Psy 303
Research Methods

Winter, 1985
E. Ludman
MWF 10:30-11:20

COURSE INFORMATION

Instructor: Evette Ludman
Office: 485 Straub
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And by appointment

Paper Grader: Susan Taylor
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Required Text: Chadwick, B.A., Bahr, H.M., and Albrecht, S.L. (1984). Social Science Research Methods. Englewood Cliffs NJ: Prentice-Hall.

Required Handbook: "Handbook for Psychology 303" available at EMU printshop

Grading: Course grades will be based upon performance in 9 out-of-class ASSIGNMENTS, an in-class MIDTERM EXAM, and an in-class FINAL EXAM.

Each of the nine ASSIGNMENTS will be worth 10 points. The MIDTERM EXAM will be worth 25 points. The FINAL EXAM will be worth 35 points.

Thus, a possible 90 + 25 + 35 or a total of 150 points can be earned. Of these 150 points, anyone earning:

| | |
|---|---|
| A total of 135 to 150 points will receive an | A |
| A total of 120 to 134 points will receive an | B |
| A total of 105 to 119 points will receive an | C |
| A total of 90 to 104 points will receive an | D |
| Less than a total of 89 points will receive an | F |

Based on the actual distribution of FINAL GRADES, this criterion might be relaxed, but not STIFFENED.

Late Assignments: Assignments are due at the beginning of the class period on the date due. Assignments will be accepted up to 24 hours after their date due, but ONE POINT will automatically be subtracted. NO assignments will be accepted after 24 hours past the due date.

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COURSE SYLLABUS

| Date | Lecture Topic | Assignment Due | Readings |
|---|---|---|---|
| W Jan 9 | Overview of course | | |
| F Jan 11 | Collecting and describing data | | (Text Ch. 13)<br>(HB Sect. 1) |
| M Jan 14 | Forming and testing hypotheses | | Text Ch. 1<br>HB pp. 2-1 to 2-16 |
| W Jan 16 | Locating published research<br>* IMC STUDIO B 10:30-11:20 | 1 | HB Sect. 5<br>(HB Sect. 6) |
| F Jan 18 | Reporting research | | (Text Ch. 14) |
| M Jan 21 | Operational definitions and sampling | 2 | Text Ch. 3 |
| W Jan 23 | Evaluating generalizability | | Text Ch. 2<br>HB pp. 2-17 to 2-19 |
| F Jan 25 | Measuring hypothetical constructs (standardized tests) | 3 | HB Sect. 4 |
| M Jan 28 | Evaluating tests (validity and reliability) | | HB pp. 2-19 to 2-23 |
| W Jan 30 | Interpreting correlation | | HB Sect. 7 |
| F Feb 1 | Exploring alternative hypotheses | 4 | HB pp. 2-23 to 2-25 |
| M Feb 4 | Specialized data-gathering procedures | | none |
| W Feb 6 | Ethical issues in research | 5 | Text pp. 16-20 |
| F Feb 8 | MIDTERM EXAM | | none |
| M Feb 11 | Exam feedback, observational research | | Text Ch. 4 |
| W Feb 13 | Coding observed behavior | | HB 2-25 to 2-28 |
| F Feb 15 | Collecting observational data | | none |
| M Feb 18 | Conducting questionnaire research | | Text Ch. 6 |
| W Feb 20 | Questionnaires and rating scales | 6 | none |
| F Feb 22 | Conducting interview research | | Text Ch. 5 |
| M Feb 25 | Interview research cont. | | none |
| W Feb 27 | Developing questionnaire and interview materials | | none |
| F Mar 1 | Conducting experimental research | | Text Ch. 7 |
| M Mar 4 | Experimental research cont. | | none |

| | | | |
|---|---|---|---|
| W Mar 6 | Controlling for possible confounds | 7 | none |
| F Mar 8 | Talking about your research--<br>preparing a presentation | | HB Sect. 8 |
| M Mar 11 | Talking about your research--<br>student presentations | | none |
| W Mar 13 | Student presentations | | none |
| F Mar 15 | Student presentations | 9 | none |
| Th Mar 21 | FINAL EXAM, 3:15 PM | | |

PSYCH 303

Summary of Film

STATISTICS AT A GLANCE

The film covers the basic concepts of statistics that are useful to students of psychology. By means of animation it presents the properties of distributions (collections of data organized according to a scheme) and shows how different distributions may be related to one another. Topics taken up are as follows:

A. Descriptive Statistics: characterizing a set of data that comprise a distribution.

1. Frequency distributions - constructing a graph from data that have been gathered.

   a. Kinds of graphs: histogram; polygon; curve. Distinguished from one another in terms of how the lines forming them are drawn, each technique involving different mathematical assumptions.
   b. Shape or contour of graph: different contours reflect different distributions and are based upon differences in central tendency and variability (see 2 & 3 below).

2. Central tendency: the clumping together of data.
   a. Mean - the arithmetical average
   b. Median - the middle score of a distribution
   c. Mode - the most frequent score or measurement; there may be more than one

3. Variability: the degree of scattering of data.
   a. Range - the difference between the lowest and the highest scores
   b. SD (standard deviation) - a kind of average of the variations from the distribution mean
   c. Standard scores - each measurement is expressed as a point on a scale made up from the standard deviation
   d. Percentiles - expressing each measurement in terms of the percentage of persons or objects which got lower scores

B. Correlation: showing how two distributions of scores on the same subjects relate to one another.

1. Scatter diagram or plot

2. r - a numerical index of the strength or degree of relation between two distributions (called the product - moment correlation)

C. Inferential Statistics: Using descriptive and correlational statistics to make predictions and for deciding when numerical differences are, or are not, due to chance.

Psy 303
Assignment #1

The purpose of this assignment is to acquaint you with how to collect data using a simple questionnaire, describe those data using some simple statistical measures, and analyze them using some simple statistical tests.

In addition, this assignment is designed to give you some experience in reporting the results of those processes. For this reason, the paper you turn in should be formatted and written in the style of a "Results" section in a formal research report (see section 2 of the handbook).

In writing these results you must answer the following questions. To answer these questions, you will, of course, have to compute some statistics. Each is illustrated in Section 1 of the Handbook.

When indicated, present the required information in a table or figure. Otherwise, simply use prose. But try not to be redundant. The title on the first page shourl be: RESULTS.

1. What percentage of this class are psychology majors? What percentage of this class are females? Is being a psychology major significantly related to being a female? (Use a $\chi^2$ chi-square test).

2. What is the mean and standard deviation of the females' height? The males' height? All classmembers' height? What is the mean and standard deviation of the females' weight? The males weight? All classmembers' weight?

(NOTE: Present all the information asked for in Question 2 within a Table. In the text of the paper, direct the reader to this table by saying something like "The means and standard deviations for the females, males, and all classmembers' height and weight are presented in Table 1.")

3. Briefly comment on the amount of variability found within the range of the males' vs. the females' vs. all classmembers' height and weight.

4. Does the average height of the females differ significantly from that of the males? (Use a t-test for independent samples.) Does the average weight of the females differ significantly from that of the males? (Again, use a t-test for independent samples.)

5. Plot a frequency distribution of the classmembers' number of siblings. (This should be a figure. Direct the reader to it.) Is there any interesting pattern in those data?

6. Make a classification of "large family" vs. "small family" based on the number of siblings. For example, four or more siblings could be classified as a large family; less than four siblings could be classified as a small family. Tell the reader how you made this classification and what proportion of classmembers are in each group. Is being from a large family significantly related to being a male? (Use a $\chi^2$ chi-square test.)

Psy 303
Assignment #3

The purpose of this assignment is to give you some experience in specifying how a particular research hypothesis can be tested. Your task is to choose one of the following research hypotheses. Then you should think about the optimal sample of subjects (and/or items), operational definitions, and procedures needed to test the hypothesis.

In addition, this assignment is designed to give you some experience in reporting how you would test a particular research hypothesis. For this reason, once you have decided about the optimal sample(s), operational definitions, and procedures you are to describe your chosen methodology in a standard format. This format is the format used by researchers when they write the "Methods" section of their formal research report (see Section 2, part 4 of your Handbook).

For clarity, use the subheadings Subjects, Materials (and/or Apparatus), and Procedure. Under each you should include the pertinent information. Also, for practice, use the past tense even though you haven't actually conducted the research.

1. Blondes have more fun.
2. Classes at the U of O are harder than at Lane Community College.
3. Full moons make people act crazy.
4. Bigger cities have higher crime rates.
5. Dripped coffee tastes better.

## Method

Subjects. One-hundred twenty seniors from a racially integrated high school in the San Francisco Bay area served as subjects. Half were male and half were female. Few planned to to on to any 4-year college. Students who were not planning to go on to college were purposely sought as subjects so that they might be both appropriate for and interested in jobs like those advertised by the telephone company. (As seniors, many would even be preparing for jobs like these in the near future).

Materials. Each student was given a booklet containing 12 job advertisements. These advertisements included four telephone jobs and eight nontelephone jobs. In order of appearance, the jobs were: applicance sales, telephone operator, photographer, travel agent, telephone frameman, dental assistant, taxicab driver, telephone service representative, assistant buyer, kepunch operator, telephone lineman, and public relations/advertising.

The cover sheet introduced all 12 jobs as follows: "All of the jobs have a starting salary of between $100 and $120 per week with regular raises after that. None of the jobs require any previous training or experience beyond high school graduation; all of them provide paid on-the-job training." The phrase, "An Equal Opportunity Employer m/f," appeared at the end of every job advertisement.

One-third of the booklets advertised the telephone jobs in the sex-biased format used by AT&T. In other words, these ads were copied verbatim from the AT&T ads and brochures furnished to us by the EEOC. The four sex-biased telephone advertisements were worded as follows:

Telephone Operator

Who Says it's a Man's World?

Behind every man's telephone call, there is a woman. She's a smart woman. She's efficient. She has to be. She places the complex long distance calls people cannot place themselves or helps them to locate telephone numbers.

Hers is a demanding job. But we make it worth her while. We can make it worth your while too. Not only do we pay a good salary to start, but also offer group life insurance, medical coverage, good vacations with pay and free pensions.

A stepping stone to management positions.

(Note: The other three sex-biased ads were also illustrated here.)

## Method

Subjects. The subjects were 100 undergraduate students enrolled in introductory psychology classes at the University of Texas at Austin. Subjects participated in the experiment as a means of fulfilling a course requirement.

Materials & Procedure. One-hundred sentences were selected from each of 100 successive articles appearing in Reader's Digest, beginning with the January, 1978 issue. Within an article, the first sentence containing at least nine words was chosen. The first through eighth words were designated as the sentential context; the ninth word was designated as the target word. Consistent with the sentence length frequencies reported by Kucera and Francis (1967), in 19% of the sentential contexts the target word occurred as sentence-final. As originally selected, forty-nine of the target words selected were function words; fifty-one were content words (according to the criteria outlined by Clark & Clark, 1977, pp. 21-22) but for the simplicity of symmetry, one more of the former was selected to replace one of the latter.

The 100 sentential contexts were listed, in a randomized order, down the left hand margin of a page. To the right of the context appeared a blank. Subjects were instructed to make one guess about what the next word of each sentence might have been and to write down this prediction.

The same four telephone jobs were presented in three different formats: the sex-biased format used by AT&T, a sex-unbiased format, and a sex-reversed "affirmative-action" format. (Note: These too were illustrated.) All 8 nontelephone ads were worded in sex-unbiased fashion and remained constant in all booklets. In other words, only the wording of the telephone jobs changed from con dition to condition.

Procedure. Upon entering the experimental room, each subject was handed an experimental booklet. For each advertisement, the subject was asked to indicate on a 6-point scale how interested he or she would be in appl ying for each job. The scale ranged from "Very Uninterested" to "Very Interested" and was labeled at each point. For purpose of analysis, a subject was defined as "interested in applying" for a job if he or she checked any of the following three categories: "Slightly Interested," "Moderately Interested," or "Very Interested." A subject was defined as "not interested" if he or she checked "Slightly Uninterested" "Moderately Uninterested," or "Very Uninterested."

## Method

Subjects. The subjects were 25 undergraduate students at the University of Texas, enrolled in introductory psychology, who participated in the experiment as a means of fulfilling a course requirement. All subjects were native speakers of English. No subject who had participated in the word prediction task participated in the present experiment.

Design and Materials. The experimental stimuli for the word recognition task were the 100 sentence frames and their accompanying target words used in the word prediction task. Each target word was presented in both the context and the no-context condition. In the context condition, the appropriate sentence frame preceded the target word. In the no-context condition, a frame composed of eight random words preceded the target word. The random-word frames were prepared by randomly selecting one word from each of eight other original sentence frames. An example random-word frame is "ME EVENING EFFECT WAS WERE SITS THAT AND." Recall that half of the target words were function words and half were content words. The experiment, therefore, was a 2 (word class: content vs function) X 2 (context: context vs no-context) within-subjects repeated measures design. Ten target words that were function words and ten target words that were content words, and their respective sentence and random-word frames, were randomly chosen to serve as practice items. The experimental stimuli are presented in the Appendix.

Apparatus and Procedure. The experiment was controlled by a Digital Equipment Corporation PDP-11/03 which was responsible for stimuli randomization, presentation, and data collection. The sentence and random-word frames, and target words, were displayed in upper case white Matrox letters upon a black background of a Setchell Carlson television screen. Two subjects were tested per experimental session with each

subject occupying his/her own sound-attenuated room and the experimenter monitoring the session from an adjacent room. Subjects were seated approximately 3 ft in front of the television screen. A stimulus trial consisted first of the presentation of the sentence or random-word frame. After a 4 sec interval, a short tone was sounded as a signal to the subjects that the target was about to appear. The target word was displayed 500 msec after the tone sounded. A millisecond timer was activated coincidentally with presentation of the target word. The entire stimulus item (sentence or random-word frame and target word) remained in view until subjects in both booths had made their response. One sec elapsed between the removal of a stimulus item and the presentation of the next trial.

Subjects were informed of the sequence of events for each stimulus trial. They were told that an eight word phrase would first appear on the screen before them and that their task at that point was to read carefully each of the eight words. They were told that after the eight word phrase remained on the screen for a few seconds that an additional word, the target word, would appear. Their task at that point was ~~was~~ to name the target word as rapidly and as accurately as possible.

Psy 303
Assignment #5

One purpose of this assignment is to stimulate you to think about alternative explanations of research findings. Your task is to choose one of the four research findings presented on the next page. For that finding, you should think about any possible alternative explanations (i.e., explanations other than the one(s) the researchers assumed). More specifically, you should come up with three reasonable alternative explanations.

A second purpose of this assignment is to give you some experience in writing a discussion section in APA style. So, the output of this assignment will be a discussion section. It should comprise at least five paragraphs. In the first paragraph, summarize the research finding and the explanation the original researchers offered. In the second, third, and fourth paragraphs, discuss your three alternative explanations, presenting each explanation in its own paragraph. In the last (fifth) paragraph, sketch what would be a better way to test the researcher's original hypothesis. You may extend your discussion section beyond these five paragraphs, but these five paragraphs must be included.

An example of what your completed assignment should be like is included. On the fourth page is an example research finding, and on the fifth and sixth pages is an example discussion section concerning the example research finding.

## Research Finding #1

Dr. John McGimpsey of the dental surgery department of Belfast University reported a study focused on the frequency with which people pass out in the dental chair. Believe it or not, the rate for men was three times higher than it was for women. The lead sentence in his magazine report asserted: "Men are the weaker sex when it comes to visiting the dentist." Since most fainting episodes occur before noon, Dr. McGimpsey suggested that the difference between the male and female rates may be attributable to men's not eating a proper breakfast at the beginning of the day.

## Research Finding #2

An article appeared in a local newspaper concerning the cause of highway accident deathrates. In part, this report stated: "Most motorists are aware that Americans are not observing the national 55-mile-per-hour speed limit as zealously as they did when it went into effect about three years ago. (Note this article appeared in 1977.) And it's beginning to show up in the highway death toll. In 1973, nearly 50,000 lost lives in automobile accidents. In 1974, there was a decrease of almost 20 percent, and of 2 percent more in 1975. In 1976, however, highway deaths increased slightly, from 44,690 in 1975 to 44,807 last year. With vacation season coming on, it surely behooves motorists to observe the 55-mile-per-hour limit. Otherwise, they may become a part of the new statistical trend." Thus, in this article, the authors were advocating a cause-and-effect relationship between driving speed and fatalities.

## Research Finding #3

In the mid-1970's, the Institute of Outdoor Advertising (IOA) conducted a research study aimed at proving the superiority of billboards as an advertising medium. The goals and results of this empirical investigation were reported in two IOA promotional brochures. One of those brochures contained the following:

"We've long believed that Outdoor can outperform other media in getting across a message to the public. What we needed, here at the Institute of Outdoor Advertising, was a way of proving it. Last year we thought of a way. We would see if our medium, by itself, could increase public awareness of the name of Miss America 1975.

We approached the Outdoor companies with our plan. We asked them to donate space not already sold or eearmarked for public service announcements. They gave us 10,000 panels -- or about $1.5 million worth of Outdoor at the going rate.

Our poster was to go display for two months beginning January 1, 1975. (Note: The poster showed a large picture of Miss America with her crosn, scepter, and roses; the only message on the poster was 'Shirley Cothran, Miss America 1975' written in large letters.) But before the poster went on display, the Outdoor companies sponsored a series of studies to determine public awareness of Miss America's name prior to testing. Random sample surveys were conducted during November and December, 1974 in 44 metropolitan markets by 25 colleges and universities and 12 independent research organizations. Over 15,000 adults were questioned.

Despite all the exposure Miss America had received (previously) on TV and radio and and in print, only 1.6% of the respondents gave the correct answer to the question, ' What is the name of Miss America 1975?'

Then our posters went up. And in February and March 1975, a second wave of over 15,000 interviews were conducted by the same research teams. This time, 16.3% of the respondents -- about one of every six -- knew who Miss America 1975 was. That's a 10-fold increase in awareness. Projected nationally it would mean that Outdoor had communicated a new and difficult name to more than 20 million adults. Through a two-month posting, Outdoor made Shirley Cothran the best-known reigning Miss America in history."

Research Finding #4

In 1961, D. Mechanic and E.H. Volkard developed a measuring instrument that attempts to assess one's tendency to "adopt the sick role." This instrument is made up of three hypothetical situations of a medical nature, and to each situtation the respondent indicates how likely it is that he or she would go to a doctor.

More recently, a researcher hypothesized that first-borns (oldest children) would score lower as a group than children born later. The rationale behind his hypothesis was the effects of differential parenting. That is, he hypothesized that first-born children have parents who are less knowledgeable about child rearing and thus more sensitive to, and nervous about, any abnormalities in their children's health (e.g., a runny nose or a mild fever). So, the first-born is taken to the doctor more often than later arriving children because later parents have gained more confidence or experience in child rearing. Because the first-born is taken to the doctor more often, he or she is subtly encouraged "to expect and accept contact with medical authorities and subsequently enter into the role of being sick under conditions of minimal symptoms" (Franklin, 1973, p. 437).

To test his hypothesis, the researcher administered the three-item questionnaire to 152 volunteers attending a midwestern university. The mean score of the first-born respondents was significantly lower than that of the remaining subjects, indicating that the first-borns had a greater willingness to seek medical assistance. Hence, the researcher concluded that his hypothesis had been supported.

Sample Research Finding

The people who market Smith-Corona typewriters have put out an advertisement in news magazines concerning students' grades on research papers. The ad is titled "Students Who Type Usually Receive Better Grades." The marketers' evidence comes from a national survey of 400 high school and college instructors. Each instructor was presented several statements, and the task was to choose one of five responses for each statement: agree strongly, agree somewhat, have no opinion, disagree somewhat, disagree strongly. Over 50 percent of the sample agreed (either strongly or somewhat) with the statement, "Students who type usually get better grades." The advertisement implies that students' grades are likely to go up if they turn in research papers that are typed rather than handwritten.

Thus, there are other factors -- motivation and socio-economic background, to name just two -- that might make the two groups differ beyond the fact that one group typed their papers and the other did not. Without holding these factors constant across the two groups, one cannot safely conclude that the act of typing is the cause of higher research paper grades.

A much better test of this hypothesis would be a study in which all these possibly spurious variables were held constant except for the one of interest: paper neatness. One way of acheiving this goal might be the following. Construct four versions of each of 20 research papers. All four versions of each paper would be identical in terms of content, wording, spelling, length, and so on. The only difference between the four versions would be the neatness of its appearance. One version could be beautifully handwritten, one version copied with average handwriting neatness, one version handwritten in a nearly illegible manner, and the last one typed. These papers should then be randomly distributed to a rather large sample of high school or college instructors. Each instructor should receive one copy of the 20 original papers and an equal number (i.e., 5) of each neatness type. The instructors would then be asked to grade all 20 papers in their usual manner of grading. If there were any differences in the average grade assigned to particular versions, a stronger causal relationship could be supported than the one offered by the Smith-Corona advertisement.

Because most students would like to receive high grades, they would probably be willing to invest their money in a typewriter and their time in typing if there were a causal relationship between typed papers and high grades. However, without stronger evidence to suggest this, it seems unfair to waste their time and money -- unless, of course, typing their papers is required or highly suggested by their instructor.

## Discussion

The clear implication of this advertisement is that students will raise their grades if their papers are typed. That is, based upon the results of their survey, the prople who market Smith-Corona typewriters have led prospective consumers to believe that a cause-and-effect relationship exists: Typed papers cause higher grades. However, the evidence the advertisers report does not definitively prove such a causal relationship; alternative explanations exist.

First, the marketers' survey does not clearly prove that if a particular student actually did type his or her paper instead of handwriting it, that she or he would actually receive a higher grade on that paper. Rather, the only evidence that this survey presents is that a sample of high school and college instructors believe that students who type their papers get higher grades. Whether indeed students, or their typed papers, actually do receive higher grades has not been proven. In other words, the instructors' intuitions or beliefs may not be consistent with the facts.

Furthermore, even if students who type their papers do indeed receive higher grades than students who handwrite their papers, this difference might be due to differences between the two groups of students. For example, it might be that students who go to the trouble of typing their papers are more highly motivated than students who do not. This higher motivation level might have led to a more extensive search in the library of the available reference materials, a more extensive reading of these materials, or a more extensive process in which these materials were synthesized into the final research paper. These are just a few of the activities that a more highly motivated student might engage in that could put him or her in a better position to write a high-quality paper.

A second possible difference between students who do and do not type their papers might be their backgrounds. For instance, it is possible that students who own typewriters come from families from a higher socio-economic strata. If so, perhaps within these more affluent households there are more books or other educational sources. A higher socio-economic background might have led to the student being exposed to more places or cultural events through family trips or activities. It might also be that students from more affluent families are more strongly encouraged to adopt a value system that prizes high grades.