

DRIVER BEHAVIOR STUDY

EXP 3082L -- Jay Gould's Elaboration on Larry B. Christensen

The purpose of this exercise is to give you experience in naturalistic observation, etc. with and without intervention (see “Reactive and Non-reactive Measurement” in the lecture-course *Handbook* written by your instructor). You are to work as a team of two with a partner that you select from your research group of four to six fellow students.

It has been suggested that people change the lawfulness of their driving behaviors if they think they're being watched. A natural and convenient place to observe driver behavior is at a stop sign.

First, before carrying out the steps on the following pages, you are to concisely hypothesize the following in the space below (research partners can differ):

(1) The expected direction of effect, for male and female drivers combined, of being obtrusively observed (i.e., noticeably watched) versus unobtrusively observed; and (2a) Any expected difference between male versus female drivers when they are obtrusively observed, and (2b) when they're unobtrusively observed.

(1) _____

(2a) _____

(2b) _____

Next you are to gather data to determine whether your hypotheses are supported. A stop sign can provide an observational environment that is relatively similar across conditions and research participants, so long as there are no varying undesirable environmental or other factors. Examples that might influence driving behavior at stop signs are weather and traffic density (*extraneous variables*). Can you think of any others?

To test your hypotheses you must measure what male and female drivers do (*dependent variable*) when they are confronted with a stop sign under the two observation conditions (*independent variable levels*): the obtrusive condition versus the unobtrusive condition.

To carry out your driver behavior study you must complete the following steps, which are explained in more detail below:

- (1) *Operationally define* the driving behavior terms for various stops;
- (2) Determine how your observations will be *obtrusive versus unobtrusive*;
- (3) Choose a good *location, time period, and sequence* for observations;
- (4) *Collect* your data under the two observation conditions
- (5) *Summarize* your data;
- (6) *Analyze* your data;
- (7) *Interpret* your data and *write a research report*.

Step 1: Operationally Defining your Driving Behavior Terms for Stopping

Provide *operational definitions* of the *dependent variable measures* (see the lecture *Handbook*) by stating clearly and concisely what you consider to be a:

Full Stop: _____

Rolling Stop: _____

No Stop: _____

Step 2: Operationally Defining your Obtrusive and Unobtrusive Conditions

State how your *independent variable will be manipulated* so that you will be visibly noticeable (obtrusive) versus hidden (unobtrusive) when gathering your data. That is, where will you stand or sit, and how will you behave and dress?

Obtrusive: _____

Unobtrusive: _____

Step 3: Selecting Your Observation Location, Time Period, and Sequence

Choose a stop sign that you know from experience is one where drivers often do not make full stops (consider an on-campus site or a parking lot in a mall). This site must provide a location where you can obtrusively as well as unobtrusively observe drivers. You may need to go to the selected stop sign area before conducting your study to determine if your methods will work and what further preparations are needed. Check with other teams to make certain that you will not be making your observations the same day and time, should you happen to choose the same stop sign location. Consider time of day and possibly day of the week as extraneous variables to be controlled. You also want to keep the weather and traffic density as well as practice and fatigue of the observers approximately the same across your two observation conditions. Hence, how will you sequence the observation conditions, i.e., will you do all of one type first and all of the second type later? This is a very important concern.

Location: _____

Day(s): _____

Time(s): _____

Observation Sequence: _____

Step 4: Collecting your Data

Record you data by filling in the four sheets on the following pages. Two must be filled in when you are an *unobtrusive observer* and the other two must be filled in when you are an *obtrusive observer*. Compare your observation with your team partner. Delete those observations where there is not agreement and collect additional data until there is agreement on all 100 required observations, 50 under each condition. This is an opportunity to learn about inter-rater reliability.

Under "Vehicle Type": If you are observing on-campus write in F = Faculty, E = Employee, S = Student, and O = Other. If you are observing off-campus, write in S = Sports Car, F = Family Car, V = Van or SUV, and T = Pickup Truck.

INVESTIGATOR: _____ PARTNER(S): _____
 DATE: _____ DAY: _____ TIME: _____ WEATHER: _____

UNOBTRUSIVE CONDITION

Observation # (and any special comments)	Gender/Sex of the Driver: M = Male F = Female	Number of Persons in Vehicle	Vehicle Type: = = = =	Type of Stop F = Full Stop R = Rolling Stop N = No Stop
1				
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25				

INVESTIGATOR: _____ PARTNER(S): _____
 DATE: _____ DAY: _____ TIME: _____ WEATHER: _____

UNOBTRUSIVE CONDITION

Observation # (and any special comments)	Gender/Sex of the Driver: M = Male F = Female	Number of Persons in Vehicle	Vehicle Type: = = = =	Type of Stop F = Full Stop R = Rolling Stop N = No Stop
26				
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48				
49				
50				

INVESTIGATOR: _____ PARTNER(S): _____
 DATE: _____ DAY: _____ TIME: _____ WEATHER: _____

OBTRUSIVE CONDITION

Observation # (and any special comments)	Gender/Sex of the Driver: M = Male F = Female	Number of Persons in Vehicle	Vehicle Type: = = = =	Type of Stop F = Full Stop R = Rolling Stop N = No Stop
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INVESTIGATOR: _____ PARTNER(S): _____
 DATE: _____ DAY: _____ TIME: _____ WEATHER: _____

OBTRUSIVE CONDITION

Observation # (and any special comments)	Gender/Sex of the Driver: M = Male F = Female	Number of Persons in Vehicle	Vehicle Type: = = = =	Type of Stop F = Full Stop R = Rolling Stop N = No Stop
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Step 5: Summarizing Your Data

Summarize your data in the following tables, showing the frequency (#) and percentage (%) of various stops as a function of the listed variables. See Step 6 for additional instructions regarding percentages (think carefully about how you do the computations).

UNOBTRUSIVE CONDITION

	Total (M+F)		Gender/Sex				# of People in Vehicle						Vehicle Type (fill in letters)				
	#	%	M		F		1	2	3	4	5	6					
Full Stop																	
Rolling Stop																	
No Stop																	

OBTRUSIVE CONDITION

	Total (M+F)		Gender/Sex				# of People in Vehicle						Vehicle Type (fill in letters)				
	#	%	M		F		1	2	3	4	5	6					
Full Stop																	
Rolling Stop																	
No Stop																	

Step 6: Analyzing Your Data

There are two approaches you can take with your data: (1) descriptive statistics and (2) inferential statistics. In research, both are commonly used (see the lecture *Handbook*).

(1) Descriptive statistics. Using your table of frequencies done for step 5 (summarizing your data), you should compute and add to the table, if you haven't already, the *percentage* of individuals in each of the stopping categories under the unobtrusive vs. obtrusive conditions. Calculate the percentages for the total sample and also for men and women separately (think carefully about what you use for your divisors).

(2) Inferential statistics. All members of each team should apply a *Chi Square Analysis* (see, e.g., the Statistical Appendix: Chi Square handout and example of computations) to determine whether there was a significant difference in the types of stops made under the two different conditions (unobtrusive observation vs. obtrusive observation) when the data are combined for men plus women. In addition, one member of each team should compare whether there was a significant difference in the stopping behavior of men vs. women in the unobtrusive condition, and the other member should compare the data in the obtrusive condition. This will allow you to look for a possible *interaction* (see the lecture *Handbook*), i.e., whether the sex/gender of the participant influences the effect of the observation condition on driver behavior at stop signs. Provide a copy of your male vs. female analysis to your partner so that he/she will have a complete set of statistical analyses to use in Step 7.

Note: Depending upon what you want to know, you would compare your observation frequencies in different ways. A *Three-Way Chi Square Analysis* (see statistics books) would do all major comparisons for this study at once, but you are not being asked to use this more advanced analysis for this study.

In addition to the analyses you are asked to do above, you might also want to analyze for type of vehicle and/or number of persons in the vehicle. At least look at the *descriptive statistics* to see if there is substantial evidence of a relationship. (Note: For on-campus observations you could have a student driving an employee or faculty tagged vehicle, and vice versa. What are the implications of this for your study? This and other possible problems should be discussed in the interpretation of your findings—Step 7)

Step 7: Interpreting your Findings and Writing the Research Report

Now that you have analyzed the data, you must *interpret* its meaning. Look at the computed percentages and Chi Square Analyses and decide what they tell you about the behavior of drivers at stop signs.

Write up your interpretation as a Discussion section covering both your *descriptive and inferential statistics* and how they relate to your research hypotheses. Include this as the final section of your research report that also contains the following earlier parts:

Title Page, with your research partner's name listed *after* your own;
Introduction, which states the research problem/question and hypotheses;

Method, which describes your participants, materials, and procedure--including your operational definitions of the independent and dependent variables, and control of extraneous variables;

Results, which includes a summary statement of your data and statistical analyses.

As an Appendix at the end of the report, include the filled in Driver Behavior Study handout--with *all* your definitions, observation data sheets, and summary tables--as well as statistical computations (of course ordinarily only *summary* tables and figures would be included in a professionally published research paper).

Note: Your writing must be done independently (not with your team partner), using your own data records and computations (except for the one shared), as well as your own words and ideas--DO NOT PLAGIARIZE!

In the discussion section of your paper, be certain to also address the question of whether you simply conducted naturalistic research, or whether you actually conducted an experiment. If the latter, indicate what were the *experimental vs. correlational independent variables* (see lecture *Handbook*). Explain your answer(s) clearly.

An abstract and references are not required for this report. But, *in all other respects you must follow the forma/style* of the *APA Publication Manual*. Read the Manual carefully--you will be using it for all you laboratory assignments. There are checklists in the Manual (see page xix), and it also contains a sample paper to illustrate format/style. In addition, the first two chapters of the *Manual* are a good introduction to the "Content and Organization of a Manuscript" and the "Expression of Ideas."

If you have never written a research paper in APA format/style, you should review Chapter 5 in the lecture *Handbook*, and one or more published research papers in journals (e.g., see those in the lecture-section book by Milinki). This will also give you a head start on Exercise #2, which will be your next assignment, and which requires a literature review.

Keep in mind that good writing involves more than format/style. The five criteria of research writing are: accuracy, completeness, clarity, conciseness, and readability. These are covered in Chapter 5 of the lecture *Handbook*.

CLASS DISCUSSION:

After the research is completed and written up, we will discuss the findings in class. The paired members of the research teams will discuss their methods and results with other teams in their research group. Each research group will then select one individual to give a presentation on his or her research team's hypotheses, study methods, findings, and conclusions, as well as how these differ from those of the other teams in their group. Hypotheses should be proposed for any differences in findings that occurred among teams.

Grading Criteria for Exercise #1: Driver Behavior Study

Title Page

____ APA style: margins and centering, short title and page number, running head, appropriate title, researcher's name, affiliation.

Introduction

____ (Do not use "Introduction" as section heading.) Title of paper is centered at top of page (do not use all caps, do not underline) Introduction includes research problem/question and hypotheses (in the form of "if . . . then")

Method

Participants

Includes number, source (where obtained), and how assigned.

Materials

Description of apparatus and/or materials used.

Procedure

Includes operational definitions of the independent and dependent variables, and detailed, concise description of factors relating to design and execution of experiment, e.g. experimental control.

Results

____ Includes summary statements of data and statistical analyses. Also includes brief reference to data tables and computations (the latter is not usually included in published research), and an overview of the descriptive data, with specific frequencies and percentages, and the inferential data with chi-square results. Was the difference significant for unobtrusive vs. obtrusive observations conditions with male and female data combined, and/or for the males vs. females in the unobtrusive condition or the obtrusive condition?

Discussion

____ Discuss whether the hypotheses were supported? Was the study naturalistic research or an experiment, and why? What, if any, were the experimental independent variables and the correlational variables?

Other

____ Headings and subheadings correct and APA style?

____ Side, top, and bottom margins correct?

____ Appendices: Observation sheets, summary table, and correctly computed statistical analyses attached?

____ Accuracy, completeness, clarity, conciseness, and readability; as well as grammar, punctuation, spelling, etc.

____ **Total Points** (including 100 points for doing the research and writing the paper)

____ **Total Percentage Score** (100 X Total Points/200 possible points = Total Points/2)