

Understanding Levels of Measurement

By [Tariq Ahmad](#)

We gather knowledge through observation and when we collect enough observations we form concepts. The process of connecting observations to concepts is known as operationalization. Specifying what we mean when we use certain terms is referred to as conceptualization. Survey research involves a systematic measurement of observations in order to come up with conclusions that lead to concepts. When we observe objects we understand them in terms of attributes. These attributes may vary from object to object. For example if hair is the object then the color would be the attribute. A variable is understood as a value that changes and is therefore a logical grouping of attributes. You can classify every observation in terms of one and only one attribute. You can not call hair both blond and red but you could call blondish red hair sandy. The response options we allow survey respondents make a difference in the survey data we collect. Given the option of classifying blondish red hair either blond or red there will be some that classify it as red and others that classify it as blond. A neutral response option or allowing your survey respondent to decide the degree to which hair is either blond or red will give you better data to base your conclusions on.

Furthermore, variables represent separate dimensions of concepts. A dimension can be understood as different aspects or facets of a concept. The variable of gender consists of two attributes, male and female. Once the variable has been defined by one of those attributes then the only the variable involved in determining the concept of gender would be gender. However, a concept such as socioeconomic status is defined by multiple variables. When determining a person's socioeconomic status we look at variables such as income, education, and occupational prestige. Any one of which can change. When coming to conclusions in survey research we must account for all the variables that go into determining a particular concept.

These variables can be numerical or classificatory. When we understand a variable's level of measurement we have a better understanding of how variables vary and can therefore understand what we have just measured more fully. The relationship of the values assigned to attributes is referred to in terms of levels of measurement. Knowing the level of measurement helps you to decide how to interpret the data collected for a variable. They determine the level of mathematical precision with which the values of a variable can be expressed. The nominal level of measurement is qualitative and has no mathematical interpretation. The quantitative levels of measurement - ordinal, interval, and ratio - are progressively more mathematically precise as you move along the levels.

Nominal Scale

When variables have values that have no mathematical interpretation they differ in kind or quality but not in amount. This measure offers names or labels for characteristics. At this level data can be placed into categories and counted only in regard to frequency of occurrence. There is no ordering or valuation implied. When we talk about hair color we are referring to measurement on a nominal scale but no valuation is implied with any of the possible responses.

Ordinal Scale

When variables can logically be ranked ordered from greatest to least. For example, in a customer satisfaction survey you may ask a client if they are "very satisfied", "satisfied", "dissatisfied", or "very dissatisfied." A customer that responds "very satisfied" is more satisfied than one that marks "dissatisfied" but you can not quantify this as being 2 units more satisfied. The interval between values can not be interpreted. On this level measurement provides information about the order of categories but does not indicate the magnitude of differences between them.

Interval Scale

At the interval level numbers represent fixed measurement units but have no true zero point. However, the distance between numbers does have meaning. A temperature zero degrees does not signify an absence of temperature any more than zero AD does not signify an absence of time. This provides still more meaningful information about a variable. It labels, orders, and uses consistent units of measurement to indicate the exact value of each category of response.

Ratio Scale

This is based on a true zero point and you can measure how much more one attribute is to another. On the ratio level we can say that 10 is two times as much as 5 and 10 is 5 more than 5. Because numbers have a zero point they can be added, subtracted, multiplied, and divided in a meaningful way.

As you progress up each level of measurement the measurement includes all the qualities below it and adds something new. When applicable it is preferable to measure survey data that uses a higher level of measurement (interval, ratio) than a lower one (nominal, ordinal).

Tariq is a copywriter focusing on email marketing and survey software with ActiveCampaign - a leading web based software company with solutions including [email marketing](#), [survey software](#), and other marketing & customer service applications.

Article Source: http://EzineArticles.com/?expert=Tariq_Ahmad



Google™ Custom Search

Search

Tariq Ahmad

Basic PLUS Author | 18 Articles

Joined: October 1, 2008

Was this article helpful? 1 0



Did you find this article helpful? 1 0

