

## Why Fret Over Measurement?

This chapter will help you determine how to measure each variable in your study. To accomplish this objective, the chapter will include a great number of concepts and checklists to ensure that your measurement is optimal. It will also focus on objectivity as a core principle, and it will encourage you to heighten the accuracy of the method you employ to measure variables.

For example, if you wanted to understand the level of the effectiveness of your alcoholism treatment program, you could ask the social workers working in this program to give their opinions about whether it is effective in reducing the problems associated with alcoholism. The social workers could either respond to a questionnaire in which they answer YES or NO when asked if the program is effective, or they could rate the program on a scale of 1 to 4: (1) highly effective, (2) mostly effective, (3) somewhat effective, or (4) not effective.

However, this method would be highly vulnerable to subjectivity. The social workers who serve in this program would be expected to have a positive bias as t. They do not want to engage in behaviors likely to lead to the elimination of a program that provides their jobs.

Instead of asking the social workers, Why not just ask the clients to answer a very broad question, like the above examples? This would be a step in the right direction because the clients are not protecting their jobs by being positive. However, this broad characterization of effectiveness would be vulnerable to the social desirability bias whereby people are encouraged to give a socially desirable response. And, of course, most of us have been encouraged throughout our lives to be positive.

If clients are asked about effectiveness, the nature of their responses should be broken down into categories of life where they are more likely to have differentiated responses, and thereby be more objective and truthful. For example, clients they could be asked about their interpersonal lives, their work lives, their home lives, and so forth. More specifically, they could be asked a series of questions designed to measure the extent to which they are depressed, or suffering from the symptoms of post-traumatic stress disorder.

We could ask clients to give a statement about how well the ~~service-treatment program~~ has helped them. This could be very useful, especially in the improvement of services. However, when the agency is dealing with people who represent the source of their funding, a set of statements would not be as convenient as concrete data on for example, the client's scores on depression ~~when the agency is dealing with people who represent the source of their funding~~.

So, effective measurement helps up to get an objective picture of our research theme and avoid measuring a person's bias. ~~We do not want to measure a person's bias~~. Also, it helps us to achieve credibility with others in the reporting of our results. If we reveal objective data, we are more likely to be heard.

### **The Nature of Measurement in Social Work Research**

Sometimes the social worker will have an easy measure of the study variable. This could include grades in school, the number of times a client fails to show up for an appointment, or whether a homeless person found a home. These researchers are lucky—they have a measure of outcome that has-gives little reason for concern.

But what if you need to measure something less concrete, like self-esteem, or caregiver burden, or perceptions of social support? Now you have a challenge. You will need to define your variable carefully and seek a published tool for its measurement. If you cannot find one, you will need to construct one yourself.

In previous chapters, you have witnessed the measurement of quite a few variables which were defined before they were measured. These variables included (1) whether a person had experienced recent minor illnesses, (2) whether a person regularly engaged in aerobic exercise, (3) the traits that describe the good work manager, (4) sex-role stereotype about the characteristics of the good manager, (5) stressors, (6) stress, (7) social support, and (8) depression. Therefore, you have had some experience with measurement. Now it is time for you seek more depth of understanding about this aspect of research.

In measurement, your critical issue is accuracy. Readers of your study results about marital satisfaction might have problems with your findings if your measure of marital satisfaction contained no items on extended family relationships. They may believe that your measurement tool failed to be adequately comprehensive. ~~Another example of inaccurate measurement could also be a result of a tool that is difficult to understand; would be the situation where your tool is difficult to understand.~~ If your ~~subject~~ subject ~~does~~ does not know what a question means, ~~you are he or she is~~ you are he or she is not going to answer the question accurately. Measurement accuracy will be discussed in this chapter by an examination both of reliability and validity, two means of reducing measurement error.

You have already seen the definitions of reliability (consistency) and validity (accuracy) in previous chapters. Your foray into this subject started with the word *credibility*, ~~which because it~~ is used in everyday language and represents a general category into which both reliability and validity ~~fall~~ exists. Are your tools credible to the readers s of your research report? If not, they will lack confidence in your results.

In a previous chapter, you saw descriptions of three levels of measurement—nominal, ordinal, and interval. ~~First, if~~ First, if your measure of a variable places study subjects into categories that have no order, you will have a nominal variable. Examples include ~~nominal variables include category of diagnosis and gender and category of diagnosis. Males—males~~ nominal variables include category of diagnosis and gender ~~and category of diagnosis. Males—males~~ are neither higher nor lower than females. ~~Secondly,~~ Secondly, ~~if~~ if your measure of a variable puts people into categories that have an order, you have a variable measured at the ordinal level. An example ~~of an ordinal level~~ of an ordinal level would be an opinion statement with the response categories of strongly agree, agree, disagree, and strongly disagree. In this situation, there is an order among the ~~categories possible responses~~ categories possible responses. ~~Lastly, if~~ Lastly, if you have measured your variable at the interval level, you have given them a score on a scale or ~~you have~~ you have some other measure that is numerical in nature, such as age measured in years (not categories of years).

These levels of measurement form a hierarchy. Nominal measurement is the lowest level, followed by ordinal, which is followed by interval. There is a fourth level of measurement: ratio. This level has not been given attention in this book because it has less importance for the social work researcher than ~~does~~ does the other levels of measurement. You need to ~~start with identifying know~~ start with identifying know the level of measurement of your variables when you seek a statistical test for its examination.

## Standardized Tools and Individualized Tools

Some measurement tools are standardized and some are individualized. A standardized scale has a designated set of sentences and words that are used in the same way for each person who completes them. Examples include the Beck Depression Inventory and the Hare Self-esteem Scale.

~~This is the form you are most~~ likely to see standardized tools used in published studies than individualized tools. You will see this form in examples of scales that are used in this chapter. The words on these scales are the same for each person who completes it.

~~However, there are times when you cannot find a standardized scale that measures what you want. This is when you seek, or develop, an individualized scale. You will tailor the individualized scale for your individual client, so that client will have his or her own unique scale. This means you will have a scale that is unique for your client.~~ Some of the structure of your individualized scale may be common for more than one client, but the individual items for measurement are unique for each your client of them.

For example, you will see a discussion of the YES scale in a later section of this chapter. When you employ this scale, you will ask the client to describe, in his or her own words, the outcome objectives they want to achieve, and to rate how well things have been going in the past week regarding each objective. One client may have the objectives of “Not shouting at my husband when he comes home late,” while another might want to or “staying calm when I discuss my son’s school grades.”

While each client will have unique objectives, the general form of the YES scale is the same for all clients. Each scale will have a 10-point rating system with ~~a rating of 1 to~~ representing Miserably and ~~a rating of 10 to~~ representing Extremely well. You will ask your client to rate each objective on this 10-point scale each time you seek an evaluation. For the single client study, this may be done each week when you see the client for a treatment session.

## Measurement Error

When you attempt to use human subjects to measure concepts like anxiety, depression, and feelings of support, ~~and depression,~~ you should understand the concept of **measurement error**, which is the distance between the data you have and the truth about the concept you are trying to measure.

Some tools for measuring depression will have less measurement error than others because they have

been more carefully constructed and subjected to tests for reliability and validity. Measurement error tells you that your measurement tool is not perfect, but it does not have to be perfect. ~~Instead,~~ it simply has to be a credible way to measure your variable for your purposes. If you wish to publish your study results, you will pay ~~a lot of~~ careful attention to issues like reliability and validity. ~~However,~~ if your study is designed to help you with decisions about client service, you will still be attentive to whether your measurement is credible, but you may not feel the need to delve as deeply into the nuances of reliability and validity in the pursuit of perfection. Perhaps the pursuit of perfection is not cost-effective in this situation.

You have probably taken an exam in a class and been frustrated with your grade. Upon review of the items you answered incorrectly, you ~~have~~ likely saw ~~seen~~ questions that you miss-read, leading you to make an error on your test ~~even though.~~ ~~But~~ you knew the concept being measured by ~~this item on the test at question.~~ ~~What do we call this situation?~~ We can call ~~it~~ this situation an example of measurement error. You knew more than your grade for this item on the test indicated. ~~On the other hand,~~ if you were very lucky with guessing the correct answer to questions you did not understand, this would also be measurement error. In this situation, you would be the beneficiary of the ~~eat~~ error, rather than the victim. Both are measurement error because the grade for the test was not a perfect illustration of exactly what you knew about the subject of the exam.

If the amount of measurement error is not acceptable, you have a bad tool for measuring your concept. If there were many examples of error, we might call this a bad test. ~~it.~~ ~~In other words,~~ ~~this test~~ does not do a good job of measuring knowledge about the subject under study.

#### *Sources of Measurement Error*

A source of measurement error is known as the **social desirability bias**, which is a tendency to answer questions in accordance with what we believe is the socially desirable way, rather than what we really believe. ~~This is why~~ To avoid this bias, you would not start a questionnaire item with the words "Don't you believe that..." This phrase is suggesting what ~~you~~ the subject should believe.

The social desirability bias is an example of **systematic error** in measurement. Systematic error occurs when the tool we use reflects inaccurate information in a consistent fashion. If a tool is highly

vulnerable for soliciting a social desirability bias, we will find a consistent pattern of responses from research subjects that favors the socially desirable response to questions. The wording of questions for a survey can encourage a biased response, [as in the example above](#). ~~For this reason, i~~ information given later in this chapter on constructing a measurement tool will have information to help you to avoid this mistake.

Another type of measurement error is known as **random error**. This type of error has no consistent pattern, ~~as in~~ the case of systematic error. With ~~regard to the latter~~ [systematic error](#), you might predict that [your a study's](#) subjects will answer a given question in a given way because it is worded in a way that solicits a socially desirable response. ~~That would be systematic.~~ [Random](#) [With random error](#), however, ~~is not a type of error where~~ you can ~~not~~ predict the direction of the error. If, for example, you administered a questionnaire designed for adults to a group of third grade students, you would likely get [random errors](#); ~~error that is random.~~ ~~They de~~ [would](#) not understand the meaning of the questions, so they [would](#) just mark the tool in a random fashion.

#### *Preventing Measurement Error*

Among the [ways-methods](#) for preventing measurement error are (1) preparing instruments that have items that are well worded for the designated population, and (2) using more than one method of measuring the same thing. The example of a tool for adults given to children illustrates the first ~~mechanism~~ [method](#). ~~You can employ the second prevention method by~~ ~~The second method you can employ is~~ using personal interviews of study subjects to measure your variable and comparing this result to that of a measurement tool designed to measure the same concept. ~~Were the results consistent?~~ ~~If the two results are~~ [not consistent](#), you do not have evidence of validity.

Two mechanisms for preventing measurement error are tests of reliability and validity. **Reliability** refers to the consistency of a measurement device, ~~while~~ ~~V~~ **validity** refers to the accuracy of a measurement tool. A tool must be consistent in order to be accurate, but a [consistent](#) tool [might not necessarily be](#) ~~can be consistent without being~~ accurate. In other words, ~~it a~~ [tool](#) can be consistently inaccurate.