

## Glossary

**a priori specific comparison test** Inferential statistics used to make specific comparisons among some group means when such comparisons are planned in advance of the data collection.

**active control** Procedure in which the control participants receive an established treatment with a known degree of effectiveness.

**alpha ( $\alpha$ ) level** The probability value at which the experimenter decides to reject the null hypothesis and conclude that the independent variable did have an effect on the dependent variable. ; also the probability of falsely rejecting a true  $H_0$ .

**alternate form reliability** Reliability established by administering two different forms of the same test to the same individuals.

**alternative hypothesis ( $H_1$ )** Hypothesis that the independent variable does have an effect on the dependent variable; sample means come from populations with different means.

**attrition** Withdrawal of participants that may be focused on a particular group or participants with particular characteristics.

**baseline** Comparison point established by repeated observations of the natural frequency of the behavior of interest.

**basic research** Research engaged in for the purpose of increasing knowledge of fundamental processes; may have no immediate goals or applications.

**carryover effects** Effects that earlier conditions have on later performance.

**case study** Nonexperimental research technique involving a single individual or a small group of individuals in which observations are made over time (either retrospectively or prospectively).

**ceiling effect** Measurement of the dependent variable results in many very high or highest scores on the dependent variable, thus masking a potential effect of the independent variable.

**census** All elements in a population are included in the study.

**chaos theory** An attempt to understand complex, nonlinear, dynamic systems by using mathematical modeling.

**completely randomized factorial design** Experimental design with two independent variables in which participants are randomly assigned to the different levels of each independent variable.

**concurrent validity** Validity established by comparing scores to a similar test instrument.

**confidence interval** An interval that, with repeated sampling, will include the parameter of interest between its boundaries a specified percentage of the time—for example, the 95% confidence interval.

**confirmation bias** A general tendency to emphasize positive confirming outcomes rather than negative or disconfirming ones.

**confounding variables (confounds)** A type of extraneous variable that acts like an independent variable to create differences among group scores. [AU: DEFINITION OK? OR PROVIDE?]

**construct validity** An instrument is considered to have construct validity if it assists in understanding and predicting operationally defined behavior.

**content validity** Measuring material is drawn directly from the content of the course or training program.

**convenience sampling** The quick, inexpensive, and convenient use of participants who are available at the moment.

**correlated samples** Experimental design in which scores in the groups are clustered into sets.

**correlated samples *t* test** An inferential statistic used to analyze an experiment in which natural pairs, matched pairs, or repeated measures were used to place participants into two treatment conditions.

**correlation coefficient** A number that describes the direction and strength of a relationship between two variables.

**correlational research** Selecting a population and ascertaining the relationship among variables of interest; does not use random assignment or manipulation of conditions.

**counterbalancing** Varying the order of treatment conditions among the participants; used in repeated measures designs to equalize carryover effects among conditions.

**criterion variable** The measure that is predicted by the predictor variable in correlational research.

**critical values** Values that define the region of rejection of  $H_0$  at various levels of  $\alpha$ .

**cross-sectional research** Research that compares preexisting groups that come from portions of a particular dimension; commonly used by developmental psychologists to study the behavioral of individuals from different age groups in order to assess developmental changes.

**debriefing** A statement to participants at the end of a study that reveals the true purpose of the study.

**deception** Research participant is not fully informed about the nature of the study and is often provided misleading information.

**deductive reasoning** The formulation of specific observational predictions based on a general principle or theory.

**demand characteristics** Implicit and explicit cues in the research setting that suggest to the participant that he/she behave in a certain way.

**dependent variable** A measure of behavior that is recorded after the independent variable is introduced.

**determinism** The notion that all events in the universe, including behavior, are the lawful consequence of prior events.

**diffusion of treatment** Details about specific treatments in the experiment become known to participants before they participate.

**direction of control** When two variables (X and Y) are related, it is possible that X causes Y, Y causes X, or that some other variable causes both X and Y.

**double-blind study** When neither the participant nor the experimenter is aware of the conditions in effect.

**duration method of observation** Observer records the period of time during which the target behavior lasts.

- effect size** A statistical measure of the size of the effect of one variable on another variable.
- element** A single member of a population.
- empirical referent** An object, person, or event of which we are capable of having a direct experience.
- empiricism** The use of observational experience as the basis for understanding the past and present and predicting the future.
- ethnography** Nonexperimental research technique to understand the behavior of members of a culture.
- evaluation apprehension** Participants' concerns and apprehensions about being observed and/or evaluated.
- ex post facto design** Nonexperimental research technique in which preexisting groups are compared on some dependent variable.
- exhaustive list** All members of the population appear on the list.
- experimenter bias** Experimenter's knowledge of the experiment influences observations or is unintentionally communicated to participants.
- experimenter characteristics** Personality and physical characteristics of the experimenter that influence the behavior of the participants.
- experimenter expectancies** The behavior desired by the experimenter is unintentionally communicated to the participant.
- external validity** When the findings may generalize from a small sample to a population, from a specific setting to a broader setting, from specific values of the independent variable to a broader range of values, and from one behavioral measure to another.
- face validity** A judgment made after the test is constructed about whether the test instrument appears to measure the content of the course.
- facilitation** An increase of responding when compared to baseline.
- field research** Research conducted in an environment not designed and controlled by the experimenter.
- floor effect** Measurement of the dependent variable results in many very low or lowest scores on the dependent variable, thus masking a potential effect of the independent variable.
- frequency method of observation** Observer counts the number of times that a target behavior occurs within a specified period of time.
- functional relationship** A relationship in which the value of one variable varies with changes in the values of a second variable.
- historical control** Procedure in which the effects of a new treatment are compared to past records of patients who were either untreated or received a different treatment.
- history** Occurrence of a specific event during the course of data collection that influences the behavior of the participants.
- homogeneity of variance** Equal variability in each treatment condition; a statistical assumption of several parametric statistical analyses.

**hypothesis** A prediction of what the relationship will be between one variable and another variable.

**independent observation** When the observations of one observer do not influence the observations of another observer.

**independent samples** Experimental design in which participants are randomly assigned to the different treatment conditions.

**independent samples *t* test** An inferential statistic used to analyze an experiment in which random assignment was used to place participants into two treatment groups; can also be used to analyze ex post facto research with two preexisting groups.

**independent variable** A variable under the control of and administered by the experimenter.

**inductive reasoning** - Formulation of a general principle or theory based on a set of specific observations.

**informed consent** - Individual agrees to be a research participant after being informed of the nature of the study.

**Institutional Review Board (IRB)** - Committee of persons from the institution and from the community that grants ethics approval to research proposals involving human participants.

**instructions** - Information given to participants that enables them to perform the required task; must be clear and consistent to ensure task does not vary.

**instrument** An established questionnaire that has known validity and reliability.

**instrumentation** The methods used to record observations; may change or deteriorate over time.

**interaction** The effect of one variable depends on the level of another variable.

**internal validity** When the independent variable is responsible for observed variations in the dependent variable.

**interobserver agreement** The degree to which the data scorings by independent observers of the same target behavior agree.

**interparticipant replication** Replication with a different participant or participants.

**interval method of observation** Observer records whether or not a target behavior is occurring at specified equal time intervals.

**interval scale** A quantitative scale expressing "how much"; does not have a true zero point.

**interview** One-to-one interaction with a research participant in which questions are prepared but flexibility is available to clarify and enhance data collection.

**intraparticipant replication** Replication within the same participant.

**inventory** - An established questionnaire that has known validity and reliability.

**irreversible behavior** When behavior does not return to baseline after treatment is withdrawn.

**laboratory research** Research conducted in an environment designed and controlled by the experimenter.

**longitudinal research** Repeated testing of the same individuals over a substantial time span, usually years.

**main effect** An effect of one variable found over all levels of a second variable.

**matched pairs** Correlated samples design in which scores in the groups are clustered into sets because the experimenter matches participants on some variable.

- matching** Pairing participants according to their similarity on a predictor variable.
- maturation** Changes in the state of participants over time that influence their behavior.
- mean** Measure of central tendency obtained by summing all the scores and dividing by the number of scores.
- measure of central tendency** Measure that describes the center of a distribution of scores.
- measure of variability** Measure that describes the extent of the dispersion of scores.
- measurement** The process of assigning numbers to objects and events in accordance with a set of rules.
- median** The middle score in a distribution of scores; half the scores are above the median, and half are below.
- meta-analysis** A statistical technique that provides an indication of the size of an effect across the results of multiple studies.
- mixed factorial design** Experimental design with two independent variables in which participants are randomly assigned to different levels of one independent variable and participate in all levels of the other independent variable.
- mode** The most frequent score in a distribution.
- monotonic relationship** A consistent relationship between two variables such that as the values of one variable increase, the values of the other variable always increase (or always decrease)
- multiple baseline procedure** Intraparticipant replication with different and independent (uncorrelated) responses.
- natural pairs** Correlated samples design in which the scores in the groups are clustered into sets for a natural reason (e.g., twin studies).
- naturalistic observation** Correlational or ex post facto design that takes place in a “real-world” setting.
- nominal scale** A scale in which numbers are assigned to objects or events for identification purposes.
- nonmonotonic relationship** A relationship between two variables such that as the values of one variable increase, the values of the other variable increase at times and decrease at other times.
- nonparametric statistics** Inferential statistics used with nominal or ordinal data or when certain assumptions for parametric analysis are not met (e.g., Wilcoxon *t*, Mann–Whitney, chi-square).
- nonparticipant observation** Investigators do not interact with the participants during times of observation.
- nonprobability sampling** There is no way of estimating the probability that an element will be included in the sample.
- nonreactive measures** Observations of behavior made without the person’s being aware that he or she is being observed.
- null hypothesis ( $H_0$ )** The hypothesis that the independent variable has no effect on the dependent variable; sample means come from populations with the same mean.
- observer drift** A gradual shift in the observational criteria during the course of the research.

- one-way correlated samples ANOVA** An inferential statistic used to analyze an experiment in which natural pairs, matched pairs, or repeated measures were used to place participants into two or more treatment conditions.
- one-way independent samples ANOVA** An inferential statistic used to analyze an experiment in which random assignment was used to place participants into two or more treatment groups.
- operational definition** Defining a term or concept by the way in which it is measured—that is, making the term observable.
- optimal baseline** When the baseline behavior shows little change from session to session.
- ordinal scale** A scale in which numbers represent rank order (greater than, less than) without equal intervals.
- parametric statistics** Inferential statistics used with interval or ratio data and when certain assumptions are met (e.g., *t* test, ANOVA).
- participant observation** Investigators interact with participants during times of observation.
- percentage agreement among observers** A method for measuring the reliability of observations.
- phenomenology** Nonexperimental research technique in which in-depth interviews provide insight into the experiences of an individual or a group of individuals.
- placebo control** Procedure in which the control participants believe that they receive an effective treatment when in fact they do not.
- plagiarism** Taking the ideas or words of someone else and representing them as yours.
- population** All members that meet a specified criterion; all measurements meeting a set of specifications.
- post hoc specific comparison test** Inferential statistics used to make specific comparisons among group means when there are more than two groups and the ANOVA is significant (e.g., Tukey HSD, Bonferroni test, Scheffé test).
- power** The probability of correctly rejecting a false null hypothesis.
- predictive validity** Validity established by how well the test predicts relevant aspects of behavior.
- predictor variable** The measure that is used to predict the criterion variable in correlational research.
- probability sampling** A researcher can specify the probability that an element will be included in the sample.
- qualitative research** Nonexperimental research that describes and interprets observations but does not seek to quantify observations numerically.
- qualitative variable** A variable that differs in kind rather than in amount.
- quantitative variable** A variable that differs in quantity or amount.
- quasi-experiment** Similar to a true experiment except that random assignment of participants is not used.
- questionnaire** A set of questions designed to measure facts, opinions, and attitudes from a large sample of individuals.
- quota sampling** When lists are not available, interviewers are assigned a starting point, a specified direction, and a goal of meeting quotas of various subsets of the population.

**random assignment** Assigning participants to each experimental condition in such a way that any given participant is as likely to be assigned to one condition as another.

**random error** The operation of extraneous variables in a chance manner to increase variability of scores within groups.

**random sampling** Selecting samples in such a way that each sample of a given size has the same probability of being selected; each element in the population has an equal chance of being selected.

**random sampling error** A sample is biased (does not accurately represent the intended population) simply due to chance.

**range** Measure of variability defined as the difference between the highest and lowest scores in a distribution.

**ratio scale** A scale with the properties of an interval scale but with a true zero, so that ratios between quantities can be expressed.

**rationalism** The use of reason and logic as the basis for knowledge.

**reactive measures** Observations of behavior made with the person aware that he or she is being observed.

**reductionist** A person who seeks to explain complex phenomena in terms of relatively simple and basic building blocks.

**region of rejection** Portion of the area under a curve that includes values of a test statistic that lead to a rejection of  $H_0$ .

**regression to the mean** Individuals high or low on one testing are found to be closer to (regress toward) the mean on a subsequent testing.

**reliability** The consistency of the measuring instrument.

**reliability coefficient** A statistic that measures the reliability of observations.

**repeated measures** Correlated samples design in which scores in the groups are clustered into sets because the same participants participate in all conditions.

**repeated measures factorial design** Experimental design with two independent variables in which the same participants participate in all conditions.

**replication** An independent repetition of an experimental procedure under as similar conditions as the experimental materials permit.

**reversible behavior** When behavior returns to baseline after treatment is withdrawn.

**sample** A subset of a population.

**sampling distribution** A theoretical probability distribution of possible values of some sample statistic that would occur if we were to draw all possible samples of a fixed size from a given population.

**sampling error** The fact that samples drawn from the same population will rarely provide identical estimates of the population parameter of interest.

**selection** Behavioral observations are affected by the particular participants chosen for the study or the particular participants assigned to the treatment conditions.

**simple effect** An effect of one independent variable is not found over all levels of a second independent variable.

**single-blind study** Only the participant is unaware of the condition to which he or she is being exposed.

**split-half reliability** Reliability established by comparing responses to half the questions on a test with responses on the other half of the same test.

**standard deviation** The square root of the variance; on average, how far scores are from the mean.

**stratified random sample** Random samples are selected from different strata or subgroups of the population.

**suppression** A decrease of responding when compared to baseline levels.

**survey** Using an interview, questionnaire, or inventory in an attempt to estimate opinions, attitudes, and characteristics of a population based on a sample.

**systematic error (confounding)** Intermixing of effects of extraneous variables with possible effects of the independent variable; variability in scores between groups that is the result of variables other than the independent variable.

**systematic observation** Observations planned and prepared in advance, including control over conditions under which the observations are made.

**systematic sampling error** A sample is biased because it was not properly drawn by the researcher.

**systematic variance** Variability in scores between groups that is the result of the manipulation of the independent variable.

**task** Behavioral observations are affected if what participants are asked to do is not the same for all groups or conditions.

**tautological (circular) reasoning** Using a definition as an explanation, thus reasoning in a circle—for example, they are fighting because they are hostile; I know they are hostile because they are fighting.

**test–retest reliability** Reliability established by administering the same test twice to the same individuals.

**testing effects** Behavioral observations during subsequent testing are affected by prior testing or observational experiences in the study.

**theory** A system of ideas or a set of principles, often dealing with mechanisms or underlying reasons for behavior, that help us organize and assimilate the empirical relationships (observations) that we discover.

**third variable** The variable that actually causes changes in two variables (X and Y) and that explains the relationship between X and Y.

**time-series design** Repeated measurements of the dependent variable over time with an introduction of the independent variable at a particular point in time.

**transient effects** Short-term effects of prior conditions, such as fatigue or boredom.

**Type I error** An error made when  $H_0$  is true but is mistakenly rejected.

**Type II error** An error made when  $H_0$  is actually false but is not rejected.

**unobtrusive measures** Measures recorded from individuals without their awareness.

**validity** A valid instrument measures what it purports to measure.



**variable** A condition that can vary or change in quantity or quality.

**variance** Measure of variability based on the squared deviations of scores from the mean.

**yoked control** Procedure in which two participants are simultaneously exposed to the same condition but the behavior of only one participant determines exposure to the treatment.