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Experimental design terms worksheet answers

A glossary of experimental design terms The aim of this glossary is to define some of the fundamental concepts of research design with which you should be familiar before signing up for your first experiment. Definitions can also be useful for the part of the course that deals with research methods covered in January when we talk about these and other related concepts more thoroughly. Note that an introductory discussion of research-related concepts appears in Chapter 1 of Gleitman's text, pages 13 - 37. See also Gleitman's general glossary of terms, pages B1 - B 25. Hypothesis:... a proposal or assumption that one tries to verify (or reject) through experimentation or observation. An example of a hypothesis might be: Students study more effectively in silence than in noisy environments. Experiment: In an experiment, the experimenter deliberately manipulates one or more variables (factors) in order to determine the effect of this manipulation on another variable (or variables). An example could be measuring the effect of noise level on the memorization performance of subjects in a list of standard nonsense syllables (such as ZUP, PID, WUX, etc.). Independent variable: ... the treatment variable that the hypothesis experimenter has an effect on some other variable. (See Dependent Variable, below). In the example above, the independent variable would be the noise level (in this case with three levels: low, medium, high). In an experiment, the independent variable is manipulated directly by the experimenter. But in an observational study, or when naturalistic observations are used, the independent variable is not directly manipulated by the experimenter, and levels of the independent variable occur naturally and already occur when the study begins. Experimental group and control group: In some experiments, the levels of the independent variable consist only of two: a treatment-present condition and, for comparative purposes, an absent treatment, or without treatment, condition. The receiving group of the present-treatment condition (one of two levels of the independent variable) is called the experimental group, and the group receiving the absent treatment, or without treatment, condition (the other level of the independent variable) is called the control group. Dependent variable: ... the variable that the hypothesis experimenter is affected by, or related to, the independent variable. It is the result or effect variable, usually a measure of the performance of the subjects resulting from changes in the independent variable. In the example above, the dependent variable could be the number of right-thinking syllables recalled correctly. In an experiment, the independent variable is likely not the only variable responsible for the changes observed in the dependent variable. Many other possible variables, such as the time of the mood of the topic, recent news events, or weather, could also affect the results in an experiment. These variables of error, often unnoticed, unknown or without measurement, may be responsible for the variations observed in the dependent variable, even within any group in the experiment in which the level of the independent variable, or treatment, remains constant. Thus, error variables represent all individual differences in the response not specifically accounted for by changes in the independent variable. Error variables must be controlled, for example, by randomization. A particular error variable against the possible effects on the dependent variable are completely consistent with the effects of the independent variable. The presence of a confused variable prevents attributing changes in the dependent variable exclusively to the independent variable. The changes could also be due to the confusion variable. Confusion variables must be controlled by, for example, by randomization or keeping them constant. The effects of a specific and identifiable error variable can be prevented from clouding the results of an experiment by keeping this error variable constant. For example, if all subjects are the same age, variations in age cannot act as an error variable. A variable that, therefore, remains constant is called a control variable. (Of course, one can no longer generalize results to those of ages other than the age selected for the experiment.) The null hypothesis refers to the statement that changes in the independent variable have no effect on the dependent variable and that, therefore, any differences found between experimental and control groups simply occurred by chance through the influence of random error variables. The alternative hypothesis refers to the statement that changes in the independent variable actually have an effect on the dependent variable and that the performance difference between experimental and control groups was greater than expected by chance through only the influence of random error variables. (In the example above, the null hypothesis is that changes in noise level have no effect on subject recovery scores. The alternative hypothesis is that changes in noise levels have an effect on subject recall scores.) Brief: In some experiments, it is not desirable for participants to know the exact nature of the hypothesis being tested. (There is evidence in certain types of experiments that if participants know what the hypothesis is, they could, either consciously or unconsciously, respond in order to try the right hypothesis - or perhaps false! (instead of responding naturally and honestly.) In these experiments, the experimenter is ready to temporarily keep participants in the dark about the hypothesis until after the necessary data Immediately afterwards, however, the experimenter is required to inform participants about the true nature of the hypothesis, why the experiment was designed as it was, and which previous researchers in the relevant areas had found. The experimenter could also ask participants to report how far they saw the experiment and what they thought the experimenter was trying to figure out. (If an experimenter hasn't yet tested other participants in this experiment, your experimenter may ask you to keep the disclosed information in the session confidential until the entire experiment is concluded. Please cooperate with experimenters in this regard.) Page 2 The supervisor. Specialists. We can help you much more effectively when you ask questions, as they arise from one week to the next instead of all at once. Learning Objectives are a great study tool. Good value for money They speak your language. ... Make friends... There are several sources of help and information available to you in this course. It will be up to you to decide when you require help and what form that help should take. Feel free to make use of any of the following sources: 1. Professor Wall Professor Wall is available to answer questions immediately after each of his lectures. In addition, it is available through the PSY100 website, and its normal office hours appear on the first page of this manual. Finally, you can also arrange an appointment with him at a different time than normal office hours by phone (or at the conference). 2. PSY100 Instructors: Lena Paulo Kushnir and Ming Lee An important source of help is individual tutoring, attendance and advice provided by PSY100 instructors at the PSY100 Instruction Center (SS 4042). They are available during the hours given on the office hours page of this manual. Additional assistance can be obtained by phone during these hours and by appointment at other times. You can also contact them through the PSY100 website. PSY100 instructors will help you with a wide range of concerns you may have regarding the course, such as: questions or difficulties with the material in text suggestions to improve the organization of conference notes and to refine your questions about test content on test grading issues and experiment-related issues , participating in experiments and recording experiment participation issues related to test dates (e.g., illness, time conflicts) requests for a makeup test Note that the study is more effective when distributed or spaced with Time. Avoid accumulating all your questions until the day before each test, when we are at our busiest. We can help you much more effectively when you ask questions as they arise week by week. (Of course, if you have questions right before the test, then still ask them.) 3. The PSY100 Manual This manual can help you in several ways. For example, in the following sections it offers useful tips for taking notes, reading and studying in PSY100, tips for answering multiple choice questions and assay, and other information relating to tests, course formatting and grade. Additional Sources of Help and Information a. Psychology Study Guide (for Gleitman text) This pocket study guide, written by J. Jonides and P. Rozin, serves as an accompaniment to the text. Most students will find it useful because it provides materials for review and self-evidence. While this form of assistance isn't equally effective for everyone, we recommend that you at least answer the Learning Goals questions found at the beginning of each chapter. (However, you don't have to rely on the Study Guide as your only means to master the required materials.) B. Learning Advisory and Skills Centre This university service programmes workshops for small groups throughout the year and offers academic and personal advice on note taking, time management, exam study and test anxiety management. It is located in the Koffler Center (416-978-7970). Also note that the Office of Special Services for People with Disabilities (416-978-8060) is also located at the Koffler Center. One of the services provided by this office is to assist students with special needs who require specific accommodation for the drafting of the term tests and the final exam. c. Student organizations The Association of Psychology Students (PSA) is an organization of graduates in Psychology that offers academic and social opportunities for all undergraduate psychology students. The PSA is the main institutional contact between the Department and undergraduate students. The PSA is located on SS 509, on the ground floor. (416-978-6762). The Association of Part-Time Undergraduate Students (APUS), as its name suggests, is especially relevant to part-time students and focuses on serviceing their special needs. It is located on the SS 1089 on the First Floor (416-978-3993). d. Student-generated groups Establishing a friend system through student email or chat and organizing informal group study sessions are excellent ways to review the conference material, engage with others on the course, and get notes for missed lectures. These groups also allow their members to build and then jointly discuss their own essay and multiple choice questions. Apart from the potential to make friends, participation Student-generated groups can be an effective collaborative learning strategy and can help many students achieve their highest grades. There is evidence to suggest student-generated groups or study groups can be at least as effective as formal tutoring groups at work through difficult material. We also encourage these groups to arrange one-off meetings with course staff members. [Next page] [Back to table of contents] The content]