue to suggest that speech is a good indicator of nervousness. If an individual is stuttering (yes or no), and if the individual is shouting (yes or no), the individual may be nervous. It may certainly be reasonable to suggest that if an individual is sweating, breathing heavy, shouting, and stuttering, the person may be nervous.

However, if we fail to take into account contextual factors, such as heat (perhaps it is a 100-degree day), the individual's physical condition (perhaps they are overweight and just walked up several flights of stairs), and the individual's medical condition (perhaps they are hard of hearing and on medication that impairs speech), it is possible to come to a completely incorrect assessment based on physical characteristics. In essence, contextual factors are elements in the environment that affect the outcomes of the constructs or measures we are trying to study. Contextual factors are difficult to identify in advance, but necessary to consider when building conceptual models of phenomenon.

Confounders

Similar to contextual factors, confounders are variables that exist in the bounded rationality of the environment that the researcher is unaware of in advance and cannot control for until after they are identified through alternate means. Confounders are spoilers or wild card factors that are usually identified after a conceptual model is built and testing begins. After confounders are identified through experimental testing or other means, they can be classified as contextual factors and controlled.

The infamous *Butterfly Ballot,* designed in Palm Beach County Florida and used during the 2000 presidential elections, is an excellent example of a confounder when studying voting theory. Local, state, and federal election officials were completely unaware that the unique design of the Butterfly Ballot would result in voter confusion, national controversy, and Supreme Court litigation before it was designed. The fact that it did, classifies the Butterfly Ballot as a confounding variable in the study of voting theory.

The *San Francisco Chronicle* suggested after the 2000 Presidential election that twelve percent of Florida Democrats (over 200,000 individuals) voted for Republican George Bush due to the poorly designed Butterfly Ballot. According to the official 2001 Statistics of the Presidential and Congressional Election of November 7, 2000, George W. Bush beat Al Gore in Florida by 543 votes. Had they discovered this confounding factor and "controlled" for it in advance, the 2000 presidential election would have resulted in a different outcome.

From this example, it is evident that confounding variables can have a significant effect on theoretical and conceptual models. Unfortunately, it is impossible to forecast the grave nature of the effect until after the confounder presents itself. However, once a confounder is identified, it can be recategorized as a contextual factor and controlled for by various means. In the case of the infamous Butterfly Ballot, entire districts in various states moved to completely eliminate paper-voting systems replacing these anachronistic tools with modern electronic voting machines. By doing this, election officials "controlled" for the possibility that voters would punch the wrong hole in a paper record by eliminating the paper record altogether.

The concept of controlling for confounders is a difficult subject and better addressed in a course on experimental design or quantitative analysis. However, an understanding of the likelihood that confounders are present in the environment and can affect assumptive outcomes of models is a necessary tenet of model building.

PHYSIOLOGY OF THEORY

Propositions

The physiology of theory can be described in terms of the relationships within the theatrical model. Two of these relationships are expressed in terms of hypotheses and propositions. A proposition is a statement of opinion, based on some degree of preliminary study or heuristics that is offered as a true or valid statement. While the statement may not always be true or valid, it is offered as such until evidence of disconfirmation is provided. The apomorphism that "Time is Endless" is an example of a propositional statement between constructs, (see Figure 2-3). In this example, Time is one construct and is related to a second construct of

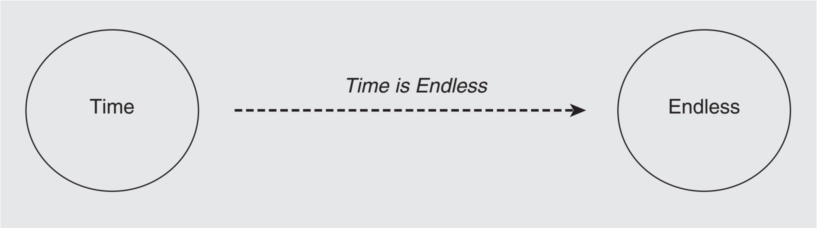

Figure 2-3 Propositional Statement.

Endless in order to form a propositional statement. The propositional statement can be helpful in the development of new opportunities for research and the formulation of new knowledge. The statement also assists in answering questions about the relationships between constructs.

Another classic example of a propositional statement combining constructs is "the right to bear arms." This propositional statement is offered as a statement of fact as is if it was true; however, the interpretive nature of this proposition continues to be readdressed in America every year.

It is no small wonder why the brightest legal minds in our country have debated on the meaning of this propositional statement for over 200 years. This propositional statement has also been interpreted differently by nearly every state in the union. Additionally, there continues to be new interpretive legislation regarding the propositional statement "the right to bear arms" every year (see Figure 2-4).

The difficulty with interpreting this propositional statement is the complex nature surrounding three culturally partisan latent variables of "rights," "bear," and "arms." As an exercise, students are encouraged to try to come up with two variables for each construct in the propositional statement, define each variable with two operationalized measures, and discuss contextual factors and confounders. Students are also encouraged to draw a conceptual model of this propositional statement using the modeling techniques discussed earlier. After this exercise, students will be able to understand the complex nature and difficulty in not only drawing conceptual models, but also operationalizing and defining them.

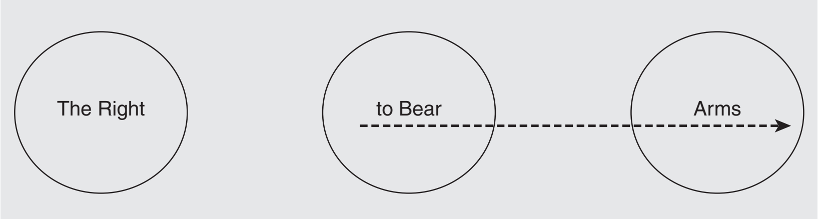

Figure 2-4 Propositional Statement of the Right to Bear Arms.

Although difficult to model and often resulting in different interpretive outcomes, several research articles reviewing healthcare delivery and leadership have utilized the proposition methodology to investigate construct relationships over the years.[8] Recent studies in manager competencies, critical thinking, and quality outcome assessment have also successfully used the proposition methodology to review phenomenon. Although sometimes referred to as concept mapping within the literature, the techniques, and methodologies are similar.[9] Regardless of name, the strength of utilizing the propositional technique is that it assists in generating propositional statements that can be used to guide the development of new variables to help define complex issues.[10]

Hypothesis

A hypothesis is a testable relationship between two variables. Furthermore, the purpose of hypothesis testing is to discover causal relationships between variables. Hypothesis statements are the foundation for all organizational research and form the basis for the advancement of knowledge. When writing a hypothesis, the researcher needs to follow very strict rules of design. From a reductionist point of view, in comparing two variables in a hypothetical relationship, there are generally five common methodologies for analysis.

1. One assumption is that there is no difference between variable 1 and variable 2 (null hypothesis).
2. The second assumption is that as one variable increases the other remains the same (positive relationship).
3. The third assumption is that as one variable decreases the other remains the same (negative relationship),
4. The fourth and fifth assumptions suggest that both variables will increase or both variables will decrease.

There may be some exceptions to these guidelines based on experimental design; however, these five hypothetical relationships form the basis for all hypothesis testing.

As an example, a classic hypothetical relationship may seek to discover the relationship between weight and blood pressure. One potential testable hypothesis may suggest that as weight increases, blood pressure increases. In this instance, weight may be classified as a continuous operationalized measure in pounds (1 to *n*), while blood pressure may be similarly classified as a continuous measure of systolic and diastolic indicators (again 1 to *n*). The same relationship can be tested with dichotomous units, a simple yes or no for weight increase, and a similar yes or no for outcome of blood pressure (see Figure 2-5).

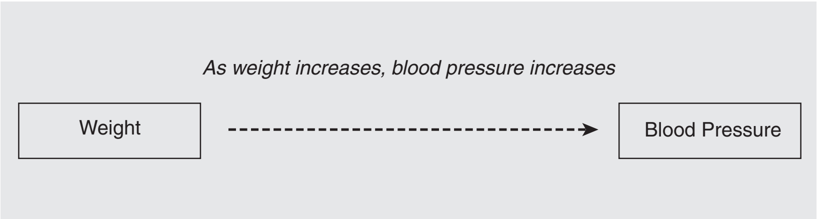

Figure 2-5 Hypothesis example.

In this example, it is first necessary to have a baseline for comparison and capture initial measures for both weight and blood pressure.

Baseline measures: Weight 185 pounds and blood pressure of 120/65
Measure after 6 months: Weight 205 pounds and blood pressure of 135/80

A simple visual inspection supports our initial hypothesis statement. If weight increased, but blood pressure remained the same, or decreased, we would fail to support our hypothesis.

It is incorrect to suggest that the hypothetical relationship is "proved" due to the fact that all hypothetical relationships are supported or not supported. It is incorrect parlance to suggest that a hypothesis is proved.

Hypothesis testing is often the way that the overall theory is falsified. Falsification is achieved through empirical testing of the various operationalized measures in theory. As a result, if a theory is not testable, the theory is not falsifiable in principle, and from an empirical viewpoint, is worthless to the field under study. For this reason, the falsifiability of theory is a necessary property of science. For a more detailed overview of designing and testing hypothetical relationships, encourage students to refer to their course text in research methods or quantitative analysis.

Research Questions

Building conceptual models supports the initial development of research questions. It is never a good idea to use opinions for guiding research questions; rather sound research questions should flow elegantly and easily from a given conceptual model. Similar to theory itself, positing research questions requires the understanding of certain rules and constraints in advance. For example, a research question supporting a conceptual model may include one or more of the following elements:

1. It must include the primary unit of analysis in the statement (i.e., organization, team, or individual).
2. It may include a reference to the environment, a construct, variable, or a contextual factor within the bounded rationality.

3. It may include the methodological tools used for measurement.
4. It must be a simple expression of one statement.

The following is an example of a good research question:

> *How do we measure the efficiency of hospitals with regression analysis?*

Note this research question has a unit of analysis (hospital), a primary construct (efficiency), and the tool to measure efficiency (regression analysis). Other details reference the research question can be addressed in other parts of the study.

Theoretical Application

Throughout this book, students will have the opportunity to learn about many different theories. Although not all the theories presented in this book lend themselves to easy conceptual modeling through the techniques discussed earlier in the chapter—all are capable of theoretical and conceptual modeling if careful study and analysis of the theory is performed. As a demonstration of the theoretical modeling principles, conceptually model Alderfer's theory of motivation.

In this instance, define motivation as the goal-directed behavior of individuals working in an organization. Alderfer's theory of motivation suggests that if an employer wants to motivate his or her employees that there are three distinct methodologies for doing this. Alderfer suggests that an employer should consider placing emphasis on three things: constructs of affiliation, power, or achievement. For the purpose of this conceptual model, we will only use the constructs of affiliation and achievement to demonstrate the utility of building the model. Remember that conceptual model building is as much an art as a science, so it is not always necessary to model all the parts of the theory.

The first step in the process is to completely define all the parts we are measuring and studying. Since we have already identified the theory, the second step is to identify our constructs. In our model (see Figure 2-6), we define affiliation as the types of opportunities employees have within the organization to join or participate in groups. In our suggested model, we define one group specifically as professional organizations. A professional organization may be something like the American Medical Association (AMA), American College of Healthcare Executives (ACHE), a professional honor society, or some other professional organization. We operationalize professional organizations through two measures of joining (operationalized as a dichotomous variable of yes or no), and advancing in that organization—perhaps to the standing of Fellow (yes or no).

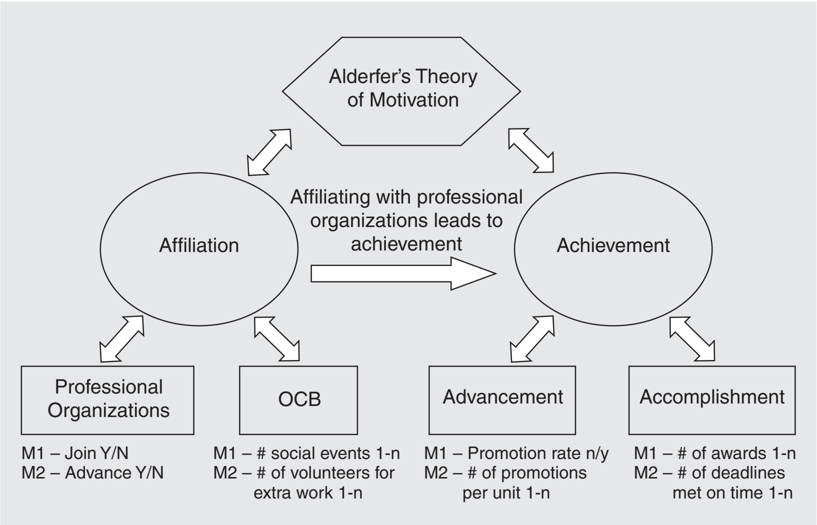

Figure 2-6 Alderfer's application of a conceptual model.

We may also suggest that the affiliation construct can be measured through the number of organization citizenship behaviors (OCB) within the organization. This might be measured by the number of social activities per month the employees in the organization engage in (measured by a continuous variable of 1 to *n*). We can also measure this construct by collecting data on how many people volunteer for extra work within the organization.

Apply the same methodology to the construct of achievement where this construct is measured by two variables of advancement and accomplishment. Define advancement as the promotion rate within the organization and the number of opportunities for advancement. Operationalize accomplishment by the number of awards an individual received and the total number of successful projects met on time.

A suggested propositional statement might be that affiliating with professional organizations leads to achievement. At face value, this propositional statement makes sense because it may be assumed that joining or advancing in a professional organization might make the employee more knowledgeable of job skills and, therefore, more likely to be promoted or become more efficient in his or her job. This may also be called face or construct validity.

As a test of one potential hypothesis, we could suggest the following:

> Hypothesis 1: Individuals who join professional organizations have higher promotion rates than individuals who do not join professional organizations.

Once data is collected on each measure, and outcomes are known, this hypothesis can be tested. In this way, the theory can be supported or unsupported by hypothesis testing.

Not represented in this conceptual model are our bounded rationality, possible confounders, and contextual factors. These elements are important to consider when building theoretical or conceptual models, although it is not always necessary to include all parts of the anatomy and physiology of theory in each model. Only the parts necessary to convey the intent of the model are required.

As a teaching tip, students should notice in the aforementioned model that "advancement" is used as a measure of the professional organization variable and as the variable itself for the achievement construct. Similarly, "accomplishment" is used as a variable in this model; however, in a different model accomplishment may be used as a construct. If a construct is defined based on empirical properties, then it can be used as a variable—and sometimes as a measure. It is always incumbent on the builder of the theory to remember that there is both an art and science to model building. The science captures the anatomy and physiology of theory and the rules and constraints therein. However, it is incumbent on the builder to recognize the opportunities and possibilities in applying those elements. As long as elements are carefully defined, and sound research methodologies are used based on literature, the building of conceptual models becomes easy with practice.

■ CHAPTER SUMMARY

This chapter discussed what a theory is, the anatomy and physiology of theory, and provided a short application of model building technique as it applies to Alderfer's theory of motivation. The anatomy of theory includes constructs, variables, measures, confounders, and contextual factors within a bounded rationality. The physiology of theory includes the relationships between constructs called propositions, and the relationships between variables called hypotheses. When properly modeled and operationalized, an aptly built model of theory is essential in falsifying, supporting, and testing the theory.

Review/Discussion Questions

1. How can conceptual model building be used to explain the difficulty in understanding propositional phrases like *the right to bear arms.*?
2. Why is the understanding of confounders necessary in the development of conceptual models?
3. What is the difference between theory and a conceptual model?

4. What are the key differences between the anatomy of theory and the physiology of theory?
5. Why is it possible for a term to be used as a construct, variable, or measure? What must the builder consider before using the selected term?

Learning Activities

Exercise 1

1. Using the theoretical and conceptual modeling techniques you have learned, develop two variables and two measures for the latent variables. See Figure 2-7.

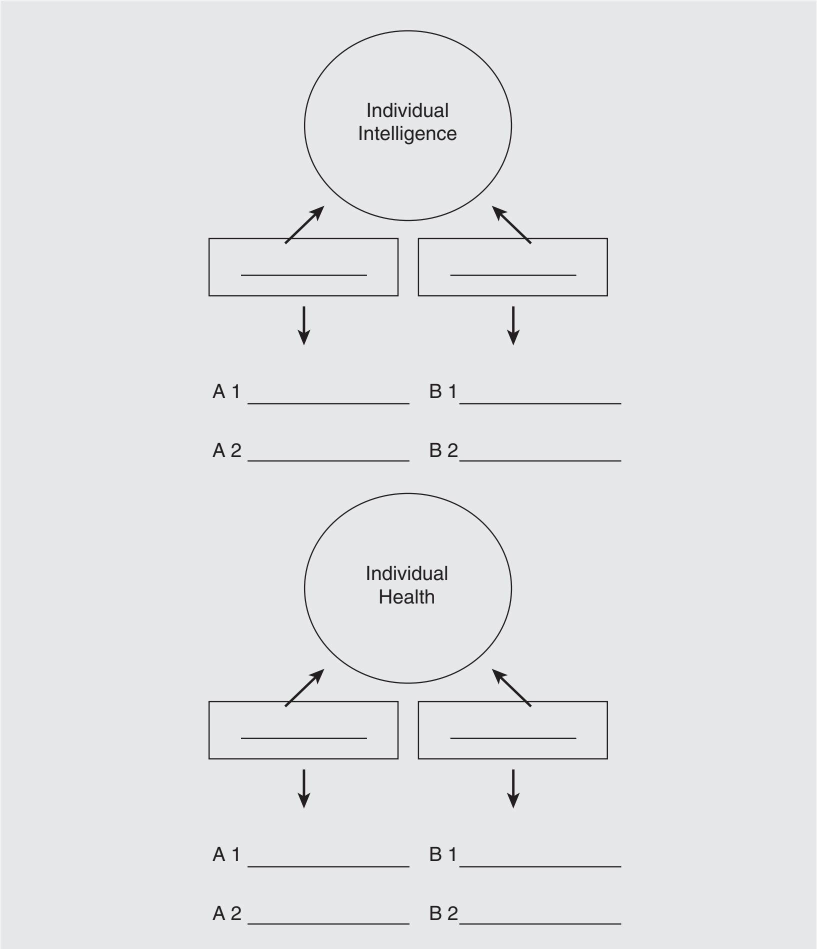

Figure 2-7 Chapter Exercise 1.

Exercise 2

1. Model the theory of motivation using two constructs, four variables, and eight measures. See Figure 2-8.
2. Use your measures to write two hypotheses relating to your theory.
3. Posit a proposition between your two constructs.

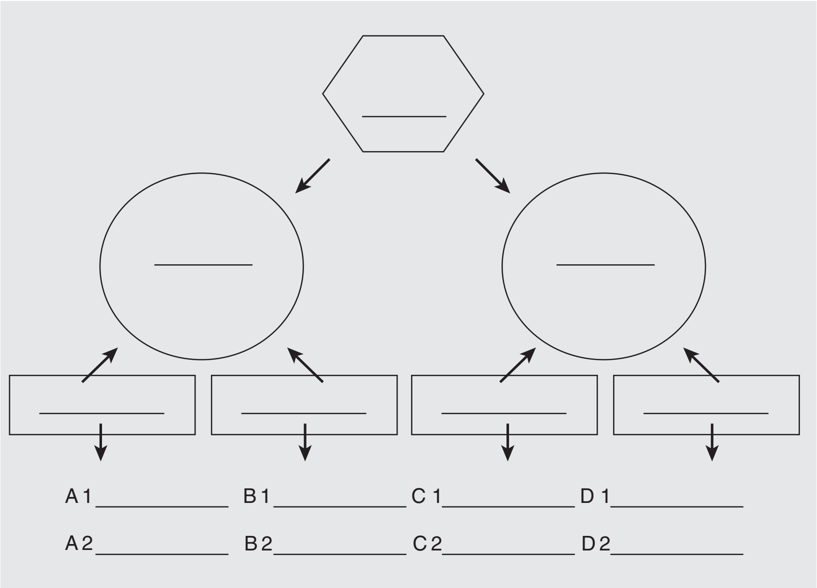

Figure 2-8 Chapter Exercise 2.

A. Hypothesis 1
B. Hypothesis 2
C. Proposition
D. Question: Where might you get data for these hypotheses?

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