**CHAPTER 1**

## INTRODUCTION TO STATISTICS

**A: SUGGESTIONS FOR CLASS ACTIVITIES**

**Activity: Statistics and the Media**

 Try to encourage your students to feel that statistics can help them

understand current events as well as their own areas of specializations. Some

of your students will devoutly believe that they are math dim-wits and will

never understand these arcane statistical scribblings that you are putting up

on the board. Impress your students with the fact that although the field of

statistics has its detractors, and in many instances rightfully so, it is also

an area that offers rich rewards to those with some degree of quantitative

sophistication. At meetings, in journals and at conventions, students may find

themselves bombarded with the latest findings of social research studies, and

the results of these studies can often appear bewildering and at times even

misleading if the student is totally unfamiliar with the general rules of

statistical analysis and research design. Statistics and statistical research

should be an aid to judgment, not a replacement for it.

 The kinds of topics covered in this first chapter lend themselves to

lively discussions, usually based on current events reported in almost any

newspaper or magazine. Ask the students to be on the alert for articles that

attempt to use statistical persuasion to push for a point of view that may not

really be backed up by the numbers. As one example tell them that a recent US

administration took credit for creating wealth for American citizens during its

eight years in office. The percentage of individuals earning over $50,000 a

year, they said, had increased from 8% to 10%. But, by not factoring in

inflation, that may not be (and isn't) any gain at all. $50,000 today does not

have the purchasing power that $50,000 would have had eight years earlier. To

stretch the point, tell them that 50 years ago very few Americans earned over

$10,000, but does that mean we are all that much richer today?

 In the text, there is a discussion of a research study that attempted to

prove that as women left the kitchen and entered the work force, terrible

consequences ensued, such as dramatic increases in the prison population, small

business failures and reported felonies. Students must be constantly reminded

that just because various events might occur together they are not necessarily

linked and one should not be led into the trap of a cause-and-effect

explanation. On June 20, 1993 the New York Times ran an ad that advised its

readers that virtually all of society's problems can be blamed on TV. The ad

referred to a study by B.S. Centerwall at the Univ. of Washington that showed

that in the 30 year period following the introduction of TV in the United

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States and Canada, white homicide rates have increased by 93%, and in Canada by

92%, whereas in South Africa, which had no TV until the mid 1970's, the white

homicide rate decreased by 7%. Perhaps your students might comment on this

artful juxtaposition of statistics, and you might point out that a whole

host of things may have changed during that time span. And as for South

Africa, maybe whites were not being killed at the same rate, but that in itself

doesn't prove that there were fewer overall numbers of homicides, with or

without TV. Finally, it might be mentioned that some of history's most

notorious murderers, Hitler, Stalin, Al Capone and Jack the Ripper, never saw

one second of TV.

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**B. Multiple Choice Items**

1-1. The inherent fallacy in the argument that capital punishment is not a

deterrent (since pockets were being picked even at the public hanging of a

pickpocket) is that

 a. pickpockets were never hanged

 b. you can't compare groups of unequal sizes

 c. there was no comparison or control group

 d. you can't make comparisons with only nominal data

1-2. Whenever two events occur simultaneously, such as increasing numbers of

joint bank accounts and increasing numbers of felonies, one must be careful not

to

 a. assume that one event is the cause of the other

 b. assume that any correlation exists between them

 c. assume that the data have been reported honestly

 d. all of these

1-3. The founding of probability theory is popularly credited to

 a. the Chevalier de Mere

 b. Sir Francis Galton

 c. Karl Pearson

 d. Blaise Pascal

1-4. William Sealy Gossett, the statistician at the Guinness Brewing Company,

published his works using the pen name

 a. Professor

 b. Blaise Pascal

 c. Cicero

 d. Student

1-5. Statistics as a general field is divided into two sub-areas. They are

 a. predictive and inferential

 b. descriptive and inferential

 c. nominal and ordinal

 d. none of these

1-6. When we say that the actual average height of all adult females in the U.S.

is known to be 5' 6", we are using

 a. predictive statistics

 b. probability statistics

 c. inferential statistics

 d. descriptive statistics

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1-7. Techniques which are used for describing small or large amounts of data in

abbreviated form, are called

 a. descriptive statistics

 b. inferential statistics

 c. predictive statistics

 d. probability estimates

1-8. The difference between inferential and predictive statistics is that

 a. inferential extrapolates, whereas predictive does not

 b. predictive extrapolates, whereas inferential does not

 c. inferential assumes that a sample has been measured, whereas predictive

 makes no such assumption

 d. there is no difference between them

1-9. When a researcher attempts to estimate the characteristics of an entire

population on the basis of sample measures, the techniques employed are called

 a. inferential statistics

 b. descriptive statistics

 c. skewed statistics

 d. b and c, but not a

1-10. The researcher using inferential statistics always makes predictions that

are based on having measured

 a. a population

 b. a sample

 c. the entire group being predicted

 d. in inferential statistics predictions are never made

1-11. The goal of the researcher using inferential statistics is to

 a. make better-than-chance predictions

 b. predict the characteristics of the entire group, based on measures taken

 on a smaller group

 c. describe the difference between the highest and lowest score

 d. a and b, but not c

1-12. An example of a variable would be

 a. height

 b. weight

 c. the number of inches in a foot

 d. a and b, but not c