

Types of Data

Below is a summary of the main differences between quantitative and qualitative data. If you have any questions or require language or publishing support, please email global@edanzgroup.com.

	Quantitative data	Qualitative data
Definitions	Data that are measurable numerical values	Data that can be observed but not measured
	Data that can be mathematically transformed and statistically analyzed to show trends and associations	Data that describe situations, properties, and characteristics; data commonly provide insight and in-depth understanding of people's lived experiences
	Whether single variables (one type of observation) or multiple variables (more than one type) are measured is decided before the study	Can be analyzed as themes and subthemes (content analysis) or types of language used such as words/pauses/sounds/gestures, intentions, and interactions between participants (discourse analysis, conversation analysis); coding and scoring systems may be decided before the study
	Commonly obtained in hypothesis-testing papers	Commonly obtained in hypothesis-generating studies
Types	Discrete (whole numbers) or continuous (scale can be subdivided) data from surveys, interviews, observations, experiments	Spoken/written/visual/audio (pictorial, textual, sound) data from structured or semi-structured questionnaires, interviews, observations, group discussions, literature/diaries/newspapers, artifacts/objects
	Can be grouped into dichotomous nominal categories (eg, present/absent) or ordinal categories (eg, ranked quantities/scores or groups)	Can be classified into nominal categories (properties of equal hierarchy, eg, colors, pets) or ordinal categories (can be ordered, eg, comfort level, satisfaction level, agree/neutral/disagree)
	Can be parametric, with parameters/constants that can characterize and identify the distribution (eg, Normal distribution, with mean and standard deviation), or nonparametric, meaning without a predictable distribution type (eg, non-Normal distribution, with median and range). These data are analyzed statistically by parametric and nonparametric tests, respectively	Can come from exploratory, small-scale focused studies; can aim to show commonalities, consensus, as well as variation. Two or more categorical variables can be statistically tested by the chi-square test
Examples	Discrete: counts of people, number of family members	Data can be frequency counts: Hair color, eye color, sex/gender, race or ethnicity, nationality, species, types of

	Continuous: Height, weight, temperature, humidity, pressure, distance, time, volume, concentration, area, angles (can be classified as ordinal categories [low, medium, high, or increasing ranges of values] or nominal categories [old/young, high/low, hot/cold])	punctuation used, car type, names (of sports, disease type, possible risk factors, location)
	Can be different types of the same unit (eg, for money, the variable could be personal income, family income, disposable income)	Data can be quotes: Reasons for doing or not doing something; attitudes, beliefs, motivations, perceptions, rationales; qualities and descriptions of something (texture, smell)
Summary statistics	Quantitative data <i>Examples</i>	Qualitative data <i>Examples</i>
Counts	Numbers of households in a town	How many have pets of different types
Percentages	Percentage of households of married people	Percentage of households with at least one dog, or percentage with any pet
Mean (average value)	Mean age or number of people in a household	Mean level of how much people in a household like pets (conversion to numerical data needed)
Median (central value after ordering data)	Median age or number of people in a household	Median level of how much people in a household like pets (conversion to ordered numerical data needed)
Mode (most frequent value)	Modal age or number of people in a household	Most common name for a pet; most common type of pet