

"Canonical Correlations" and Other Mystifying Research Terms

Researchers, like other professionals, often get caught up in their own lingo, forgetting that by doing so they exclude much of their potential audience.

This article attempts to demystify some of the more common terms used to report research findings.

- **applied research** Research aimed at solving practical problems. For example, auto mechanics do applied research, in a sense, when they perform tests to determine the cause of the "clunkitty-clunk" in your car.
- **variable** Any factor or characteristic that can take on different values (e.g., one's stress level). Research is aimed at defining the relationship between variables, for example, between one's level of stress and the height of one's in-basket.
- **dependent variable** The variable that is measured in an experiment, for example, stress level. The dependent variable is thought to be affected by the independent variable.
- **independent variable** Any variable in research that is thought to affect the dependent variable. For example, the number of times one is put on "hold" in a day (the independent variable) may affect one's stress level (the dependent variable).
- **experimental design** A structured study wherein subjects are assigned randomly without bias to groups or conditions, and all appropriate control procedures are used. The researcher controls the experiment, to try to ensure that unusual events do not affect the results.
- **experimental group** A group that is subjected to particular conditions in an experiment. The experimental group is usually compared with a control group. In a study of the effectiveness of a particular medical treatment, for example, the experimental group is subjected to the treatment.
- **control group** A group of subjects used as a standard against which the experimental group is compared. The ideal control group is similar to the experimental group on all variables except that it is not subjected to the experimental treatment. Using the above example of the treatment-effectiveness study, the control group would have the same characteristics as the experimental group except that its members would not receive the treatment being studied.
- **individual differences** Natural differences between people on any variable. Individual differences between people on a dependent measure tend to obscure the effects of an independent variable on that measure. For example, individuals' different abilities to cope with potentially stressful factors would obscure the effects that the height of the in-basket alone would have on their stress levels.
- **random sampling** An unbiased procedure used to select subjects to be included in a study where each member of the population has an equal chance of being selected. One method of random selection is to draw names from a hat.
- **representative sample** A sample of subjects that adequately reflects the characteristics of the total population that the study is describing. For example, since it would be too time-consuming to survey every correctional staff member, a smaller number may be chosen to represent all correctional staff. The sample is representative of the whole population of correctional staff if its characteristics (e.g., age, gender, years of experience) are similar to those of the population.
- **central tendency** The average, or typical, score in a distribution (group of scores). Three measures of central tendency are the mean, median and mode.
- **mean** The most common measure of central tendency. It is the arithmetic average of scores,

calculated by adding a set of measurements and then dividing by the number of measurements in the set. If the distribution of scores was "1, 1, 2, 3, 3, 4, 4, 4, 5," the mean would be 3 (the total score of 27 divided by the number of scores, 9).

- **median** The middle score in a distribution. For the distribution described above, the median would be 3 - half the scores fall above it and half fall below it.
- **mode** The most frequent score in a distribution. The mode for the above distribution is 4.
- **causally related** Two variables are causally related if a change in one variable results in a predictable change in the other, and this change occurs as a direct result of the change in the first variable.
- **correlation** The degree of relationship between two or more variables. A correlation coefficient (a measure of the strength of a correlation) ranges from +1.00 to -1.00.
- **perfect correlation** A correlation of +1.00 (perfect positive correlation) or -1.00 (perfect negative correlation). When two variables are perfectly correlated, knowing the score on one variable allows you to predict the exact score on the other.
- **positive correlation** A relationship between two variables where one variable increases as the other variable increases. To use the original example again, the height of an individual's in-basket and his or her level of stress may be positively correlated: as one increases, so does the other.
- **negative correlation** A relationship between two variables where one variable increases as the other variable decreases. Some believe that the rate of inflation and their bank balance are negatively correlated.
- **confounding variable** An uncontrolled variable that intrudes on the relationship between the variables being measured. This "intrusion" makes it difficult to discern which variable is having an effect on the dependent variable. A confounding variable in the stress/in-basket example might be a sudden and dramatic change in some individuals' physical work environment.
- **generalizability** The extent to which the findings of a research study are applicable to the outside world. The question is, "If I did this study in the real world, outside my nice laboratory, would I get the same results?"
- **reliability** An index of the consistency of a measuring instrument in repeatedly providing the same score for a given subject. The question here is, "If I gave my subjects the same test next week, would I get the same results?"
- **validity** In a general sense, validity refers to the methodological or conceptual soundness of research. In the case of an experiment, a question regarding validity is "Does this experiment really test what it is supposed to test?"

Source of definitions: Anthony M. Graziano and Michael L. Raulin, *Research Methods: A Process of Inquiry*. New York: Harper & Row, 1989.