Topic #2: Why Study Statistics?

Hopefully, the discussion above has helped you to understand a little better what the terms measurement and statistics mean. However, you may still be wondering "Why do I need to learn statistics?" or "What future benefit can I get from a statistics class?". Well, since you asked - there are five major reasons to study statistics:

The first reason is to be able to effectively conduct research. Without the use of statistics it would be very difficult to make decisions based on the data collected from a research project. For example, in the study cited in Chapter One, is the difference in recorded absenteeism between psychiatric and obstetrics nurses large enough to conclude that there is meaningful difference in absenteeism between the two units? There are two possibilities: The first possibility is that the difference between the two groups is a result of chance factors. In reality, the two jobs have approximately the same amount of absenteeism. The second possibility is that there is a real difference between the two units with the psychiatric unit being more nurses missing work. Without statistics we have no way of making an educated decision between the two possibilities. Statistics, however, provides us with a tool to make an educated decision. We will be able to decide which of the two possibilities is more likely to be true. We will base this decision on our knowledge of probability and inferential statistics.

A second point about research should be made. It is extremely important for a researcher to know what statistics they want to use before they collect their data. Otherwise data might be collected that is uninterpretable. Unfortunately, when this happens it results in a loss of data, time, and money.

Now many a student may by saying to themselves: "But I never plan on doing any research." While you may never plan to be involved in research, it may find its way into your life. Certainly, it you decide to continue your education and work on a masters or doctoral degree,

involvement in research will result from that decision. Secondly, more and more work places are conducting internal research or are becoming part of broader research studies. Thus, you may find yourself assigned to one of these studies. Finally, many classes on the undergraduate level may require you to conduct research (for example, a research methods or experimental psychology course). In each of these instances, a knowledge of measurements and statistics will be invaluable.

The second reason to study statistics is to be able to read journals. Most technical journals you will read contain some form of statistics. Usually, you will find them in something called the results section. Without an understanding of statistics, the information contained in this section will be meaningless. An understanding of basic statistics will provide you with the fundamental skills necessary to read and evaluate most results sections. The ability to extract meaning from journal articles and the ability to critically evaluate research from a statistical perspective are fundamental skills that will enhance your knowledge and understanding in related coursework.

The third reason is to further develop critical and analytic thinking skills. Most students completing high school and introductory undergraduate coursework have at their disposal a variety of critical thinking and analytic skills. The study of statistics will serve to enhance and further develop these skills. To do well in statistics one must develop and use formal logical thinking abilities that are both high level and creative.

The fourth reason to study statistics is to be an informed consumer. Like any other tool, statistics can be used or misused. Yes, it is true that some individuals do actively lie and mislead with statistics. More often, however, well meaning individuals unintentionally report erroneous statistical conclusions. If you know some of the basic statistical concepts, you will be in a better position to evaluate the information you have been given.

The fifth reason to have a working knowledge of statistics is to know when you need to hire a statistician. Most of us know enough about our cars to know when to take it into the shop. Usually, we don't attempt the repair ourselves because we don't want to cause any irreparable damage. Also, we try to know enough to be able to carry on an intelligible conversation with the mechanic (or we take someone with us who can) to insure that we don't get a whole new engine (big bucks) when all we need is a new fuel filter (a few bucks). We should be the same way about hiring a statistician. Conducting research is time consuming and expensive. If you are in over your statistical head, it does not make sense to risk an entire project by attempting to compute the data analyses yourself. It is very east to compute incomplete or inappropriate statistical analysis of one's data. As with the mechanic discussed above, it is also important to have enough statistical savvy to be able to discuss your project and the data analyses you want computed with the statistician you hire. In other words, you want to be able to make sure that your statistician is on the right track.

To summarize, the five reasons to study statistics are to be able to effectively conduct research, to be able to read and evaluate journal articles, to further develop critical thinking and analytic skills, to act a an informed consumer, and to know when you need to hire outside statistical help.