



Research Methods

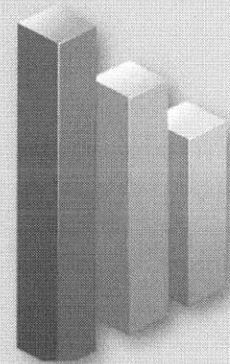
Unit IV:

Quantitative Research Methods

Unit IV: Quantitative Research Methods

What is Quantitative Research?

- It is research using numbers with respect to mathematical or computational techniques involving statistics.
- Hypotheses are formulated and proven or disproved based on mathematical data.
- Data collected can be summarized in simple and consistent terms (Lee & Lings, 2008).



(rg1024, 2010)

The first question we must consider is “What is quantitative research?”

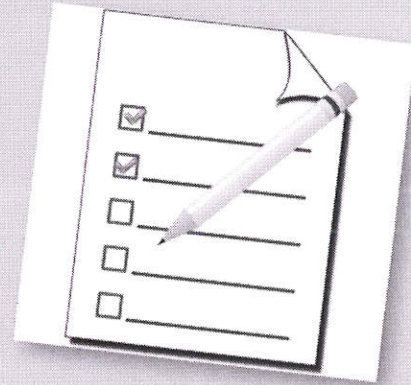
Quantitative research suggests that the researcher is conducting a research study utilizing numbers with respect to mathematical or computational techniques involving statistics. The idea is that the numbers will provide unbiased results that will enable the researcher to draw analogies and summaries from data, leading to overall conclusions about the general population.

Quantitative research begins with the researcher putting together several hypotheses based upon theory and secondary research gathered. Recall that the definition of a hypothesis is a series of propositions or statements made that are deemed to be accurate based upon limited research. The idea is then to either prove or disprove these hypotheses based upon the mathematical data that is gathered in the quantitative research study.

The use of statistics basically provides a venue whereby the researcher can summarize all the data collected in simple and consistent terms (Lee & Lings, 2008).

Methods of Quantitative Research

- Observation and experimentation (to be covered in Unit V)
- Questionnaires or surveys
 - Administered via mail, telephone, personal distribution, or the Internet
 - May address multiple research questions
 - Also compiles demographic, behavioral, geographic, and psychographic data



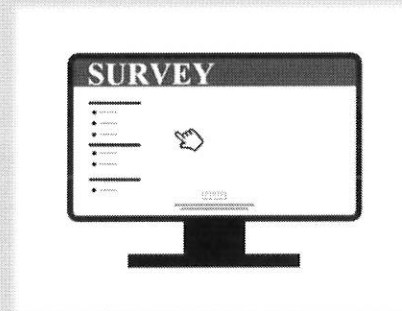
(jabernal, 2011)

There are several methods of collecting quantitative data, beginning with questionnaires, which will be discussed in this unit. Additionally, observation and experimentation methods will be analyzed in Unit V.

Questionnaires or surveys can be administered using the mail, telephone, personal distribution, or the Internet, and this has become an increasingly popular method of data gathering. Survey research tends to address multiple research questions, which might include things like what is happening, what the respondents believe, or even why the respondents have acted in certain ways. Demographic, behavioral, geographic, and psychographic data are also compiled to provide additional areas for analysis and correlation. There are several different forms of survey research, which will be explored on the next slide.

Types of Survey Research

- Door-to-door interviews
 - Conducted in the respondent's home or business
- Telephone interviews
 - Conducted over the telephone
 - Usage has increased
- Internet surveys
 - Completed using the Internet without an interviewer
 - Have become very popular due to convenience
- Mail surveys
 - Have decreased due to decreased use of U.S. mail system



(Dustwin, 2014)

There are several different types of surveys.

Door-to-door interviews—These consist of face-to-face survey interviews that are conducted in a respondent's home or business.

Telephone interviews—These are interviews conducted over the telephone. This mode continues to increase in usage, particularly when one business is interviewing another business.

Internet surveys—These are surveys completed by the respondent using the Internet without the presence of an interviewer. This type of survey method has become increasingly popular due to its convenience and typically small amount of time necessary for the respondent to complete the survey.

Mail surveys—These surveys are sent and returned via U.S. mail. As the use of the U.S. mail system has decreased, the use of mail surveys has also decreased.

Errors in Survey Research

- Two broad categories of error: random and systematic
- Random error
 - The data accumulated from the sample does not match data accumulated from the population.
 - To decrease this, the population size must be increased.
- Systematic error
 - This consists of measurement error and sample design error.
 - Sample design errors—These result from problems in putting together the survey.
 - Measurement errors—These result from a processing error, an administrative error, or a bias error.

Within the realm of this analysis, there exists the possibility of errors in survey research. It is imperative for the researcher to understand these possible errors. Two broad categories of error exist, including the random error and the systematic error.

The *random error* suggests that the data accumulated from the sample does not match exactly to the data accumulated from the entire population. The only way to decrease this error is to simply increase the overall size of the population.

The other category, *systematic error*, consists of the measurement error and the sample design error.

The *sample design error* consists of errors that result from problems in putting together the survey, such as the selection error (*selection error* is defined as using the wrong criteria to select the sample) or frame error (*frame error* is defined as using the wrong population). This, of course, can be alleviated with taking care in appropriately selecting the sample and accumulating an appropriate sampling frame.

Finally, *measurement errors* are a result of a processing error, an administrative error, or a bias error. A bias error can be found with the interviewer, responder, or in the

survey instrument itself. As a researcher puts together his or her research study, it is important to avoid these errors in order to allow for the highest quality of information from the survey research (McDaniel & Gates, 2015).

Other Components to Consider

Budget allocation

Time available for
completing survey

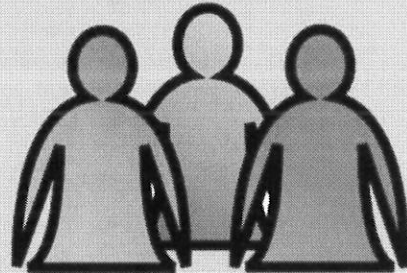
Length of the
survey

Number of
respondents
desired to complete
the survey

Through the process of identifying the form of survey that will be used with an eye on decreasing the survey errors, the researcher will need to consider several other components of the research plan. This includes the budget allocation and the time available for completing the survey. This also involves the length of the actual survey (how long it takes for the respondent to finish the survey) and the number of respondents desired to complete the survey.

Ethical Considerations of Survey Research

- Respondents have a right to privacy and confidentiality.
- Respondents shall not be deceived.
- Respondents have the right to be informed about the intent and purpose.
- Researchers must collect data honestly.
- Researchers must remain objective in the reporting of the data.



(Moon, 2010)

Survey research is by far the method that is the most comfortable for respondents as most everyone has been exposed to survey research in both their personal as well as professional lives. With this being the case, there are ethical considerations within survey research as well. The code of ethics enforces the idea that researchers have an obligation to protect the survey respondents from misrepresentation and exploitation. Specifically, researchers need to align with these points:

Respondents have a right to privacy and confidentiality. Researchers need to understand that technology might pose some lack of anonymity, and they should be mindful of this.

Respondents shall not be deceived in any manner.

Respondents have the right to be informed about the intent and purpose of the research.

Researchers must collect data honestly without the use of leading or biased questions.

Researchers must remain objective in the reporting of the data.

Conclusion

- Quantitative research uses numbers to draw analogies and summarize data.
- There are several methods of quantitative research.
- Surveys include door-to-door, telephone, and Internet interviews; and mail surveys.
- Random errors and systematic errors are two types of errors found in surveys.
- There are several ethical considerations that should be taken into account.
- Proponents speak to the reliability and objectivity of quantitative research.
- Quantitative research allows researchers to draw correlations while reducing subjectivity.

To summarize, quantitative research uses numbers and statistics to draw analogies and summarize data. There are several different methods of quantitative research that include observation and experimentation (which will be covered in the next unit) and questionnaires and surveys. Surveys include door-to-door interviews, telephone interviews, Internet interviews, and mail surveys. Surveys are subject to error, and the two types of error are random and systematic errors. In addition, there are several ethical considerations that researchers should take into account when using surveys. The respondents' right to privacy and confidentiality must be taken seriously.

Finally, proponents for quantitative research speak to its reliability and objectivity while allowing the use of statistical analysis to quantify the results. Additionally, it is suggested that quantitative research allows researchers to more easily draw correlations between cause and effect while reducing the researcher subjectivity.