

The Vocabulary of Research

4

What You Should Know!

The process of conducting and understanding research may seem to some like a foreign language. There are words, formulas, and so forth that may have more than one meaning or application. For example, the term *research* is often used in more than one context. It is quite common for students and teachers alike to use this term to describe a paper assignment that is actually a summary of existing literature. In contrast, the term *research* as used in this textbook refers to the process of conducting a scientific investigation of a specific phenomenon. Conducting research comes with a vocabulary that one must understand before one can proceed with the process of research. After completing this chapter, the reader should be able to:

1. Define theory and explain to the role that theory plays in research.
2. Describe the conceptualization process.
3. Describe what takes place during operationalization.
4. Define the terms variable, dependent variable, and independent variable.
5. Describe what a hypothesis is and how it differs from an assumption.
6. Present and discuss the types of hypotheses, including research, null, and rival.
7. Identify a population and discuss how it is related to a sample.
8. Define validity and reliability. Explain how these concepts are related.
9. Describe qualitative and quantitative research.
10. Discuss the steps in the research process, including theory, hypotheses, observations, and empirical generalizations.

The Language of Research

It is quite common for students and teachers alike to use the term *research* to describe a paper assignment that is actually a literature review. With respect to criminal justice and criminology, there is more to research than reviewing literature. The multiple uses of the term *research* is just one example of the need to understand the vocabulary associated with research methods. In Chapter 1, the term *research* was defined. In this chapter, terms associated with research methods, such as *theory*, *hypothesis*, and *variable*, are defined and expanded.

The process of developing research can appear to be complicated with a lot of moving parts. However, the basics are simple and can be visualized in the form of a circle with four main parts: (1) theory, (2) hypotheses, (3) observations, and (4) empirical generalizations (Healy, 2013). Healy (2013) referred to this circle as the "Wheel of Science." Explanatory research typically begins with theory and then moves through the remaining four parts.

Theory

Theory is a statement or groups of statements that attempt to explain, predict, or understand a phenomena. An interesting debate could arise regarding the role of theory in research, reminiscent of the age-old argument: Which came first, the chicken or the egg? With respect to theory, one side of the debate argues that theories drive the research (theory-then-research), with a basis in deductive logic. Research that is based on deductive logic begins with a theory. From the theory, hypotheses are developed and observations are collected to test the hypotheses. Empirical generalizations are developed from the results of the hypothesis testing and either support or do not support the theoretical basis. Keep in mind that results that do not support the theory do not necessarily indicate that the theory is wrong. The value of a theory is often determined based on many tests of hypotheses based on the theory over years or even decades and not based on a single research study.

The other side of the debate argues that research creates the theory (research-then-theory), with a basis in inductive logic. Research that is based on inductive logic begins with observations from which empirical generalizations are developed that are used to create theory or theories to explain the observations (Adler & Clark, 2007; Bryman, 2008; Colton & Covert, 2007; Creswell, 2008; Healy, 2013). Deductive logic and inductive logic are both based on the Wheel of Science but with different starting points. Theory is the starting point for deductive logic, and observation is the starting point for inductive logic.

A theory is essentially a statement that attempts to make sense of reality. Reality consists of those phenomena that one can identify, recognize, and observe. For example, criminal behavior is observed. Therefore, people breaking the law are a reality. A question that arises from this reality is what

Box 4-1**Examples of Theories in Criminology****Biological**

A person's physique is correlated to the type of crime one commits.

Criminality is genetic.

A chemical imbalance in one's brain can lead to criminal behavior.

Psychological

Criminal behavior is the result of an inadequately developed ego.

Inadequate moral development during childhood leads to criminal behavior.

Criminals learn their behavior by modeling their behavior after other criminals.

Sociological

Socializing with criminals produces criminal behavior.

Society's labeling of an individual as deviant or criminal breeds criminality.

Failure to reach societal goals through acceptable means leads to criminality.

people to break the law? It is here that theory becomes useful because it can explain an aspect of reality in general rather than just for individuals. Many criminological theories focus on causes of criminal behavior that include biological, psychological, and sociological factors. For examples of theories in criminology, see Box 4-1.

Whether theories have any merit or are truly applicable is why research is necessary. Proving that a theory is valid is a common goal of criminological and criminal justice researchers. However, to research a theory, the first step is to narrow the focus onto a concept. A single research study will not be able to examine all aspects of all crimes; therefore, researchers must narrow their attention to study a focus that is manageable.

Conceptualization

A *concept* is best defined as an abstract label that represents an aspect of reality, such as an object, policy, issue, problem, or phenomena. Every discipline has its own concepts. In criminal justice and criminology, some concepts include crime, law, criminals, rehabilitation, and punishment. For example, criminals are individuals who have violated a law and may be punished within the criminal justice system. Punishments are the actions taken against someone who has violated a rule or law.

Concepts are viewed as the beginning point for all research endeavors and are often broad in nature. They provide the basis for theories and serve as a means to communicate, introduce, classify, and build thoughts and ideas. To conduct research, the concept must first be taken from its conceptual or theoretical level to an observational level. In other words, a concept must go from the abstract to the concrete before research can occur. This process is often

referred to as *conceptualization*. In most research, it is seldom specified just how the concept is moved from the conceptual level to the observational level. This lack of clarity can cause readers to have problems in understanding what is being researched and why. Therefore, it is often helpful when the researcher can offer readers a clearer picture of the conceptualization process. Operationalization occurs after the conceptualization process.

Operationalization

Operationalizing involves the act of describing of how a concept is measured. This process is best described as the conversion of the abstract idea or notion into a measurable item. Operationalization is the taking of something that is conceptual and making it observable, or going from abstract to concrete. A single concept can be operationalized into multiple measurable items. For example, continuing with the criminal example from the conceptualization section, the concept of criminal could be operationalized into a measurable item that describes the type of crime committed by the offender (e.g., property, violent, other) or the number of crimes committed. The concept of punishment could be operationalized into a measurable item that describes the type of sentence (incarceration, community supervision, or other) or the length of the sentence (e.g., 6 months, 2 years, life without the possibility of parole).

Operationalization is one of the more important tasks before conducting any research. There is no one right way to approach this task. How this process is accomplished is up to the researcher. Yet, it is common for researchers to publish their results without ever explaining how their concepts were operationalized. This shortcoming has made it difficult for many students to comprehend fully the notions of conceptualizing and operationalizing variables. Therefore, when research is conducted that focuses on these two terms, it can be quite useful.

FROM THE REAL WORLD

Seldom do researchers report on their conceptualization process. However, when they do, it provides a better understanding of the research. From the following excerpt, can you determine the important concepts within the study?

Community empowerment is a concept used to describe individuals living in close proximity who as a group unite to combat a common problem. The focus of the group is the common problem. If a community is to be empowered, the residents must first be aware that a problem exists (community awareness) to such an extent that it is disturbing or troubling (community concern), resulting in organization of the community (community mobilization) to fight against it (community action). (Moriarty, 1999, p. 17)

The following excerpt shows how a concept is operationalized. Community awareness was conceptualized as the level of knowledge about the use of alcohol and other drugs in the community. Four variables reflected community awareness: (1) drug usage in the neighborhood; (2) drug dealing in the neighborhood; (3) alcohol and drug prevention messages; and (4) availability of certain drugs (eight different drugs in all). The following are the actual questions used to establish each variable (Moriarty, 1999, p. 18):

- *Drug usage in the neighborhood:* Respondents were asked, "How many people in this neighborhood use drugs?" Responses included "many, some, not many or no residents use drugs."
- *Drug dealing in the neighborhood:* Respondents were asked, "How often do you see drug dealing in this neighborhood?" The responses included "very often, sometimes, rarely, never."
- *Alcohol/drug prevention message:* Respondents were asked if they had heard or seen any drug or alcohol prevention messages in the past six months.
- *Availability of certain drugs:* Respondents were asked about the difficulty or ease of obtaining specific drugs in the county. The list of drugs included marijuana, crack cocaine, other forms of cocaine, heroin, other narcotics (methadone, opium, codeine, and paregoric), tranquilizers, barbiturates, amphetamines, and LSD. Each drug availability represents one variable.

Variables

The primary focus of the operationalization process is the creation of measurable items known as *variables* and subsequently developing a measurement instrument to assess those variables. Variables are concepts that may be divided into two or more categories or groupings of "attributes" or characteristics. For example, *male* and *female* are attributes of the variable *gender*. The primary purposes of developing these variables are to measure a phenomenon and also to examine the relationship between two or more variables in explanatory research. When examining the relationship between variables, there are two types of variables involved: dependent and independent.

Dependent Variables

A dependent variable is a factor that requires other factors to cause or influence change in it. The dependent variable is the outcome factor or the factor that is being predicted. If a researcher is studying the impact of parental supervision on juvenile delinquency, then juvenile delinquency is the dependent variable. It is the dependent variable because changes in juvenile delinquency are being caused by changes in parental supervision.

Independent Variables

The independent variable is the influential or the predictor factor. In other words, these variables are predicted to cause the change or outcome of the dependent variable. Often used independent variables in the study of criminal behavior are demographic characteristics, such as age, gender, race, marital status, and education. When determining independent variables, it is important to keep in mind time order. Independent variables must come before dependent variables.

Identifying and recognizing the difference between the variables is important in research, but sometimes the details may get lost due to the amount of information within any one study. Therefore, when research specifically calls attention to the variables, it can be quite useful. Keep in mind that whether a variable is dependent or independent is defined by the researcher and not by the variable itself. Criminal behavior could be a dependent variable if the researcher is studying the impact of unemployment on theft behavior. On the other hand, criminal behavior could be an independent variable if the researcher is studying the impact of criminal behavior on the stability of marriage. The key to any research is to be able to operationalize the concepts into understandable and measurable variables. Failing to complete this task makes the creation and testing of the hypotheses more difficult.

Hypotheses

Once the concept has been operationalized into variables based on the theoretical basis, then most research focuses on testing the stated hypotheses. A *hypothesis* is a specific statement describing the expected relationship between the independent and dependent variables. There are three common types of hypotheses: (1) research, (2) null, and (3) rival.

Research Hypothesis

The foundation of a research project is the research hypothesis. This hypothesis is a statement of the expected relationship between the dependent and independent variables. The statement may be specified as either a positive or negative relationship. In a positive relationship, the dependent and independent variables are moving in the same directions. They are increasing, or they are both decreasing. In a negative relationship, the dependent and independent variables are moving in opposite directions. If the independent variable is increasing, then the dependent variable is decreasing. Or, if the independent variable is decreasing, then the dependent variable is increasing. The example of juvenile delinquency provides an example of a negative relationship, specifically an increase in parental supervision is predicted to decrease juvenile delinquency. This result may be expected because juveniles who are under increased supervision will have fewer opportunities to participate in delinquency.

Null Hypothesis

Some researchers argue that the results of the research should support the research hypothesis, including the existence of a relationship as well as the direction of the relationship between the dependent and independent variables. Others claim that the primary goal is to disprove the null hypothesis, which is a statement indicating that no relationship exists between the dependent and independent variables. Therefore, a null hypothesis may be that parental supervision does not impact juvenile delinquency. By rejecting the null hypotheses, the research goal has been fulfilled.

Rival Hypothesis

Before starting the research it is customary to establish the research hypothesis, which are generally the results the researcher expects to find based on the theoretical basis. However, sometimes the results may reject both the null hypothesis and the research hypothesis. This situation allows for the creation of what is called a *rival hypothesis*. The rival hypothesis is a statement offering an alternate prediction for the research findings. Continuing with the example of parental supervision and juvenile delinquency, the rival hypothesis would be that as parental supervision increases, so does juvenile delinquency. This unexpected result may occur because juveniles who are under increased supervision may rebel and act out due to the stress of being constantly under supervision.

It is usually the goal of the research to be able to reject the null hypothesis. Testing the research hypothesis becomes central to the research, making identifying the hypothesis an important aspect of the research. Yet, although hypotheses often take center stage in research, there is another type of statement that can find its way into the research: assumptions. However, these types of statements should be avoided whenever possible.

Assumptions

Hypotheses are educated guesses about the relationship between variables and must be proven by the research results. In contrast, an assumption is a

FROM THE REAL WORLD

In examining the effect of participatory management on internal stress, overall job satisfaction, and turnover intention among federal probation officers, Lee, Joo, and Johnson (2009) offered three hypotheses: (1) organizational variables are more important than individual variables in predicting an officer's turnover intention; (2) among organizational variables, participatory climate, internal stress, and overall job satisfaction, respectively, have a significant direct effect on an officer's turnover intention; and (3) participatory climate and internal stress also have a significant indirect effect on an officer's turnover intention.

statement accepted as true with little supporting evidence. From a research perspective, assumptions are problematic. It is expected that with statements of inquiry or fact that there be substantiating research. It seems generally inconsistent in scientific research to have assumptions (Banyard & Grayson, 2009; Creswell, 2008).

Assumptions can be defined as statements one accepts as being true with little or no supporting evidence, a stance inappropriate to scientific research (Gillham, 2009). However, it is difficult to conceptualize a piece of research without having some assumptions about the topic of the study. Some assumptions may be needed in the development of a working hypothesis or hypotheses to help guide thought about the topic of interest, and to help shape the design of the study. It is good research practice to identify and acknowledge any *a priori* assumptions of which the researcher is aware while the research study is in the planning stages.

However, assumptions can often lead to research. For example, because of the believed natural caring instincts of women, an assumption might be made that women would make better police officers than men. Because there is little evidence to validate this assumption, and it is not a readily accepted statement, at least among men, there is a need to research this assumption. In this situation, the researcher could move beyond the untestable assumption that women would be better officers because they are more caring by converting the assumption into hypotheses that can be tested. Variables could be created to measure what is meant by caring and what is meant by officer performance.

Theory, concept, operationalize, variable, hypothesis, and assumption are all key words in the language of research. Still, they are just the building blocks for other words with which one should be familiar.

Other Necessary Terms

There are many other terms a student should be familiar with before undertaking a research effort. Because these remaining terms are covered in greater detail in later chapters, only a brief definition is offered here.

Unit of Analysis

A unit of analysis is the level at which the researcher will focus his or her attention. It could be individuals, groups, or social artifacts depending on the nature of the research. If the proposed study is examining the influences of individual criminal behavior, then the level of analysis is the individual. However, if the proposed study is crime rates, then the unit of analysis would be the social artifacts, specifically crime reports at the state, county, or local levels.

Population

A population is the complete group or class from which information is to be gathered. For example, if a researcher

then all Atlanta police officers would be the population. Although it would be great if every member of a population could provide the information sought, it is usually logistically impractical in that it is both inefficient and wasteful of the researcher's time and resources. Therefore, most researchers choose to obtain a sample from the targeted population.

Sample

A sample is a smaller subset chosen from within a target population to provide the information sought. Choosing this group is referred to as *sampling* and may take one of several forms, including probability and nonprobability sampling. Sampling is important enough to warrant an entire chapter of its own later in the text. Some examples of sampling are:

Random: A random sample is one in which all members of a given population had the same chances of being selected. Furthermore, the selection of each member must be independent from the selection of any other members.

Stratified Random: This sample is one that has been chosen from a population that has been divided into subgroups called *strata*. The sample is comprised of members representing each stratum.

Cluster: Cluster refers to a multistage sample in which groups are randomly selected and then individuals within the groups are randomly selected.

Snowball: This sample begins with a person or persons who provide names of other persons for the sample who in turn provide the names of additional persons.

Purposive: Individuals are chosen based on the researcher's belief that they will provide the necessary information.

Once the sample has been identified, the information is collected. The various collection techniques are covered in detail in a later chapter. In collecting this information two concerns for the researcher are the validity and the reliability of the data collection device.

Validity

Validity is a term describing whether the measure used accurately represents the concept it is meant to measure. There are four types of validity: (1) face, (2) content, (3) construct, and (4) criterion.

Face validity is the simplest form of validity and refers to whether the measuring device appears, on its face, to measure what the researcher wants to measure. Using a ruler to measure time would appear odd and not useful; however, using a ruler to measure distance appears to be valid. Face validity is primarily a judgmental decision. It is the most used form of validity, perhaps due to its simplicity. In content validity, a measuring device is examined to determine how well it covers the concept in question; specifically each element is examined within the measuring device. Only using income to measure

socioeconomic status is missing important elements, such as education and occupation measures; thus it is incomplete and lacks content validity. Construct validity refers to the fit between theoretical and operational definitions of the concept as well as the level of expected agreement between the measure and other variables. For example, a positive relationship might be expected between fear of crime and the likelihood of protective behaviors, such as not walking alone at night. Criterion validity represents the degree to which the measure relates to an external criterion. It can either be concurrent (comparing self-reports of property crime victimization to property crime reports) or predictive (the ability to accurately foretell future events or conditions, such as use of the Scholastic Aptitude Test (SAT) to predict performance in college).

Reliability

Reliability refers to how consistent the measuring device would be over time. If the study is replicated, will the measuring device provide consistent results? The two key components of reliability are stability and consistency. *Stability* means the ability to retain accuracy and resist change. *Consistency* is the ability to yield similar results when replicated. Keep in mind that a measure can be reliable but not valid. Each year as daylight savings time begins, many people will forget to reset their clocks. If for the next week, an individual does not reset his clock, it will sound consistently when it reads 7:00 a.m.; however, it will in actuality be 8:00 a.m. (you may be able to use this as an excuse for being late for work once, but beyond that would be pushing your luck).

Data

Having established the validity and reliability of the measuring device, the sample can now be approached for information. The information gathered is known as *data*. Data are simply pieces of information gathered from the sample that describe events, beliefs, characteristics, people, or other phenomena. These data may be qualitative or quantitative.

Qualitative Versus Quantitative Research

The debate over qualitative versus quantitative research simply comes down to a question of concepts as ideas or terms versus numerical values. Broadening this distinction in easy terms offers quantitative research that refers to counting and measuring items associated with the phenomena in question, whereas qualitative research focuses on concepts and verbal descriptions (Given, 2008). In recent years there has been a trend among scholarly journals to demand more quantitative than qualitative research. This preference is because qualitative research is often criticized as not being "scientific" (Bergman, 2009; Creswell, 2008; Given, 2008). Both methods are appropriate and necessary to criminal

justice and criminological research. However, either qualitative or quantitative research may be preferred depending on the goal or purpose of the research.

Qualitative Research Defined

Qualitative research is defined as a nonnumerical explanation of one's examination and interpretation of observations with the goal of identify meanings and patterns of relationships (Creswell, 2008; Hagan, 2006; Maxfield & Babbie, 2009). This type of research encompasses interpreting action or meanings through a researcher's own words (Adler & Clark, 2007) rather than through numerical assignments. For example, saying someone is aggressive and confrontational is a qualitative observation, but saying that someone has been arrested five times for disorderly conduct is a quantitative observation. Such analysis enables researchers to verbalize insights that quantifying of data does not permit. Continuing with this example, the qualitative observation could be expanded to include specific details related to the aggressive and confrontational behavior, such as alcohol or drug consumption prior to the incidents. It also allows one to avoid the trap of false precision, which frequently occurs when subjective numerical assignments are made. If the disorderly conduct offender were assessed by a counselor using an assessment device that included the item "How aggressive is the arrestee on a scale of one to five with one being the least aggressive and five being the most aggressive," this example would be quantitative but is subjective based on the judgment of an individual. These quantifications are misleading in that they convey the impression of precision that does not really exist.

Merits and Limitations of Qualitative Research

The insights gained from qualitative research and their usefulness in designing specific questions and analyses for individuals and groups make this form of research invaluable in the study of criminal justice and criminology. However, the costs and time involved in such studies may not be logistically feasible (Bergman, 2009; Drake & Jonson-Reid, 2008). One of the major complaints about qualitative research is that it takes too long to complete. Other complaints about qualitative research include that it requires clearer goals and cannot be statistically analyzed (Creswell, 2008; Given, 2008; Maxfield & Babbie, 2009). There may also be problems with reliability in that replication may prove quite difficult. Lastly, validity issues may arise from the inability to quantify the data.

Quantitative Research

Unlike qualitative research, the definition of which has been controversial and often inconsistent, definitions of quantitative research are quite consistent: It provides a means of describing and explaining a phenomenon through a

numerical system (Berg, 2008; Fowler, 2009; Maxfield & Babbie, 2009). In other words, quantitative research is not based on a possibly subjective interpretation of the observations but is a more objective analysis based on the numerical findings produced from observations. One could look at data often collected by correctional agencies as an example of quantitative research, such as the length of prison sentences (often measured in months or years), the number of prior convictions, or the number of days offenders stay out of trouble upon release. Keep in mind that subjectiveness can be interjected into quantitative analysis, as in the previous example of the counselor using his or her judgment with an assessment device.

Because of the potential for bias and the criticisms of qualitative research as being unscientific, most criminal justice and criminological research tends to be quantitative in nature. A quick review of the leading journals that publish criminal justice and criminology research supports this assertion. There are many issues that are not suitable for numerical assignments; to apply quantitative measurements would be inaccurate and misleading. Some of the more intense theoretical debates, such as the merits of the death penalty, are based on personal beliefs about human nature that are shaped by deep-seated religious, political, and moral convictions. As a result, perceptions of these tend frequently to be more influenced by emotion and ideology than by scientific study. This reasoning does not mean that quantitative research cannot be conducted, only that it is difficult to do so.

The Research Process

Having been introduced to research and its language, you can now see how the described process fits into the Wheel of Science model. This process begins with a theory, usually identifying some concept. The concept is then conceptualized and operationalized creating variables, including dependent and independent variables. Completing the identification of both the independent and dependent variables leads to developing the hypothesis. Finally, a sample is chosen, information (data) is gathered from the sample, the information is converted into the proper data for analysis, and the results are reported. This process becomes functionally clearer as the text progresses.

What You Have Not Done Before

Developing researchers may believe that they have done qualitative research through the literature reviews and comparative and historical research done for previous courses. If done in a systematic and logical manner consistent with the scientific method, perhaps this is true. But have numerical values been assigned, data collected using that assignment, and the results analyzed? It is doubtful.

Unless one has a strong background in math and science or has been fortunate enough to have been involved in an empirical research project (for those who are still struggling with methods phobia, fortunate is defined here as having benefited from the knowledge and insights of the experience rather than from the pleasure of the experience). This deficiency is one that the authors hope to aid in correcting. A college graduate who values and is capable of critical thinking and independent learning needs to be able to conduct quantitative research. It will prove valuable not only in an academic career but in future work tasks or civic duties. It is surprising to find how many things there are in life that warrant "looking into." In addition, quantitative research is actually easier than qualitative research.

Summary

Becoming proficient in research requires knowing the language. Several terms have been introduced that are important to mastering research as a language. The main terms include theory, concept, conceptualization, operationalization, variables, hypothesis, and sample. There are two types of variables: independent and dependent. A sample is a subset of the selected population. Other terms are validity (face, content, construct, and criterion), reliability, and data. With knowledge of these terms, the research process can be taken to another level.

APPLICATION EXERCISES

1. Due to the recession of 2007–2009, many municipalities increased their cost-cutting measures. One city not only turned off a percentage of streetlights but actually removed the streetlights themselves. You have been approached by concerned neighborhood associations and business associations to study the impact of removing the streetlights on the occurrence of crime, fear of crime, and businesses within the affected communities. The first step is to conceptualize the study terms (crime, fear of crime, and business growth) by determining the abstract concept for each term. Keep in mind that you may conceptualize these concepts differently from your classmates.
2. After completing the conceptualization step, you will need to operationalize the concepts crime, fear of crime, and business growth by developing at least one variable for each concept. An example using the concept of the change in the number of streetlights would be a variable that counts the increase or decrease in the number of streetlights within a defined period during the previous one-year period. Thus, a defined area in which two streetlights were added would be +2 and a defined area in which two streetlights were removed would be -2.

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3. Based on the variables you created during operationalization, what type of data