MIHÁLY FÓNAI PHD – ÉVA HUSZTI PHD: GENERAL RESEARCH METHOD

Types of reserarch, groups of research methods and structure of researches

Contents

- Types of researches: basic research, applied researches and action research.
- The logic of research, the inductive and the deductive logic, their characteristics and their effect on the structure of research.
- Correlations between types of logic of researches and type of researches.
- The main features of qualitative and quantitative research methods and their scope of application.
- The steps of social science researches from problem definition to publication of results.

Motivations for Research – 1. Babbie, 1989)

Testing Formal Theories

Some social research flows from the derivation of formal theories.

Eg. Talcott Parsons, „general theory of action" (Parsons spoke of universalistic versus particuraristic *orientations* that applied to different social roles and situations).

The testing: Suppose you were a police officer on patrol late one night and discovered your own child breaking into a store. Your role as police officer calls for an universalistic response, whereas the parent in you struggles toward particularism.

(Testing formal theories - we use this way of research, if our research is deductive → 17. slide)

The step of this researches in deductive logic:

- analysing of theories (eg. Parsons's „general theory of action")
- hypotheses
- observation or measurement
- testing of hypotheses by our results)

Motivations for Research - 2. (Babbie, 1989)

Exploring Unstructured Interests

Quite often, a scientist will take an interest in a topic without having any clear ideas about what to expect in the way of relationships among variables.

Initially, the relevant variables are not even clear. The initial research, in fact, may have the identification of important variables as its primary purpose.

(eg. exploratory researches, there no is enough knowledge on some problem, question, topic, or researcher is not enough informed in some topic)

Motivations for Research – 3. Babbie, 1989)

Applied Research

Which increasing frequency, social researchers are being commissioned to engage in specific research project, usually of an applied nature.

Eg.: a city government may commission a survey of unemployment rates; a business firm may commission an evaluation of its new apprenticeship program; a political aspirant may commission a poll of voters.

From a social researcher's point of view, applied research can be a source of income, but it also can opportunity to add to general scientific knowledge.

At times there has been a tendency for social scientist in colleges and universities to look down on applied research as less intellectually respectable than "pure" research – sometimes described as "knowledge for knowledge's sake.

Attention: to hold ethical norms of researches

Motivations for Research – 4. Babbie, 1989)

Involuntary Research

Which is the involuntary research? In that the researchers undertake it as a result of external pressure to do so.

There are two major category of this phenomenon:

- junior faculty members whose professional security or advancement may depend, in part, on scientific publications
- college students who must undertake research to satisfy the requirements of courses (in research methods)

The purposes of researches (Babbie, 1989)

Exploration: some research is conducted to explore a topic, that is, to start familiarize a researcher with that topic. This approach typically occurs when a researcher examines a new interest or when the subject of study itself is relatively new → **exploratory research**

Description: A major purpose of many social science studies to describe situations and events. The researcher observes and then describes what was observed. (It can be used when any problem is known after exploration! the researchers do a lot of description investigations to know better the observed phenomena) → **descriptive research**

Explanation: The third general purpose of social science research is to explain things. Descriptive studies answer questions of what, where, when, and how; explanatory questions, of why (we can analyse and explain the contexts in these researches) → **explanatory research**

Types of researches – 1. (Wikipedia)

- **Basic research**, also called ***pure research*** or ***fundamental research,*** has the scientific research aim to improve scientific theories for improved understanding or prediction of natural or other phenomena.
- Basic research advances fundamental knowledge about the world. It focuses on creating and refuting or supporting theories that explain observed phenomena. Pure research is the source of most new scientific ideas and ways of thinking about the world. It can be exploratory, descriptive, or explanatory; however, explanatory research is the most common.
- Basic research generates new ideas, principles, and theories, which may not be immediately utilized but nonetheless form the basis of progress and development in different fields. Today's computers, for example, could not exist without research in pure mathematics conducted over a century ago, for which there was no known practical application at the time. Basic research rarely helps practitioners directly with their everyday concerns; nevertheless, it stimulates new ways of thinking that have the potential to revolutionize and dramatically improve how practitioners deal with a problem in the future.

Types of researches – 2. (Wikipedia)

Applied research, in turn, uses scientific theories to develop technology or techniques to intervene and *alter* natural or other phenomena. Though often driven by curiosity, basic research fuels applied science's innovations.

Applied research is the practical application of science. It accesses and uses accumulated theories, knowledge, methods, and techniques, for a specific, state-, business-, or client-driven purpose. Applied research is contrasted with pure research (basic research) in discussion about research ideals, methodologies, programs, and projects.

Applied research deals with solving practical problems and generally employs empirical methodologies. Because applied research resides in the messy real world, strict research protocols may need to be relaxed. For example, it may be impossible to use a random sample. Thus, transparency in the methodology is crucial. Implications for interpretation of results brought about by relaxing an otherwise strict canon of methodology should also be considered.

Since applied research has a provisional close-to-the-problem and close-to-the-data orientation, it may also use a more provisional conceptual framework such as working hypotheses or pillar questions.

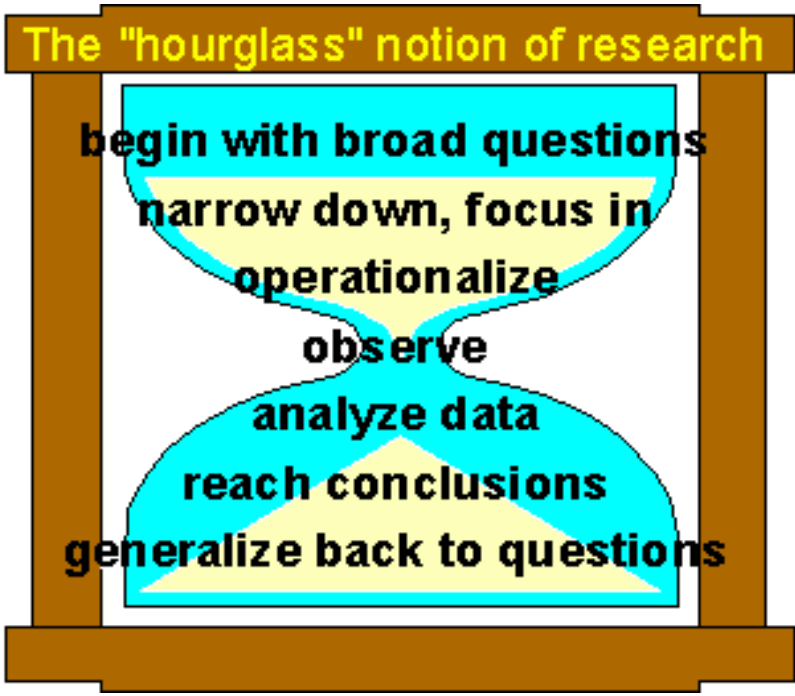
Types of researches – 3. (Wikipedia)

- **Action research** is either research initiated to solve an immediate problem or a reflective process of progressive problem solving led by individuals working with others in teams or as part of a "community of practice" to improve the way they address issues and solve problems. There are two types of action research: participatory and practical. Denscombe writes that an action research strategy's purpose is to solve a particular problem and to produce guidelines for effective practices.
- Action research involves actively participating in a change situation, often via an existing organization, whilst simultaneously conducting research. Action research can also be undertaken by larger organizations or institutions, assisted or guided by professional researchers, with the aim of improving their strategies, practices and knowledge of the environments within which they practice. As designers and stakeholders, researchers work with others to propose a new course of action to help their community improve its work practices.

Philosophy of research (deduction, induction, validity)

Structure of Research

1. step - the research process usually *starts with a broad area of interest, the initial problem that the researcher wishes to study. (Research Problem)*
2. step - *the researcher has to narrow the question down* to one that can reasonably be studied in a research project. *Making hypothesis or a focus question.* (Research Question)
3. step - *the researcher is engaged in direct measurement or observation of the question of interest.*
4. step - once the basic data is collected, *the researcher begins to try to understand it, usually by analyzing it in a variety of ways*. Even for a single hypothesis there are a number of analyses a researcher might typically conduct.
5. *step - the researcher begins to formulate some initial conclusions*
6. step - *finally, the researcher often will attempt to address the original broad question of interest* by generalizing from the results of this specific study to other related situations.



The basic components of a Study

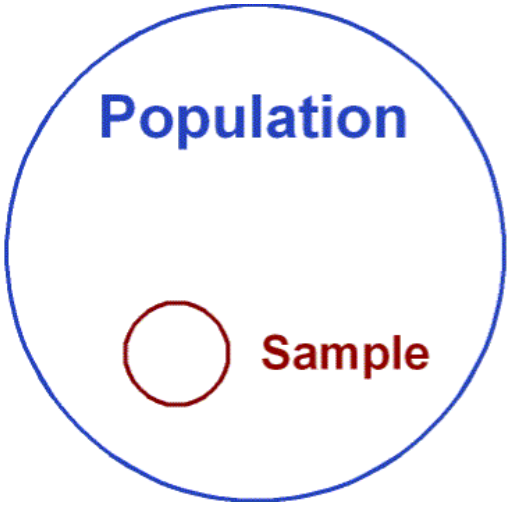
- The Research Problem (…)
- The Research Question (…)
- The Program (Cause) (…)
- The Units (…)
- The Outcomes (Effect) (…)
- The Design (…)

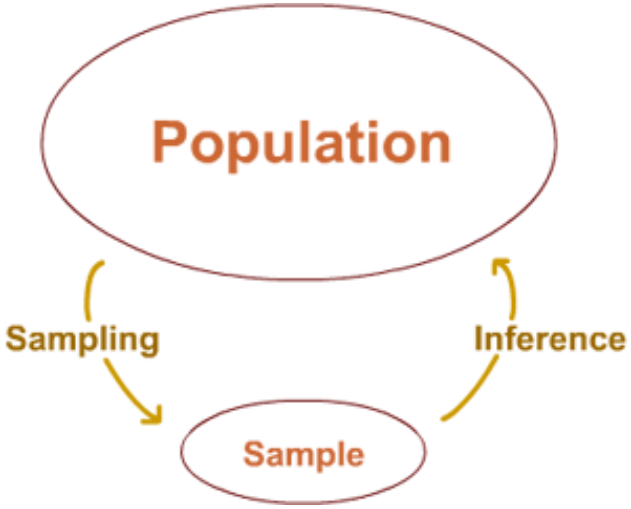
Structure of social research 1.

- Most social research originates from some general **problem** or question. Usually, the problem is broad enough that you could not hope to address it adequately in a single research study.
- Researcher should narrow the problem down to a more specific **research question**. The research question is often stated in the context of some theory that has been advanced to address the problem.
- The problem with such a question is that it is still too general to be studied directly. Consequently, *in most research we develop an even more specific statement, called hypotheses* that describes in *operational* terms exactly what we think will happen in the study.
- Social research is always conducted in a social context. We ask people questions, or observe them or measure the opinions of people.
- An important component of a research project is *the units* that participate in the project. Units are directly related to the question of sampling.

Structure of social research 2.

- *Sampling is the process of selecting units* (e.g., people, organizations) from a population of interest so that by studying the sample we may fairly generalize our results back to the population from which they were chosen.
- *When sampling, we make a distinction between the theoretical population of interest to our study and the final sample that we actually measure in our study.* Usually the term "units" refers to the *people* that we sample and from whom we gather information.
- In causal studies, we are interested in the effects of some cause on one or more **outcomes**. The outcomes are directly related to the research problem.
- *Finally, in a causal study we usually are comparing the effects of our cause of interest relative to other conditions.*
- A design is used to structure the research, to show how all of the major parts of the research project work together to try to address the central research questions.

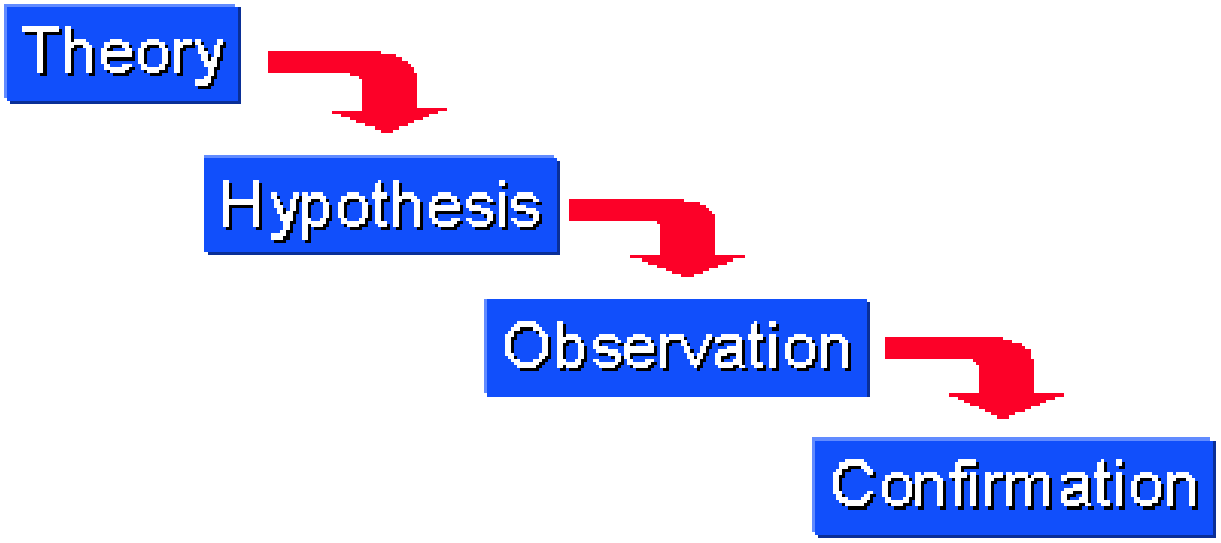




How can we create research problems?
Deduction & Induction

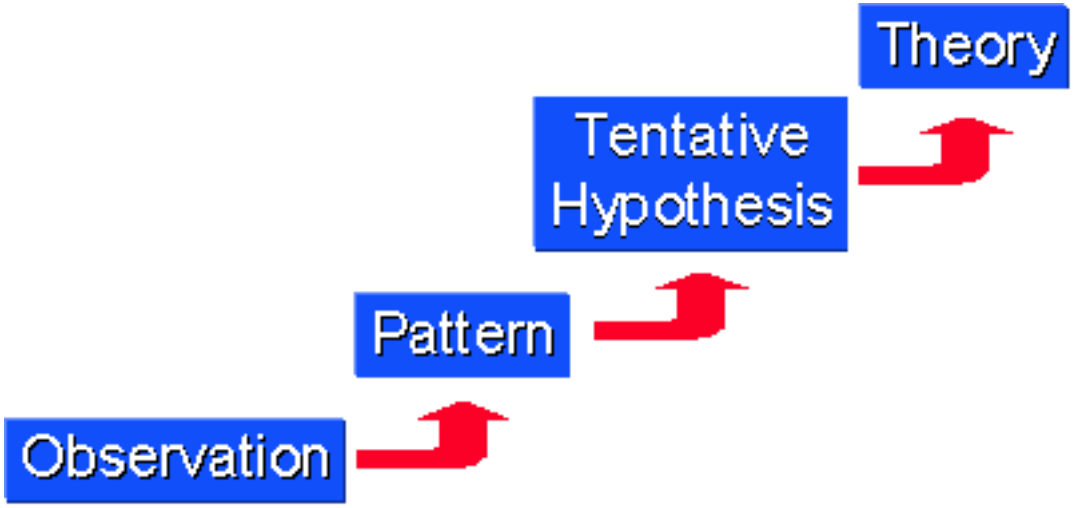
Deductive approach works from the more general to the more specific. ('top-down' approach)

We begin with thinking up a *theory* about our topic of interest. Then we should narrow that down into more specific *hypothesis* that we can test. We narrow down even further when we collect *observations* to address the hypotheses. This ultimately leads us to be able to test the hypotheses with specific data - a *confirmation* (or not) of our original theories.



Inductive approach works the other way, moving from specific observations to broader generalizations and theories. (‘bottom-up’ approach)

In inductive approach, we begin with specific observations and measures, then to detect patterns and regularities, and formulate some tentative hypotheses that we can explore. Finally end up we develop some general conclusions or theories.



Differences between the 2 approaches

- Inductive approach is more open-ended and exploratory, especially at the beginning.
- Deductive approach is more narrow in nature and is concerned with testing or confirming hypotheses.
- Most social research involves both inductive and deductive reasoning processes at some time in the project.

Hypotheses

Hypotheses

A hypothesis is a specific statement of prediction.

- It describes in concrete (rather than theoretical) terms what you expect will happen in your study. WHAT WOULD YOU LIKE TO KNOW? WHAT DO YOU WONDER ABOUT? WHAT WOULD YOU LIKE TO MEASURE?
- *Not all studies have hypotheses*. Sometimes a study is designed to be exploratory. There is no formal hypothesis. The purpose of the study is to explore some area more thoroughly in order to develop some specific hypothesis or prediction that can be tested in future research.
- A study may have one or many hypotheses.

Usually, we are thinking simultaneously about *two* hypotheses:

- one that describes our prediction and
- one that describes all the other possible outcomes with respect to the hypothesized relationship.

Example

- Our prediction is that variable A and variable B will be related (we don't care whether it's a positive or negative relationship).
- Then the only other possible outcome would be that variable A and variable B are *not* related.

A hypothesis should always…

- explain what you expect to happen.
- be clear and understandable.
- be testable.
- be measurable.
- contain at least 1 dependent and 1 independent variable.

Conceptualizing, problem formulation, concept mapping

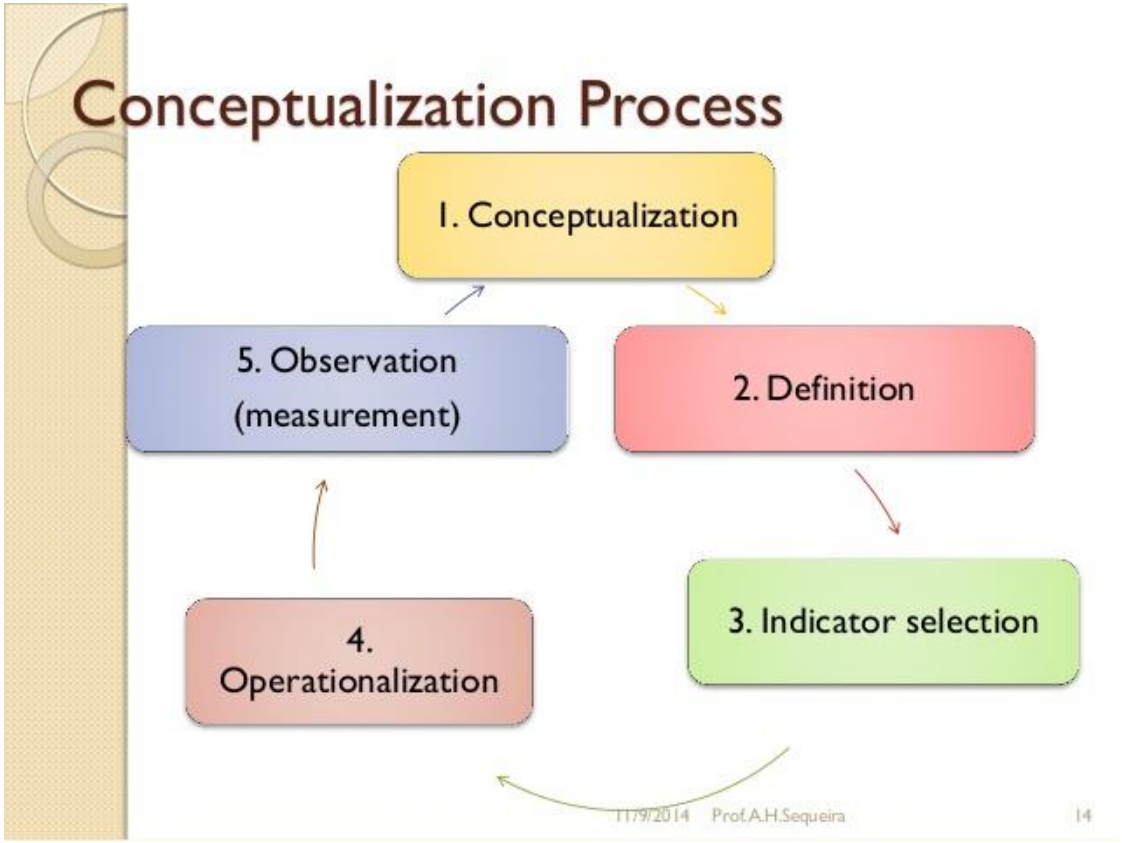
Conceptualization

- specify exactly what we mean and don't mean by the terms we use in our research.
- a mental process of organizing one's observations and experiences into meaningful and coherent wholes.

Operationalization

-Process taken to measure an abstract concept in terms of its observable, measurable characteristics.

-Making concrete questions to measure things we determined in the process of conceptualization.



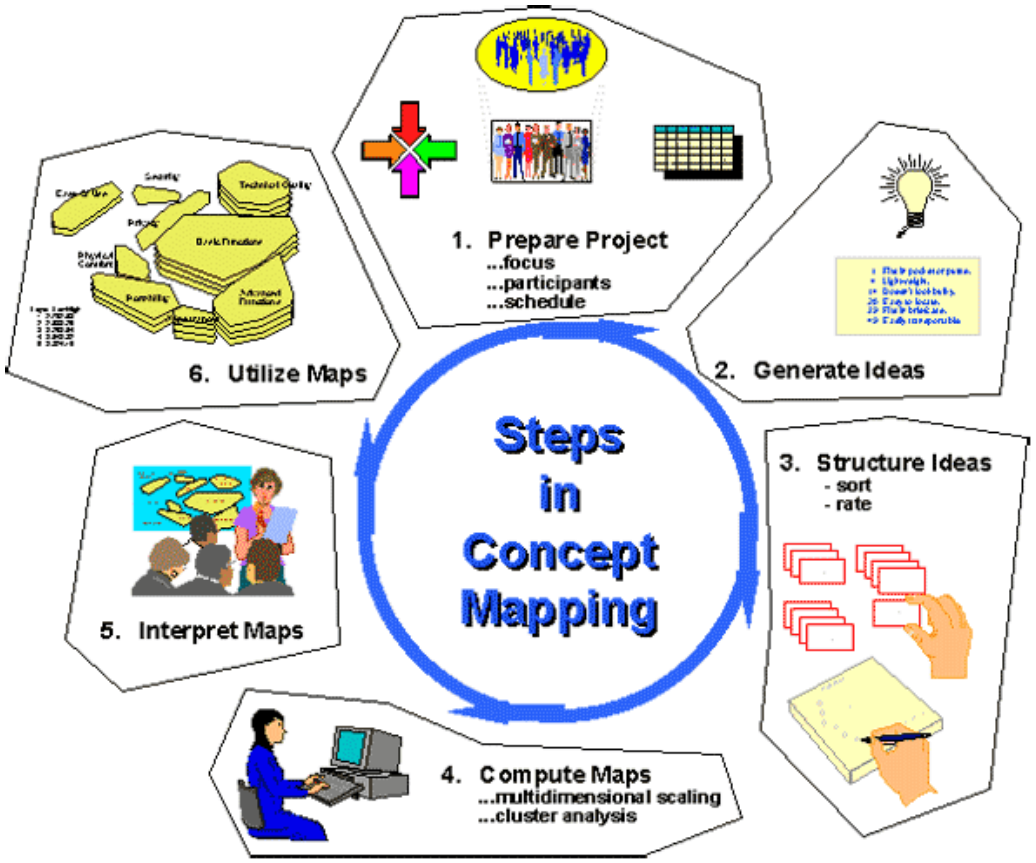
Problem Formulation

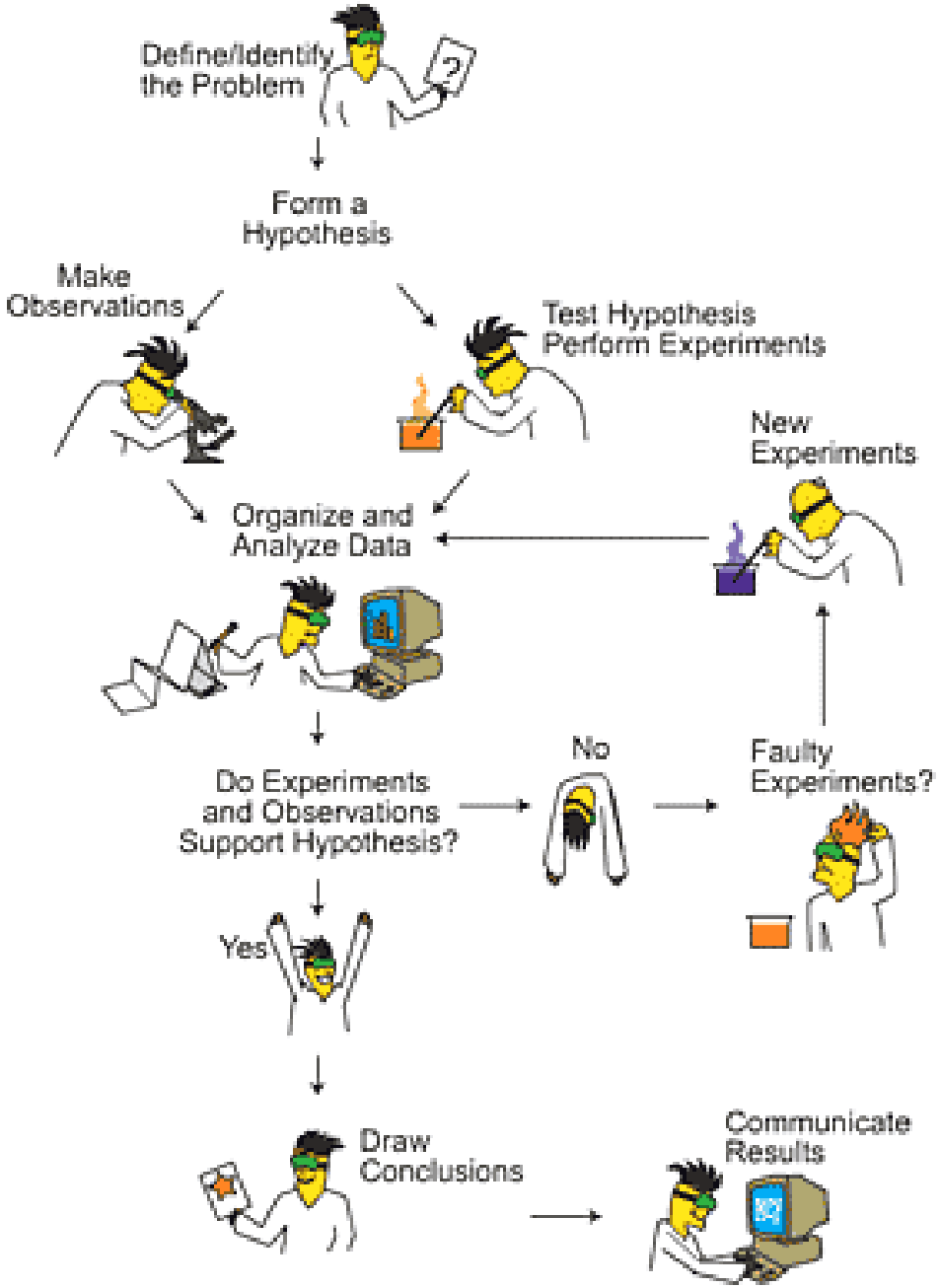
Where do research topics come from?

- practical problems in the field
- literature in a specific field
- think up an own research topic

Concept mapping

- The concept mapping help researchers formulate good research problems and projects.
- Other methods: brainstorming, nominal group technique, focus groups, etc.
- ***Concept mapping is a structured process, focused on a topic or construct of interest, involving input from one or more participants, that produces an interpretable pictorial view (concept map) of their ideas and concepts and how these are interrelated***.
- Concept mapping helps people to think more effectively as a group without losing their individuality. It helps groups to manage the complexity of their ideas without trivializing them or losing detail.




Define/Identify the Problem
Form a Hypothesis
Make Observations
Test Hypothesis Perform Experiments
New Experiments
Organize and Analyze Data
Do Experiments and Observations Support Hypothesis?
No
Faulty Experiments?
Yes
Draw Conclusions
Communicate Results

Five Big Words

1. Theoretical
2. Empirical
3. Nomothetic
4. Probabilistic
5. Causal

Theoretical
Empirical

Social research is

theoretical - it is concerned with developing, exploring or testing the theories or ideas

empirical - it is based on observations and measurements of reality on what we perceive of the world around us.

Most research is *a comparison of our theories about how the world operates with our observations of its operation.*

Nomothetic

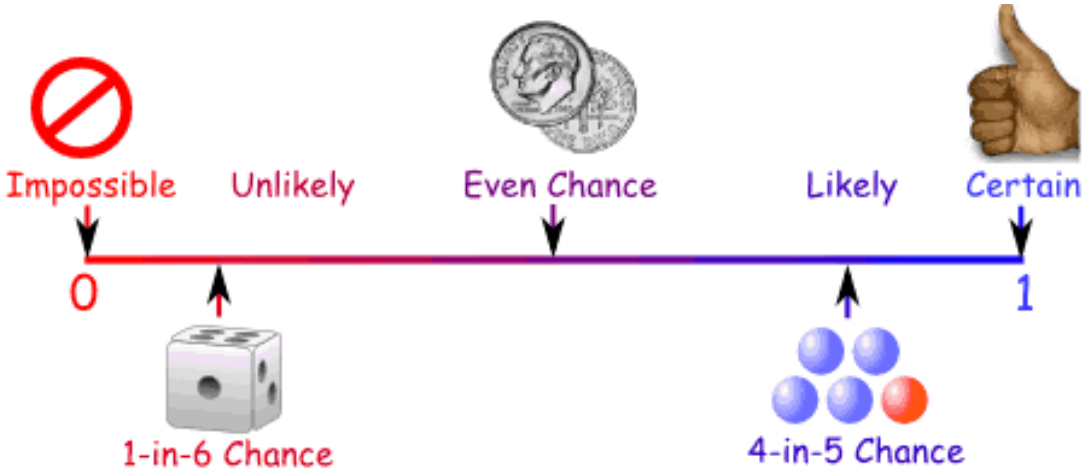
- We often study individuals, but usually we are interested in generalizing to more than just the individual.

Probabilistic

Probability - *How **likely** something is to happen.*

Social research based on probabilities. The inferences that we make in social research have probabilities associated with them - they are seldom meant to be considered covering laws that pertain to all cases.

Part of the reason we have seen statistics become so dominant in social research is that it allows us to estimate probabilities for the situations we study.



The probability of an event occurring is somewhere between impossible and certain.

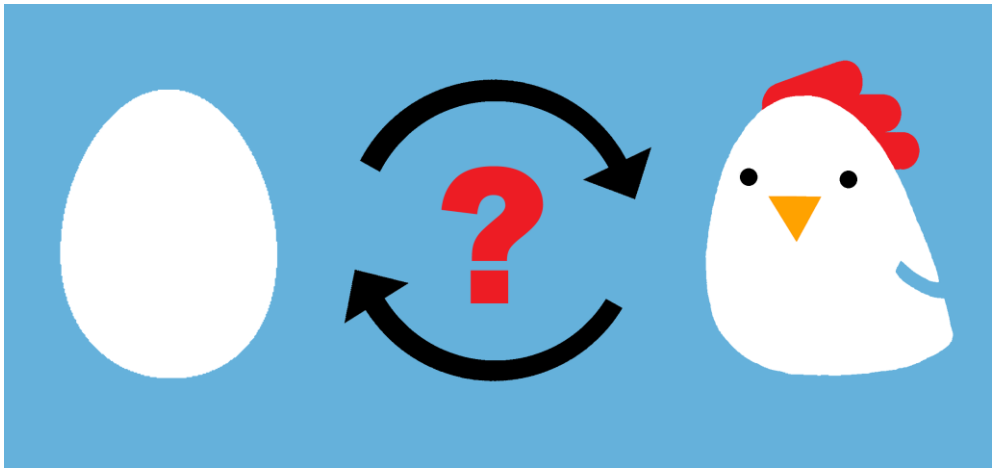
As well as words, we can use numbers (such as fractions or decimals) to show the probability of something happening:

Impossible is **zero**

Certain is **one**.

Causal

- The term **causal** means that most social research is interested in looking at cause-effect relationships.
- But! This doesn't mean that most studies actually study cause-effect relationships.
- There are studies that simply observe - *for instance*, surveys that seek to describe the percent of people holding a particular opinion.
- There are studies that explore relationships - *for example*, studies that attempt to see whether there is a relationship between gender and salary.
- Probably the vast majority of applied social research consists of these **descriptive** and **correlational studies**.



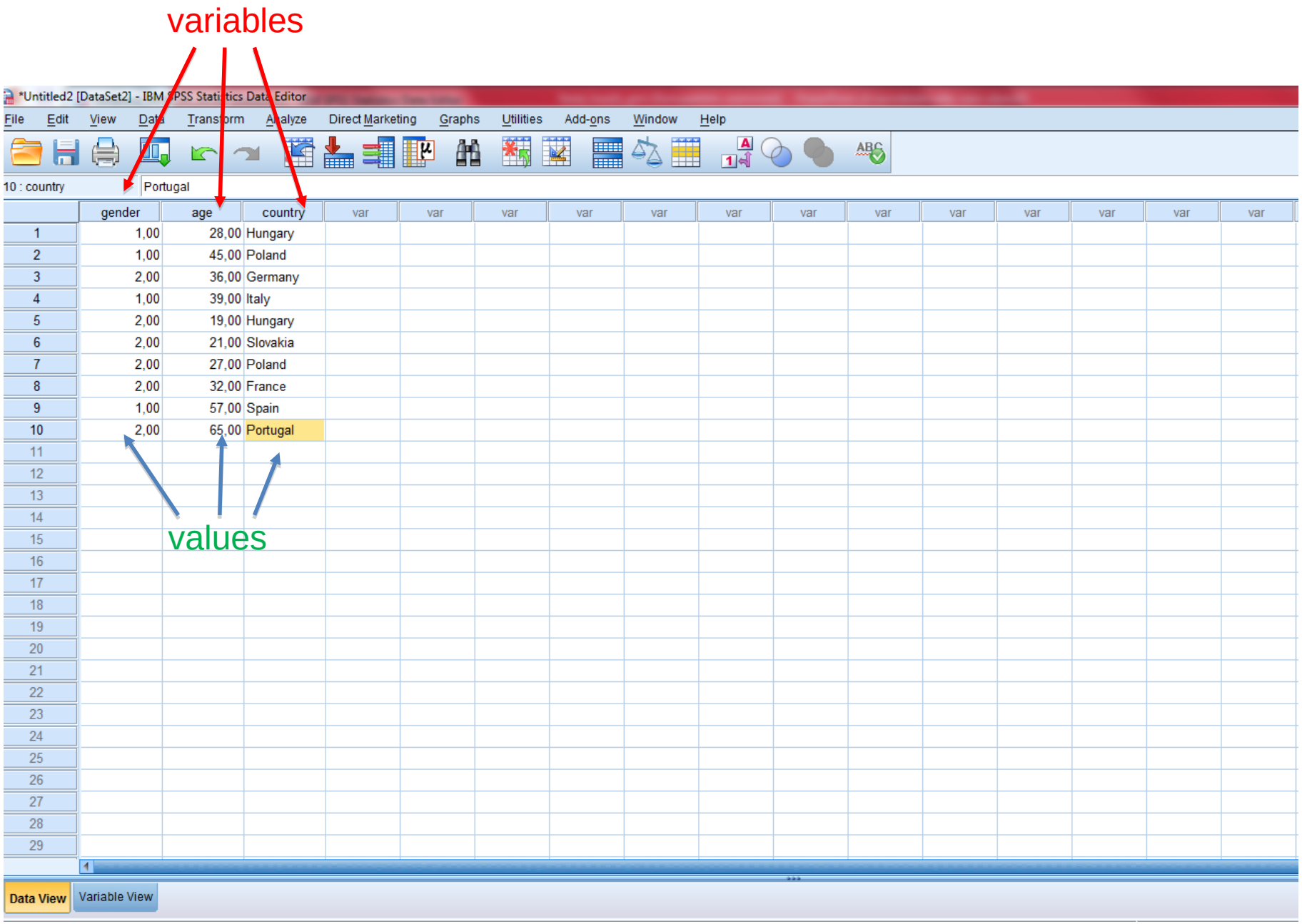
Types of Relationships

A relationship refers to the correspondence between two variables.

What is 'variable'?

- A ***variable*** is *any entity that can take on different values*. Anything that can vary can be considered a variable.

For instance?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gender age country var var var var var var var var var var var var
1 1,00 28,00 Hungary
2 1,00 45,00 Poland
3 2,00 36,00 Germany
4 1,00 39,00 Italy
5 2,00 19,00 Hungary
6 2,00 21,00 Slovakia
7 2,00 27,00 Poland
8 2,00 32,00 France
9 1,00 57,00 Spain
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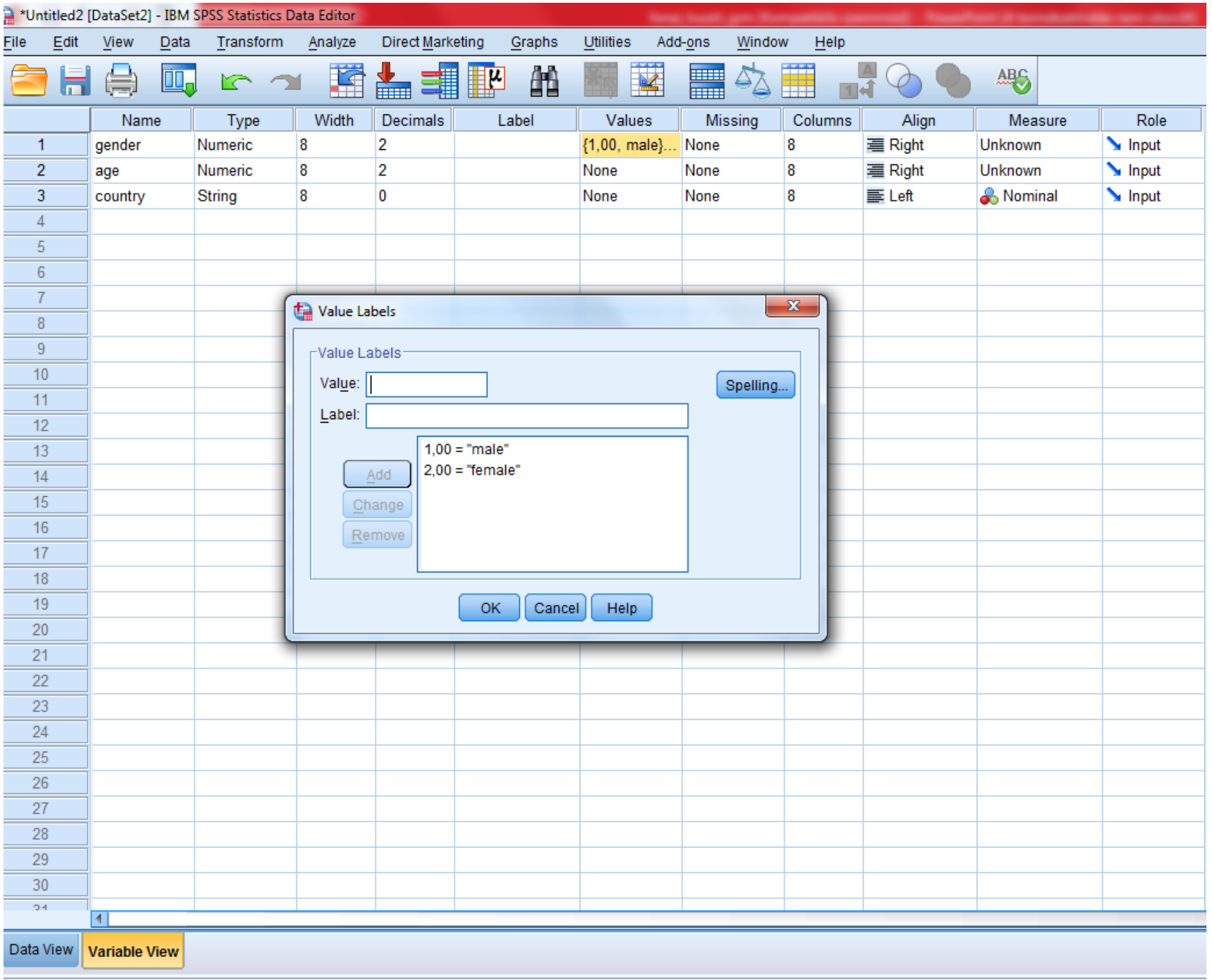
values
Data View
Variable View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2 age Numeric 8 2 None None 8 Right Unknown Input
3 country String 8 0 None None 8 Left Nominal Input
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2,00 = "female"
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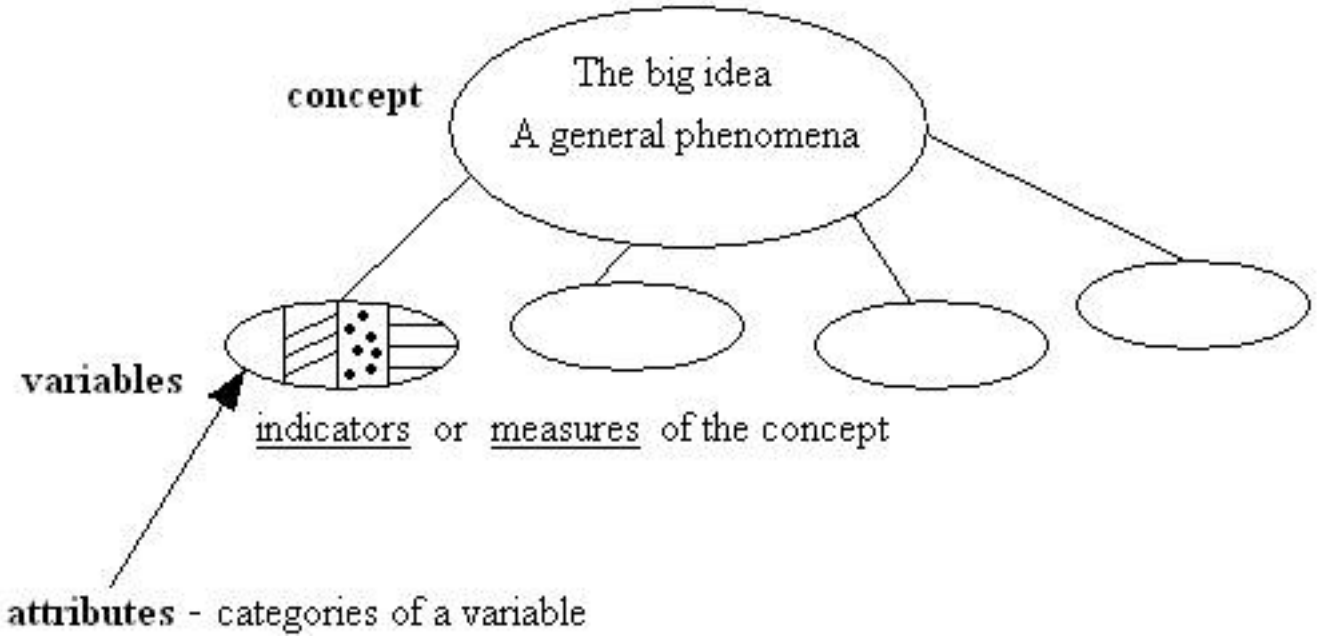


Variables mean the logical groupings of *attributes.*

Attributes: characteristics of persons or things. A specific value on a variable

For example:

Variable - gender/sex

its attributes are 1=male, 2=female

OR

Variable - Agreement with sg.

Attributes can be

1= strongly disagree 2=disagree 3=neutral 4=agree 5=strongly agree

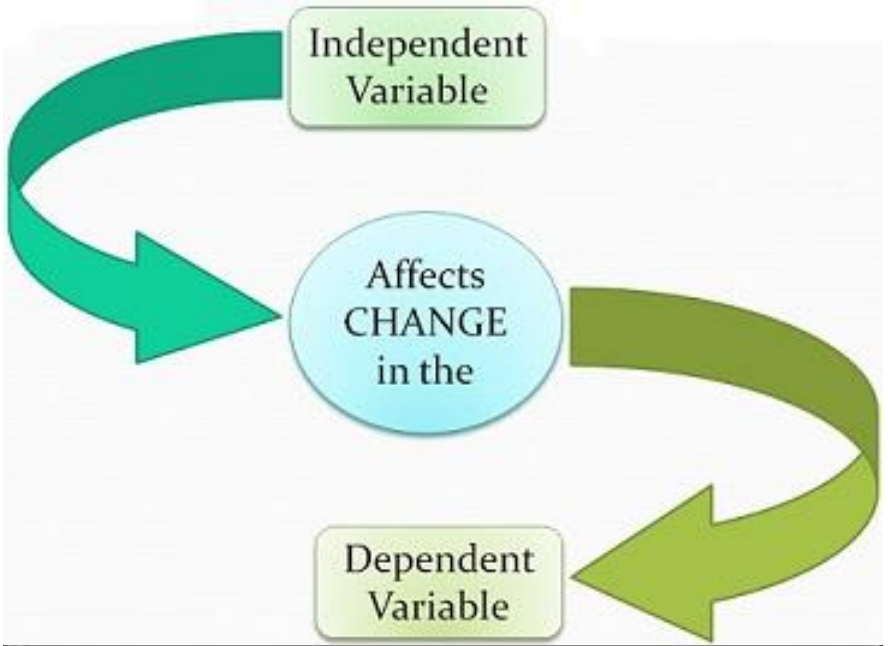
Main types of variables

- *Independent variable - what you (or nature) manipulates.* An independent variable is presumed to cause or explain a *dependent variable.*

Note that any given variable might be treated as independent in one part of an analysis and dependent in another part of the analysis.

For example: If we discover that religiosity is partly a function of gender (women are more religious than men) gender is the independent variable and religiosity is the dependent variable. Religiosity might become an *independent variable* in the explanation of crime.

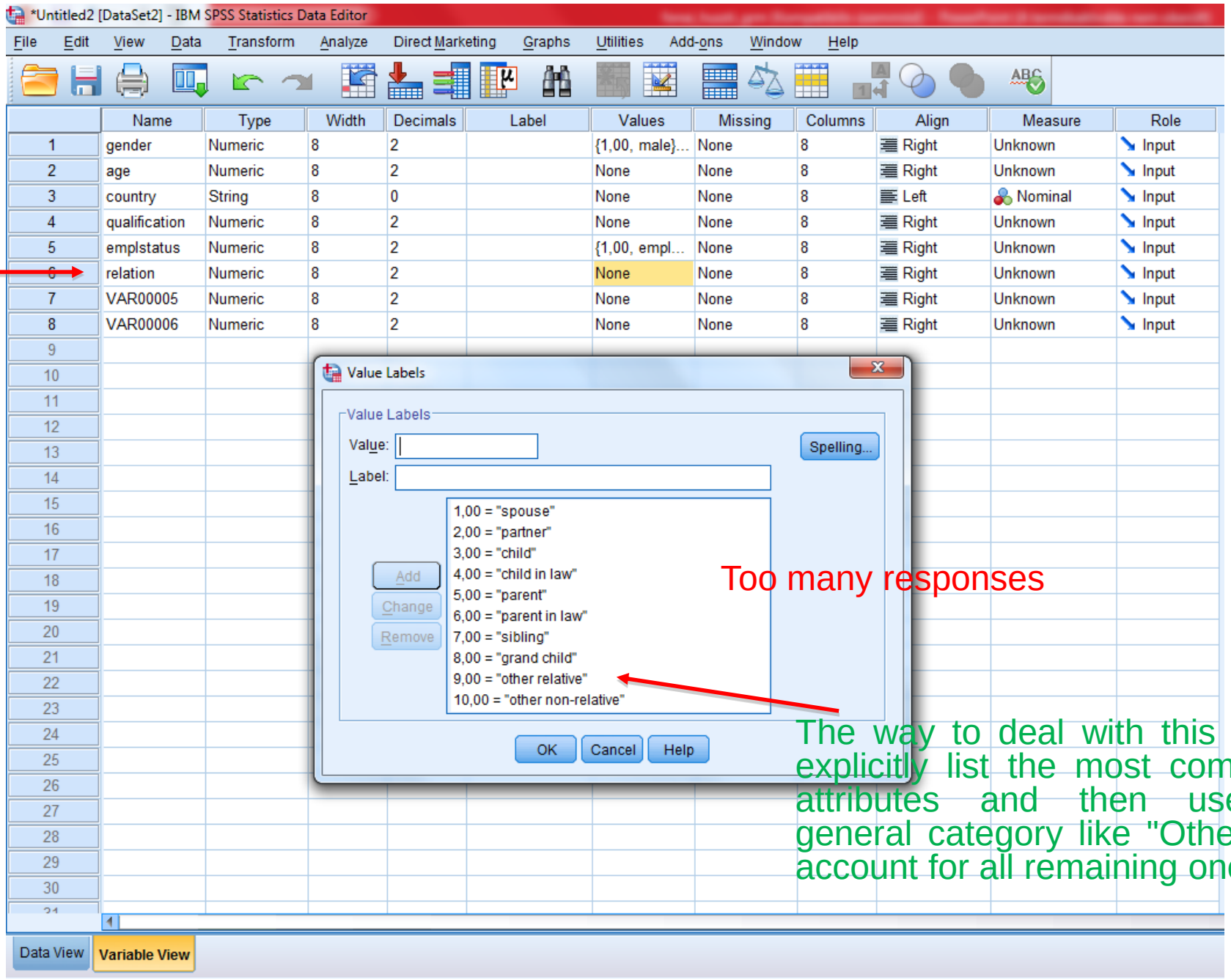
- *Dependent variable - what is affected by the independent variable.* That variable that is assumed to depend on, or be caused by, another (called the *independent variable*).



Main rules of variables

- Each variable should be ***exhaustive*** - it should include all possible answerable responses.

- The attributes of a variable should be ***mutually exclusive***, no respondent should be able to have two attributes simultaneously.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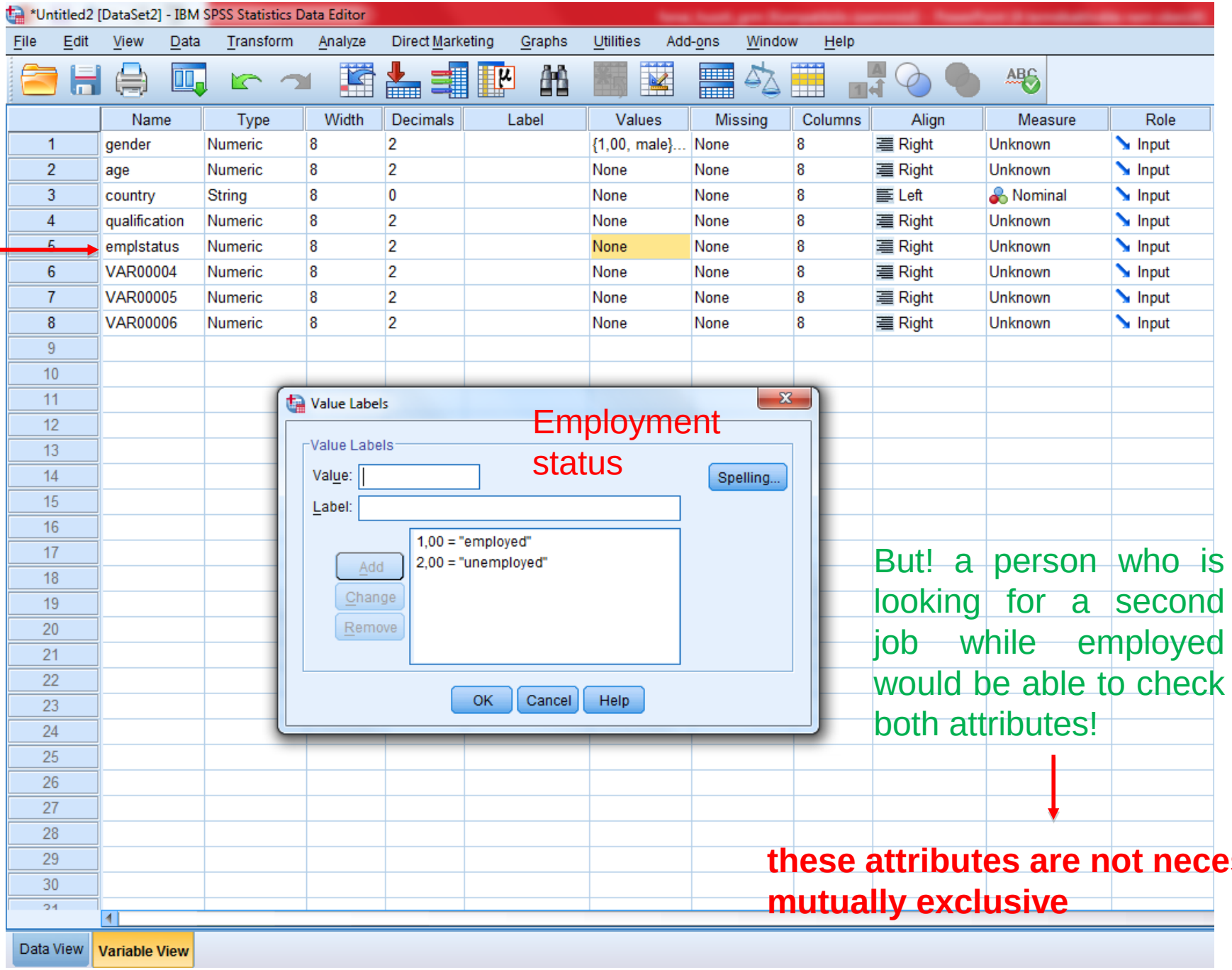
2 age Numeric 8 2 None None 8 Right Unknown Input
3 country String 8 0 None None 8 Left Nominal Input
4 qualification Numeric 8 2 None None 8 Right Unknown Input
5 emplstatus Numeric 8 2 {1,00, empl... None 8 Right Unknown Input
6 relation Numeric 8 2 None None 8 Right Unknown Input
7 VAR00005 Numeric 8 2 None None 8 Right Unknown Input
8 VAR00006 Numeric 8 2 None None 8 Right Unknown Input
Value Labels
Value Labels
Value:
Label:
Spelling...
Add
Change
Remove
1,00 = "spouse"
2,00 = "partner"
3,00 = "child"
4,00 = "child in law"
5,00 = "parent"
6,00 = "parent in law"
7,00 = "sibling"
8,00 = "grand child"
9,00 = "other relative"
10,00 = "other non-relative"
OK Cancel Help
Too many responses
The way to deal with this is to explicitly list the most common attributes and then use a general category like "Other" to account for all remaining ones.
Data View
Variable View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8 VAR00006 Numeric 8 2 None None 8 Right Unknown Input
Value Labels
Value Labels
Value:
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Add
Change
Remove
1,00 = "employed"
2,00 = "unemployed"
OK Cancel Help
Employment status
But! a person who is looking for a second job while employed would be able to check both attributes!
these attributes are not necessarily mutually exclusive
Data View
Variable View

Types of relationships between variables

We can observe

1. the *nature* of the relationship or
2. the *pattern* of it.

Relationships between variables can be…

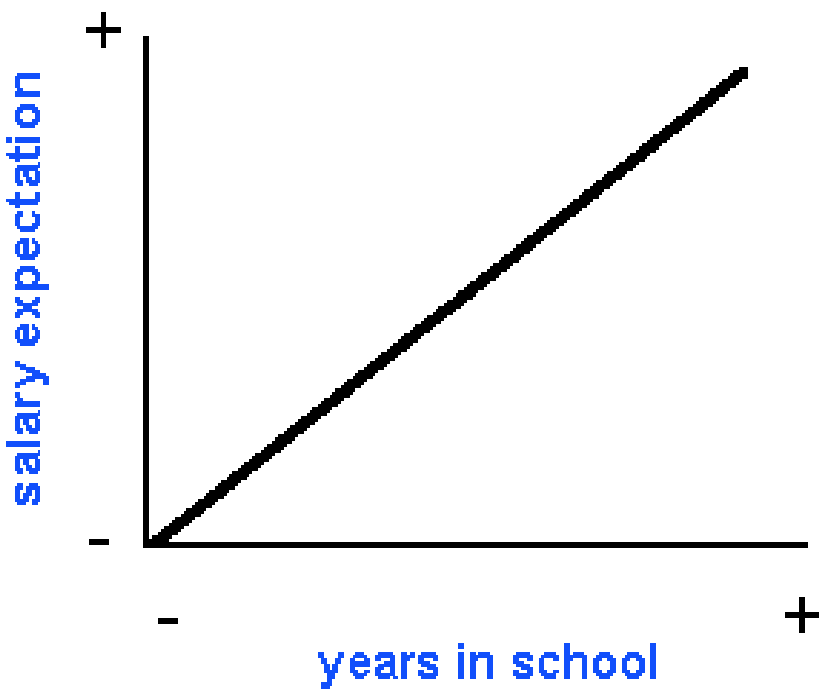
1. Positive
2. Negative
3. Curvilinear

Relationships between variables can be…

Positive

relationship between two *variables* in which one variable increases in value as the other variable also increases in value (or one decreases as the other decreases).

For example, we might expect to find a positive relationship between years in school and salary expectation.

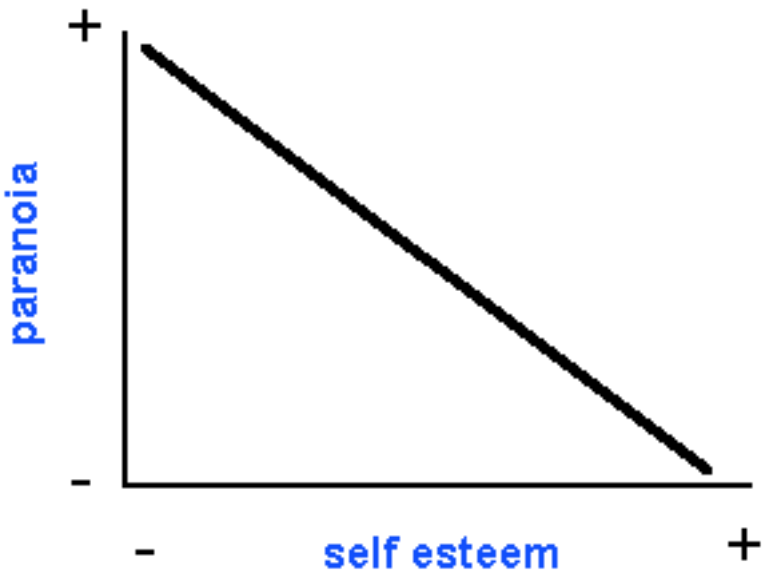


Relationships between variables can be…

Negative

relationship between to variables in which one variable increases in value as the other variable decreases.

This is also sometimes termed an ***inverse*** relationship. There is an idealized negative relationship between a measure of self-esteem and a measure of paranoia in psychiatric patients.

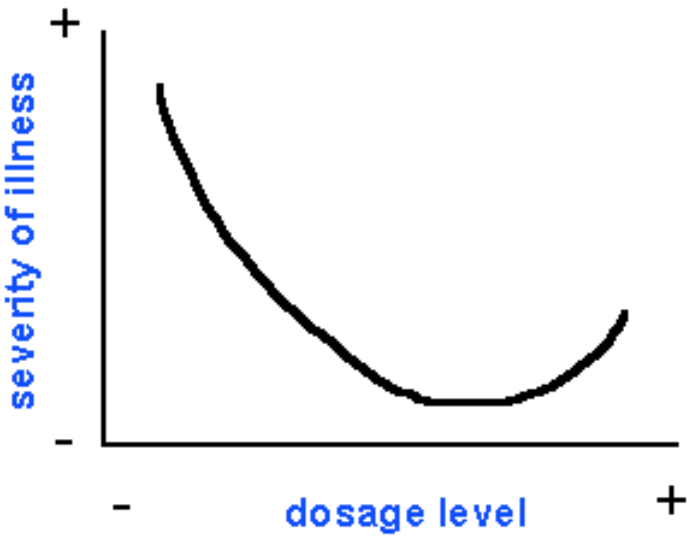


Relationships between variables can be…

Curvilinear

a relationship that changes over the range of both variables.

In this example, the horizontal axis represents dosage of a drug for an illness and the vertical axis represents a severity of illness measure. As dosage rises, severity of illness goes down. But at some point, the patient begins to experience negative side effects associated with too high a dosage, and the severity of illness begins to increase again.



No relationship

If you know the values on one variable, you don't know anything about the values on the other.

For instance, I suspect that there is no relationship between the length of the lifeline on your hand and your grade point average (GPA). If I know your GPA, I don't have any idea how long your lifeline is. ☺

The nature of the relationships: correlational vs. causal

The key distinction between a simple ***correlational relationship*** and a ***causal relationship*** is, that while all relationships tell about *the correspondence between two variables*, there is a special type of relationship that holds that the two variables are not only in correspondence, but that one *causes* the other.

A correlational relationship simply says that two things perform in a synchronized manner.

•For instance, there has often been talk of a relationship between ability in math and proficiency in music. In general people who are good in one may have a greater tendency to be good in the other; those who are poor in one may also tend to be poor in the other. If this relationship is true, then we can say that the two variables are correlated. But knowing that two variables are correlated does not tell us whether one *causes* the other.

MATH → MUSIC

There is a correlation

BUT!

What can be the cause(s)????

3rd variable problem

For instance, that there is a correlation between the number of roads built in Europe and the number of children born in the United States.

Does that mean that if we want fewer children in the U.S., we should stop building so many roads in Europe?

Or, does it mean that if we don't have enough roads in Europe, we should encourage U.S. citizens to have more babies?

Of course not.

While there is a relationship between the number of roads built and the number of babies, we don't believe that the relationship is a *causal* one.

- This leads to consideration of what is often termed the ***third variable problem***. In this example, it may be that there is a third variable that is causing both the building of roads and the birthrate, that is causing the correlation we observe.
- For instance, perhaps the general world economy is responsible for both. When the economy is good more roads are built in Europe and more children are born in the U.S.
- **NOTE: The key lesson here is that you have to be careful when you interpret correlations.**

Types of data, unit of analysis

Types of data

The fundamental distinction between two types of data: **qualitative** and **quantitative**.

- quantitative - if it is in numerical form and
- qualitative - if it is not in numerical form. (Notice that qualitative data could be much more than just words or text. Photographs, videos, sound recordings and so on, can be considered qualitative data.)

Unit of analysis

The unit of analysis is the major entity that you are analyzing in your study.

Any of the following could be a unit of analysis in a study:

- Individuals *(e.g we are interested in studying people's shopping behavior or their attitudes to new technologies, the unit of analysis is the individual)*
- Groups *(e.g. we want to study the characteristics of street gangs or team working in organizations, the unit of analysis is the group)*
- artifacts (books, photos, newspapers)
- geographical units (town, census tract, state)
- social interactions (dyadic relations, divorces, arrests)

Ethics in Research

The main rules:

- The principle of ***voluntary participation*** requires that people not be press into participating in research. This is especially relevant where researchers had previously relied on 'captive audiences' for their subjects -- prisons, universities, and places like that.
- Closely related to the notion of voluntary participation is the requirement of ***informed consent***. Essentially, this means that prospective research participants must be fully informed about the procedures and risks involved in research and must give their consent to participate.
- Ethical standards also require that researchers not put participants in a situation where they might be at ***risk of harm*** as a result of their participation. Harm can be defined as both physical and psychological.
- Almost all research guarantees the participants ***confidentiality*** - they are assured that identifying information will not be made available to anyone who is not directly involved in the study.
- The stricter standard is the principle of ***anonymity*** which essentially means that the participant will remain anonymous throughout the study - even to the researchers themselves.