

## Types of Variables

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Binary variable	Observations (i.e., dependent variables) that occur in one of two possible states, often labelled zero and one. E.g., “improved/not improved” and “completed task/failed to complete task.”
Categorical Variable	Usually an independent or predictor variable that contains values indicating membership in one of several possible categories. E.g., gender (male or female), marital status (married, single, divorced, widowed). The categories are often assigned numerical values used as labels, e.g., 0 = male; 1 = female. Synonym for nominal variable.
Confounding variable	A variable that obscures the effects of another variable. If one elementary reading teacher used a phonics textbook in her class and another instructor used a whole language textbook in his class, and students in the two classes were given achievement tests to see how well they read, the independent variables (teacher effectiveness and textbooks) would be confounded. There is no way to determine if differences in reading between the two classes were caused by either or both of the independent variables.
Continuous variable	A variable that is not restricted to particular values (other than limited by the accuracy of the measuring instrument). E.g., reaction time, neuroticism, IQ. Equal size intervals on different parts of the scale are assumed, if not demonstrated. Synonym for interval variable.
Control variable	An extraneous variable that an investigator does not wish to examine in a study. Thus the investigator controls this variable. Also called a covariate.
Criterion variable	The presumed effect in a nonexperimental study.
Dependent variable	The presumed effect in an experimental study. The values of the dependent variable depend upon another variable, the independent variable. Strictly speaking, “dependent variable” should not be used when writing about nonexperimental designs.
Dichotomous variable	Synonym for binary variable
Discrete variable	Variable having only integer values. For example, number of trials need by a student to learn a memorization task.

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Dummy Variables	<p>Created by recoding categorial variables that have more than two categories into a series of binary variables. E.g., Marital status, if originally labelled 1=married, 2=single, and 3=divorced, widowed, or separated, could be redefined in terms of two variables as follows: var_1: 1=single, 0=otherwise. Var_2: 1=divorced, widowed, or separated, 0=otherwise.</p> <p>For a married person, both var_1 and var_2 would be zero. In general, a categorical variable with <math>k</math> categories would be recoded in terms of <math>k - 1</math> dummy variables. Dummy variables are used in regression analysis to avoid the unreasonable assumption that the original numerical codes for the categories, i.e., the values 1, 2, ..., <math>k</math>, correspond to an interval scale. Use: to place cases in specific groups.</p>
Endogenous variable	A variable that is an inherent part of the system being studied and that is determined from within the system. A variable that is caused by other variables in a causal system.
Exogenous variable	A variable entering from and determined from outside of the system being studied. A causal system says nothing about its exogenous variables.
Independent variable	The presumed cause in an experimental study. All other variables that may impact the dependent variable are controlled. The values of the independent variable are under experimenter control. Strictly speaking, "independent variable" should not be used when writing about nonexperimental designs.
Interval variable	Synonym for continuous variable
Intervening variable	A variable that explains a relation or provides a causal link between other variables. Also called by some authors "mediating variable" or "intermediary variable." Example: The statistical association between income and longevity needs to be explained because just having money does not make one live longer. Other variables intervene between money and long life. People with high incomes tend to have better medical care than those with low incomes. Medical care is an intervening variable. It mediates the relation between income and longevity.
Latent variable	An underlying variable that cannot be observed. It is hypothesized to exist in order to explain other variables, such as specific behaviors, that can be observed. Example: if we observe the voting records of members of the House of Representatives on spending bills for the military, foodstamps, law enforcement, and promoting business investment, we might find underlying patterns that could be explained by postulating latent variables such as conservatism and liberalism.

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Manifest variable	An observed variable assumed to indicate the presence of a latent variable. Also known as an indicator variable. We cannot observe intelligence directly, for it is a latent variable. We can look at indicators such as vocabulary size, success in one's occupation, IQ test score, ability to play complicated games (e.g., bridge) well, writing ability, and so on.
Manipulated variable	Synonym for independent variable.
Mediating variable	Synonym for intervening variable. Example: Parents transmit their social status to their children directly, but they also do so indirectly, through education: viz. Parent's status → child's education → child's status
Moderating variable	A variable that influences, or moderates, the relation between two other variables and thus produces an interaction effect.
Nominal variable	Synonym for categorical variable.
Ordinal variable	A variable used to rank a sample of individuals with respect to some characteristics, but differences (i.e., intervals) and different points of the scale are not necessarily equivalent. Examples: anxiety might be rated on a scale "none," "mild," "moderate," and "severe," with numerical values of 0, 1, 2, 3. A patient with an anxiety score of 1 is ranked as less anxious than a patient with a score of 3, but patients with scores 0 and 2 do not necessarily have the same differences in anxiety as patients with scores of 1 and 3.
Outcome variable	The presumed effect in a nonexperimental study. Synonym for criterion variable.
Polychotomous variables	Variables that can have more than two possible values. Strictly speaking, this includes all but binary variables. The usual reference is to categorical variables with more than two categories.
Predictor variable	The presumed "cause" on a nonexperimental study. Often used in correlational studies. For example, SAT scores predict first semester GPA. The SAT score is the predictor variable.
Treatment variable	Synonym for independent variable

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