The threats to internal validity

When conducting research, a researcher must be familiar with the basic issues and concepts that are essential to comprehend the scientific study of behavior. According to Leedy and Ormrod (2010) a novice researcher must be knowledgeable about what research is really entailed because the word research has a certain mystique about it. Leedy and Ormrod further stated that a researcher needs to dispel the myths and misconceptions surround research before a valid research can be conducted. Leedy and Ormrod defined research as " a systematic process of collecting, analyzing and interpreting data in order to increase our understanding of a phenomenon about which we are interested or concerned" (2).

In the process of conducting research, a researcher will encounter repeatedly with two terms in research methodology such as reliability and validity which are often used in connection with measurement. Creswell (2009) emphasized that the validity and reliability of a researcher ' s measurement will underline the extent to which such researcher can learn something about the issue being investigated, the probability that a statistical significance will be obtained in the data analysis and the extent that meaningful inferences can be drawn from the data. In addition, both validity and reliability can reflect the degree to which a researcher may have error in the measurements. This paper aims to compare and contrast the characteristics of external, internal and construct validity and identify the threats to external, internal and construct validity.

What is validity?

Understanding the validity of information is imperative in this contemporary society where society is bombarded with information through the use of

internet search engines, such as Google, Yahoo, Bing and etc…Thus, society as a whole must make a decision to determine the extent to which the information is valid. The concept of validity in research is generally asking whether or not the information found is valid. Cosby and Bates (2012) defined validity of a measurement as the extent to which the instrument measures what is intended to measure. Overall, validity refers to the approximate truth of propositions, inferences, or conclusions. There are three key type of validity to include, Internal Validity, External Validity and Construct Validity.

Internal Validity

Internal validity refers to the ability of making inferences about causal relationships from the results of a study (Cosby & Bates, 2012). For example, if researchers propose that creating a 21st century policy to protect civil liberties will reduce the risk of having citizens' civil rights being violated, they want to ensure that they can articulate this theory with as much confidence as possible, and they must be confident in the knowledge that what they investigated, and not other factors, explains the results. Strong internal validity can be found in a study if one variable causes changes in the other variable. However, Cosby and Bates pointed out that three key elements such as temporal precedence, covariation and elimination of alternatives must be analyzed before determining if a strong internal validity exists in a study.

Furthermore, the level of interval validity can be impacted in a qualitative research designs by the type of research approach selected (experimental,

observational, or relationship-based research design) and other potential threats that can manipulate the results.

Threats to Internal Validity

Yu and Ohlund (2012) have underlined different factors than can jeopardize internal validity such as participation selection, participant attrition, experimental history, maturation, effects of testing, instrument decay, experimenter effects, demand characteristics, regression to the mean, diffusion of treatment, compensation rivalry and resentful demoralization. All these elements pose threats to the internal validity which is the most important property of any experiment. Therefore, a researcher must be aware of those factors and protect the integrity of internal validity because with low internal validity comes low power.

External Validity

Similar to internal validity, external validity plays an important role in research. In fact, Cosby and Bates identified external validity as simply related to generalizing. In other words, external validity concerns with the extent to which results can be generalized other settings or populations. For instance, can the results of a study hold for other persons in other places and at other times? When it comes to protecting citizens' civil rights can the results of the study hold in countries such as Pakistan, Egypt or even in Africa? The answer would be no since those countries are operated under a different government than the United States of America. In this presented instance, the critics may come along and claim that the theory is not supported since it is not applicable to those outside. As, a result, it is

imperative that a beginner researcher also be familiar with the threats to external validity.

Threats to External Validity

When conducting research, a threat to external validity simply means that an error has occurred while making a generalization and all threats work together with the independent variable. According to Leedy and Ormrod, the threats to external validity include aptitude, situation, pre-tests effects, post-tests effects, reactivity, and Rosenthal effects. Just like to internal validity, these threats can profoundly impact the intended results of the study. Thus, researchers must examine all angles before conducting a study, such as the method that will be used, ethical and practical considerations. Similar to external validity, construct validity is also related to generalizing but it involves generalizing from the measures or programs to the theory of the measures or program.

Construct Validity

Jackson (2008) described construct validity " as the degree to which conclusions can legitimately be made from the operationalizations in a study to the theoretical concepts on which those operationalizations were founded" (p. 267). The idea of construct validity is usually found in the section on measurement in the study and it is important to the integrity of the study. For instance, if researchers fail to define what they mean by the construct, critics can discredit the study and accused the researchers of doing a poor job. Just as internal and external validity, there are some common threats to construct validity.

Threats to construct validity

When researchers assert construct validity, they are practically emphasizing that the observed patterns which is the ways things are operated in reality is coincided with the chosen theoretical pattern that underlines how researchers think that the world functions (Cosby & Bates). Furthermore, in research, researchers are often criticized for the claims that they make because fail to use the appropriate research methods that could strengthen their claims. In comparison, to external validity, some threats are widespread to construct validity that can make the results of a study questionable, such as inadequate preoperational explication of constructs, experimenter expectancies, restricted generalizability across constructs, hypothesis guessing, evaluation apprehension, confounding constructs and levels of constructs, interaction of different treatments, interaction of testing and treatment, mono-method bias and mono-operation bias (Black & William, 1998).

All these potential threats need to be thoroughly evaluated when conducting a study to avoid any bias that can compromise the result of the study. It is common knowledge that researchers can be consciously and unconsciously bias the results a study if they lead the participants to react in the way that give them the desired answer. For instance, if the study pertains to some type of experimental drug treatment, the result could be muddled. Briggs (2008) proposed some possible solutions to the threats associated to construct validity such as use a better judgment when thinking through the concepts, utilize methods to say the concepts and inquire the assistance of expert to assess the operationalizations. Overall, Briggs claimed that while

statistical conclusion validity and internal validity together confirm a causal effect, external and construct validity are still required to generalize a causal conclusion to other settings (Briggs).

Validity issues have the ability to impede a researcher on how to select a research methodology to investigate a phenomenon because of all the potential threats existed. The researcher may find troubling to find the best method that will enable him/her to address the question that being considered to answer. Addition, selecting variables may also be a complicated task because of different factors such as ethics consideration, cost and time constraints and issue associated with internal, external and construct validity. Nevertheless, Cozby and Bates pointed out that no method is inherently better than another but rather, the choice should be made after analyzing potential issues that may be existed as a result of the previously discussed three validities.

Conclusion

Research can be characterized and assessed in terms of three validity, such as internal validity, external validity and construct validity. Each of them provide different view on any particular study and every research project should be evaluated on those three validities. However, there are certain threats associated with each concept of validity can compromise the results of any study. Thus, it is imperative that a novice researcher becomes familiar with the fundamental of research issues before conducting a study.