UNIT 3: QUALITATIVE RESEARCH METHODS

QUESTION #3.1: What does primary psychological research study?

SHORT ANSWER: what can be measured empirically: variables and constants

Primary research in psychology is when you collect new data by measuring variables. **A variable is something that can change, and can be measured empirically**. (A **constant** is something that does not change, and we can verify that it has not changed.)

http://www.youtube.com/watch?v=5Z5U1BUsZ00

Any report of scientific research should describe how the variables were measured. This constitutes the operational meaning of those variables. A good **operational definition** is one that clearly states how the variables were measured.

http://www.youtube.com/watch?v=yUi5NJZlvx4

Operational definitions should also be valid and reliable, but that will be explained in the next unit.

There are two types of variables: **dependent (observed effects)** and independent (usually understood to be the possible causes of those effects). In psychology, the dependent variable will always be some form of **behavior**. Going back to the stimulus and response model introduced in the first chapter, it can be said that in psychology, the dependent variable corresponds to the **response**. Here are some examples of dependent variables and their operational definitions.

ORGANISM	DEPENDENT VARIABLE	OPERATIONAL DEFINITION
Rat	Performance running a maze	Number of seconds it took to get through the maze
Voter	Attitude about a political candidate	Whom the voter says that she will vote for
Consumer	Decision to purchase a product	Whether or not the consumer purchases the product
Worker	Absenteeism	How many times last year the worker did not show up for a scheduled shift

Patient	Depression	Score on a valid and reliable depression scale

All decisions are dependent variables, but not all dependent variables are decisions (e.g., outcomes).

In psychology, whenever we are talking about actions, decisions, choices, attitudes, performance, or scores on tests, we are talking about dependent variables. Of course, each of these variables could also be seen as a cause of some other event further down the causal chain of events. The rat may receive a reward for running the maze quickly, the worker might get fired for his absenteeism. However, in psychology, the dependent variables are the behaviors, not the later consequences of the behaviors.

Independent variables are the potential influences upon behavior. Some independent variables are **stimuli** coming in from the environment. Here are some examples of such independent variables.

ORGANISM	**INDEPENDENT VARIABLE** *(stimulus factor)*	**DEPENDENT VARIABLE** *(influenced by the independent variable)*
Rat	Shape of the maze	Performance running the maze
Voter	Campaign materials	Attitude about political candidate
Consumer	Advertisement	Decision to purchase a product
Worker	The weather report	Absenteeism
Patient	Death of his wife three months ago	Depression

All stimuli are independent variables, but not all independent variables are stimuli. Another type of independent variable would be something in the organism's background that also influences the organism's behavior. This can include hereditary factors or experiences during a formative time in the organism's life, such as early childhood, or cultural factors.

ORGANISM	**INDEPENDENT VARIABLE** *(background factor)*	**DEPENDENT VARIABLE** *(influenced by the independent variable)*
Rat	Age of rat	Performance running a maze
Voter	Raised by parents who were strict Republicans	Attitude about a political candidate
Consumer	Female gender	Decision to purchase a product
Worker	His father was an alcoholic	Absenteeism
Patient	He was orphaned in childhood	Depression

The goal of science is to understand, predict, and control. Science tries to explain things in terms of cause and effect. Psychology is the science of behavior, so it tries to explain behavior in terms of independent and dependent variables. The variable we try to predict is known as the **criterion** variable. All criterion variables are dependent, but not all dependent variables are criterion variables. We sometimes use certain dependent variables (along with independent variables) as **predictors** of future criterion variables. Here are examples of different kinds of predictor variables.

ORGANISM	**PREDICTOR VARIABLE**	**DEPENDENT VARIABLE** *(future outcome)*
Rat	The rat ran the maze quickly yesterday DV: previous outcome	The rat will probably run the maze quickly again today
Voter	She voted Republican last time DV: previous decision	She will probably vote Republican again this year
Consumer	She is a woman IV: background	She will probably look for clothes in the women's section
Worker	His supervisor has evaluated him as "irresponsible" DV: assessment	He will probably be absent more often than the other workers
Patient	He is now getting psychotherapy IV: treatment	Depression will probably subside in eight weeks

QUESTION #3.2: Whom does psychology study?

SHORT ANSWER: people, as individuals, groups, samples and populations

Psychology studies the behavior of people and animals. We use the term **subject** to describe the **person or animal (the organism)** whose behavior we are studying. We do not use the term subject to describe the topic of the study. (The topics are defined by variables studied.) I will

use the terms subject, participant, case, and organism synonymously in this book. So, a given subject could be a rat, a pigeon, a dog, a human patient, a worker, a voter, or a consumer.

The **population is the general class of subjects** we are studying. Examples of populations might be all rats of a certain species, all female consumers, all U.S. voters, all workers in a certain industry, all depressed patients. In consumer behavior, the relevant population might be all current customers, all residents of a certain geographical area, or all dog owners. The nature of the product and/or the location of the service may define which population is relevant.

Unless we are doing a complete **census**, we cannot directly observe all the members of a given population. We only get data from a few subjects. **A sample is what we call the subjects actually observed**. Examples of samples would be: the rats (n = 24) which we observed running this particular maze, the voters (n = 980) whom we polled, the workers (n = 14) on the dayshift in the shipping and receiving department, and patients (n = 34) receiving psychotherapy for depression at the clinic, the customers (n = 123) who sent in product registration cards for the clothing purchased at the local WalMart in March,

http://www.youtube.com/watch?v=n3n8PP0Sk5U

There are two essential features of good sampling. The first is an adequate sample size. In general, the larger the sample is, the more statistically significant the data are. The second feature is that the sample be representative of the population. In general, a sample is representative of the larger population if it is similar on the most relevant background variables: gender, age, geography, etc.

Representativeness is even more important than absolute size. If our sample of voters (n = 246) all came from a gun show, we should not expect them to represent the general population on an issue such as gun control. If our sample of clothing customers (n = 124) were all large sizes, that would not representative of all the clothing customers who may have different clothes buying experiences and preferences.

One of the best ways to get a representative sample is to have one that was **randomly** selected. This does not mean that the sampling was haphazard, but that each subject in the population had an equal chance of being selected as part of the sample.

http://www.youtube.com/watch?v=t0x080SuqPc

One kind of sample that is rarely representative is when the subjects are self-selected. If we run an ad in the local newspaper inviting people to vote in a telephone poll about pension benefits, those who call in will not be a representative sample of the population of all voters. People who are more likely to read the newspaper, have a phone, and have time to phone, will be over-represented. A more important factor in self-selected samples is motivation. People who are more fervent in their attitudes are more likely to participate. In the case of this example of

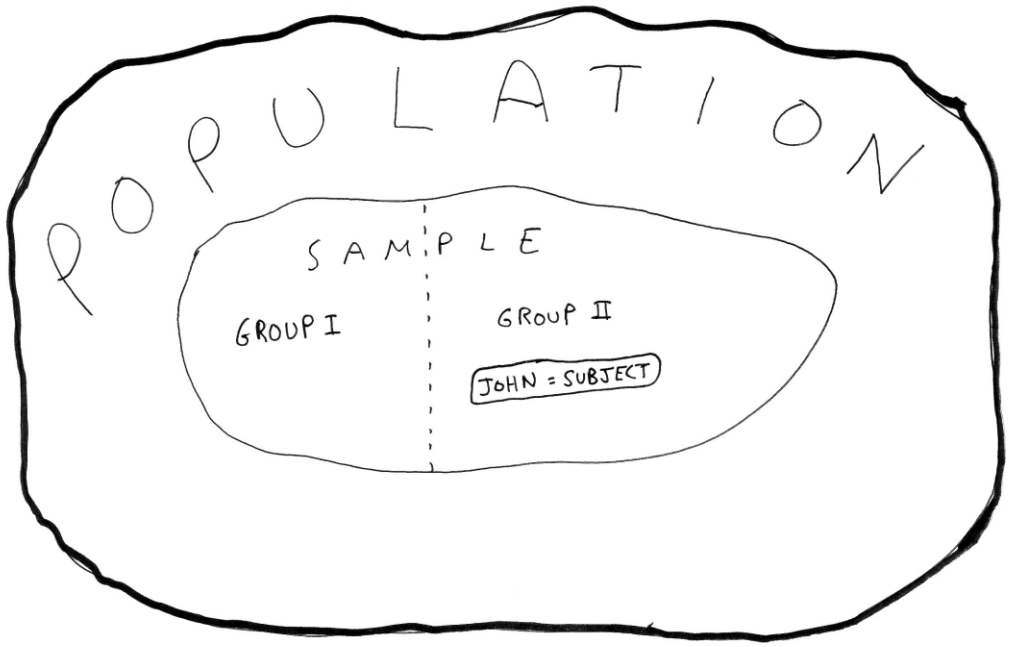
pension benefits, few young people might be motivated enough to make the effort to call in, while many older persons living on their pensions would definitely want their views made known. (Some might even call in several times.) Surveys that solicit participants on the internet have this problem of self-selection.

Some forms of psychological research take a sample and divide it into two **groups** that are then compared. These groups may be defined by independent variables (e.g., male vs. female) or by allowing the subjects to self-select their grouping (e.g., Democrats vs. Republicans) in which case the grouping would be done on the basis of a dependent variable.

Part / Whole Relationships

POPULATION	SAMPLE	First group (women)	Sally Jones (one subject)
			Maria Garcia (one subject)
			Betty Williams (one subject)
			Michelle Nguyen (one subject)
		Second group (men)	Bob Smith (one subject)
			Juan Gonzalez (one subject)
			Bill Johnson (one subject)
			Eric Wong (one subject)
	Subjects not observed		

The relationship between population, sample, group, and subject



QUESTION #3.3: How should we begin a research study?

SHORT ANSWER: identify the research questions and determine if quantitative or qualitative methods are called for

Most psychological research begins with a specific question, such as…

- Are women the majority of the customers who purchase laundry products?
- Do young people account for most of the box office for action movies?
- Is this shirt more popular in India or China?
- Are most of our present customers repeat buyers?
- Which advertisement is more effective?
- Which size of package will sell more potato chips?
- Will more airline tickets be sold if we allow passengers to download boarding passes on their cell phones?
- If we cut the price, will we increase profits?

Notice that all of the above questions require a quantification of the results.

- In one country, women account for 84% of the sales of laundry products?
- At one theater chain, movie goers under the age of 25 accounted for 78% of the box office for action movies
- This shirt sold 3 million copies in India, but less than a quarter of a million in China
- Of the customers who purchased one of our automobiles in 2012, 47% were first time car buyers, 33% had previously owned one of our cars, and only 20% had owned only cars made by our competitors.
- This ad generated $2.5 million in sales in Toluca while that ad generated $1.7 million in sales in Cuernavaca.

- The large package sold 2.1 million bags of potato chips last month, while the small package only sold 1.4 million bags.

- Last month, our airline sold 22,321 seats on the Mexico City route, but now that passengers can download their boarding passes on their cell phones, we sold 19,323 with downloads and 15,323 without.

- We cut prices 10% and profits went down 4%.

Some research questions do not require a mere quantification, but require a more elaborate description or explanation.

- How do women decide which brand of laundry products to purchase?

- Why aren't older adults going to the movies more often?

- How does a logo on a t-shirt become a fad in India?

- Why aren't more of our previous customers coming back to purchase new cars?

- What kind of advertisement will appeal to a young worker who has just moved from the countryside?

- What do customers think of our packaging?

- Why did 2,321 people who clicked on our website last week not complete the purchase of an airline ticket?

- How important is price in the customer's decision of which brand to purchase?

So, unless we have a research question that can be answered with a simple quantification, we should consider (at least starting with) qualitative research methods.

QUESTION #3.3: What is a hypothesis?

SHORT ANSWER: a prediction that can be confirmed by quantitative research

If the question that begins our research is based upon some theoretical or assumed relationship between variables, it could generate a specific prediction. A **hypothesis** (plural hypotheses) is what we call the specific prediction that guides research. The purpose of quantitative research is to gather data that can test the hypothesis. The hypothesis is to research what diagnosis is to clinical work: a starting point for the treatment proposed at present, based upon a past fund of knowledge, and confirmed (or not confirmed) by future results. Ideally, the hypothesis should

be stated in measurable and quantitative terms, and should be capable of confirmation to a certain statistical level.

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GRAMMAR LESSON: The word *hypothesis* is singular. The plural is *hypotheses.* The adjective would be *hypothetical*.

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If we do not yet have such hypotheses, then we are not yet ready for quantitative research. We need to start with qualitative research in hopes of formulating a specific hypothesis which we may then test with subsequent quantitative research.

QUESTION #3.4: How are variables measured?

SHORT ANSWER: variables can be measured on a spectrum ranging from richness to precision

Data are said to be **qualitative** if they are non-numerical, i.e., if they describe variables or constants by using something visual (i.e., images) or narrative (words instead of numbers). Such data come from in-depth case studies, open-ended interviews, focus groups, ethnographies, or field observations. No statistics can be performed on purely narrative level data (unless we try to convert them into categories, frequencies, or scores). Qualitative data are the least precise, but they are the **richest** representation of the subject's own perception of reality.

http://www.youtube.com/watch?v=aKClWoeXysE

Data are said to be quantitative if they are based upon numerical results of counting. Numerical data can be expressed in different scales differing according to their levels of precision.

Nominal scales involve classification of each case into a distinct category. Some statistics textbooks call this level of measurement "qualitative" or "non-numerical" but most marketing researchers prefer to reserve these terms for data that are in the form of pure image or narrative.

Ordinal scaling has some kind of ordering, seriation, ranking, or other comparison or gradation of magnitude or degree. In other words, ordinal scales mean that two cases can be compared in such a way so that one case can be said to have more of the variable, or be higher on that variable, compared to the other case. Ordinal scales include measures of frequency (how often) and levels of agreement (e.g, a Likert scale).

Interval and **ratio** scaling use numbers in such a way to indicate test scores, numbers of events (e.g., purchases, clicks on a site).

If you cannot figure out how to measure your variables with frequencies, scores, levels, ranks or categories, you must start with qualitative research.

QUESTION #3.5: What is the oldest form of qualitative research?

SHORT ANSWER: start with introspection, but be aware of its limitations

Introspection means self-reflection, looking within at our own thoughts, emotions, and behaviors. This is the oldest form of psychological research, going back to when the first human exercised these powers of self-reflection, asking "Why do I do what I do? think what I think? feel what I feel?" Each of us has used introspection as starting point for our ideas on human behavior, but few of us have been as systematic as the great theologian Augustine (354-430 C.E.) in his autobiography. Even as late as a hundred years ago, introspection was still the major research technique in academic psychology, used by Wundt, Titchener, and James. Although they developed many sophisticated guidelines for improving introspection, it was rejected by Watson as being insufficiently scientific for what psychology was becoming.

There are several limitations to introspection. First, and foremost, is that of bias. The observer (the psychological researcher) is also the observed. People may not report what they are really feeling or thinking, but what they prefer to imagine that they were thinking or feeling (or what they think will present them in the best light in front of others who may be reading their research).

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GRAMMAR LESSON: *Bias* is the singular noun, not *biasness*. The plural is bias*es*. *Bias* is also a verb. Its adjectival form required the *ed* and becomes *biased*. So, do not say “He was bias” but “He was biased” or “He had a bias.”

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A related problem is that the observation may change what is being observed. When someone knows that he is looking at his own thoughts, and attempting to record them, that very process might alter those thoughts, changing the course of the stream of consciousness. Thinking about what you are thinking about changes your thoughts. Indeed, it is not clear where one’s role as research subject (data provider) ends and where one’s role as researcher (data interpreter) begins. When I start thinking about what I am thinking about, those are thoughts too.

Another problem is that the sample size (n = 1) is too small and not representative: Augustine may have given us a great example of his self-reflection, but he was a genius and a saint, titles to which most of us may only aspire.

Most academic psychologists followed Watson's lead and rejected introspection, which is why most departments of psychology do not even have courses about qualitative research methods. You may have to go into another social science (e.g., sociology) if the course in marketing research does not give adequate coverage to qualitative methods.

We must agree with Watson on one point: introspection is not the most developed form of scientific proof. Introspection cannot establish a cause and effect relationship between the emotions, thoughts, and actions that emerge in our minds. However, Watson may have been too quick to completely reject introspection from modern academic psychology. While introspection cannot test hypotheses, it is an excellent way to generate a hypothesis that would then have to be tested by some other research method.

Those who investigate consumer behavior should start with introspection (but not stop with introspection). We are all consumers and therefore by reflecting on our own thoughts we do learn something about our motives and decision making processes.

The real challenge when using introspection (and all qualitative methods) is for the researcher to maintain a disciplined subjectivity as a dispassionate investigator.

QUESTION #3.6: What is a case study?

SHORT ANSWER: an in depth study of one individual, organization, place or event

The case study is an in-depth study of one particular subject. The individual in question might be a famous person, and so the case study would be a biography that gives an account of his or her background and later behavior. In clinical psychology case studies are frequently done on individual patients, describing their presentation of symptoms, psychometric assessment, relevant background, diagnosis, course of treatment, and outcomes. However, neither these biographies nor clinical studies are of much use in the study of consumer behavior.

We could do an in depth study of one particular person who is a consumer, using techniques such as a shopping journal, but the problems of case studies would still persist. Unfortunately, the case study has some of the same limitations that we find in introspection. Most obvious is the limited sample size (n = 1).

Most researchers in consumer behavior do not perform case studies on individual human beings, but rather large units: a household, a corporation, a store, a locality (the kinds of studies made by sociologists and anthropologists, rather than psychologists). Sometimes such research is known as field work, participant observation, ethnography, ethnomethodology, phenomenology, or grounded theory. The common purpose is to present non-numerical data in order to create a "storied lives" which reveals the subjects' own perception of their reality is richly conveyed by the researcher.

A key decision made by the researcher is that of site selection: which household, store, school, company, restaurant, bowling alley, neighborhood or city will be selected for this intense observation. Of course, no one individual or other unit can be truly representative of the entire population. That should not be the focus of qualitative research, which should strive for capturing the unique experience of the unit being studied.

QUESTION #3.7: What are other qualitative research techniques?

SHORT ANSWER: anything that results in data in the form of images or narratives

The distinctions between the different forms of qualitative research are not hard and fast; they frequently blend into each other. As long as we have data that are images or narratives, we are conducting qualitative research. All of the following projects would qualify.

- What kinds of images have been used in television ads for Sharia-compliant mortgages in San Diego, California?

- What kinds of images of oil companies appeared in political cartoons during the twelve months after the BP oil spill in the Gulf of Mexico?

- What kinds of images appear in print ads for action movies in the Philippines?

- What kinds of images appear on the Facebook pages of new members of multi-level marketing organizations?

- What themes can be found in advertising copy for radio ads for new car dealerships in southern California?

- What themes can be found in lyrics added to formerly popular tunes now used in soft drink advertisements?

- What themes can be found in newspaper editorials calling for tougher regulations of financial services?

- What themes can be found in training manuals given to new members of multi-level marketing organizations?

Wherever you have access to a series of images or words, you have the potential for doing qualitative research. However, notice the above examples: that the more carefully defined a project is, the greater the likelihood for it to yield useful data.

One great way to acquire narrative data is through interviews. This could be done individually in private, or the **focus group** approach can be used in which several participants (usually

between three and fifteen) are interviewed simultaneously. While quantitative research requires answers that can be scored (on a nominal, ordinal, interval, or ratio scale), the questions used in qualitative research are more open ended and designed to evoke a longer, narrative response in which the subject will achieve richer levels of exposition. The qualitative researcher must maintain a low ratio of talking to listening. While quantitative research requires the use of a highly structured interview, resulting in a specific score, qualitative research is more flexible. The interview should be only semi-structured, leaving the researcher the opportunity to follow up an answer with a branching question that may not have been included in the original protocols. One of the great benefits of the focus group is that individual group members start responding to each other's comments.

The important thing about all qualitative research, whether it is more of a case study or a series of interviews is that all of the (narrative and image) data be archived for future analysis. This may take months doing formal transcribing, but computer programs using speech recognition may be helpful.

Interviews are not the only sources of narrative data. Any compilation might have potential for qualitative analysis: what people write on their Facebook sites, what people tweet on Twitter, letters-to-the-editor in a local newspaper, posts on a discussion forum on Craigs List, written records about the subjects by the people who took care of them (e.g., teachers, trainers, supervisors, food servers, prison guards, nursing staff, sales people, customer service agents).

QUESTION #3.8: What are greatest challenges to doing qualitative research, and doing it well?

SHORT ANSWER: archiving and interpreting the data

An old joke is that performing qualitative research is like having a baby: fun to conceive, but hard to deliver. The ideas we get on what to study, and how to study those topics, is creative and exhilarating. The real work comes in collecting the data, archiving it, and interpreting it. The greatest challenge in qualitative research is data analysis. In quantitative research, this is simple and structured, use inferential statistics to compare the results to the null hypothesis and decide whether or not to reject the null.

Even the problem of selective observation and bias is present in these studies. The person who wrote up the case study (e.g., Margaret Mead, Sigmund Freud) may have looked for certain things that fit a certain theory, and ignored those data that did not fit. Again, disciplined subjectivity is necessary for gleaning valuable information from a case study. Good qualitative research does not seek to provide data to confirm the utility of rigidly defined categories or theories, but to continuously adjust such categories and theories as new data come in.

Qualitative research must be more open-ended and flexible, compared to the structure of quantitative research. While the latter achieves its goal of precision through the use of pre-arranged measures, the former achieves its goal of capturing the richness of meaning by

delicately balancing researcher neutrality with the ability to achieve an intimate relationship with the research subjects.

Due to all of the above factors, expect that qualitative research will take longer to complete than purely quantitative research. Something I have told my doctoral students for twenty years: if you want your dissertation to be completed in less than a year, make it purely quantitative.

Qualitative research does not provide statistical confirmation of a hypothesis, but can help clarify a hypothesis for future testing by quantitative means. Qualitative research cannot establish a cause and effect relationship between the events in a person's life: merely a record of what happened next, but also the richness of the subjective meanings of those events for the person.

The other great use of case studies, especially within the clinical branch of psychology, is that they serve to illustrate how to do something: diagnosis, treatment, etc. For consumer behavior, a case study might be a way to illustrate how to run a new ad campaign or roll out a new product.

QUESTION #3.9: What are the major ethical guidelines in the study of behavior?

SHORT ANSWER: don't put your subjects at risk

When psychologists treat patients, help clients, or perform research on subjects, there are important **ethical guidelines** to be followed. Many hospitals, companies, and schools have internal review boards or written policies which limit what kinds of data can be used in research. So, before you start distributing your questionnaire around the office, or sifting through the employment records, make sure that your research is permitted.

With all research subjects, human and animal, there is a need to **minimize harmful consequences**: risks, dangers, suffering, even embarrassment. The risks are not as great when studying consumers as when studying some of the topics in clinical psychology, where researchers have to make decisions about withholding treatments. The concern for minimizing risk to human subjects is one reason why many topics in psychology (e.g., loss of parents at an early age, brain damage) cannot be studied by experiments on human subjects. These topics can only be studied by surveys (which are not as good at eliminating other possible independent variables) or by experiments on animals. Indeed, one of the most controversial areas of scientific research is the justifiability of the pain (and even death) given to the more than twenty million animal subjects each year in U.S. laboratories. Much of these are related to marketing, because the research is about product safety.

With human subjects, there are guidelines about the confidentiality and anonymity of the subjects. **Anonymity** means that someone reading a case study of a patient should not be able to infer that the 46 year old male divorced accountant who received Prozac and cognitive-behavioral therapy for his depression is really Mr. Jones down the street. **Confidentiality** is

where the identity of the subjects is not even known to the researcher. Obviously, confidentiality may be impossible to achieve in interviews, but organizational policies may require that in the analysis of written records (especially when dealing with illness, employment evaluations, or school performance).

Another concern with human subjects is that of **informed consent**. Each participant should have a clear idea of what he or she is getting into upon agreeing to participate in a focus group, fill out a questionnaire, or be subjected to the manipulation of the independent variable. Ideally, the participant should also have the ability to quit the research at any point. It is less clear whether the subjects of an archival study must give formal consent before their data can be analyzed: the organization accumulating the data may have had a legitimate right to do so. It is doubtful that subjects in a field observation have to give formal consent, if the data are based upon public behaviors.

Yet another concern with informed consent is that certain experiments necessarily involve some degree of **deception** of the subjects because if they really knew what the research was really about, that would affect the way that they responded. It may be necessary to lead participants to think that the research is about one variable (e.g., attitudes about a particular product) when actually it is about another variable (e.g., prejudice about the ethnicity of the salesperson).

A related guideline is **debriefing**. After the research has been completed, subjects should have the opportunity to learn something about the results. If the subject has experienced any stress due to the research process, he or she should have an opportunity to get some counseling in order to overcome those problems.

Another guideline is **lack of coercion**. Subjects should not be forced to participate in the research. Prisoners should not be promised special consideration in parole hearings for their agreement to participate in dangerous experiments. Even students in psychology courses should not be required to participate in research as part of their grades, but should be given alternative ways of meeting course requirements.

UNIT 3: QUALITATIVE RESEARCH METHODS

flashcards & matching2

http://www.quia.com/jg/2522527.html

jumbled words game2

http://www.quia.com/jw/469829.html

millionaire game2

http://www.quia.com/rr/938593.html

summary paragraph2

http://www.quia.com/cz/466042.html

UNIT 3 TERMS: qualitative research methods

ANONYMITY: an ethical principle of research that the names of subjects should not be released

CASE: one particular subject (person) and the data obtained from that person

CASE STUDY: an in-depth study of one individual person (subject), household, company, or location; this qualitative technique can provide rich data but cannot confirm hypotheses

CONFIDENTIALITY: an ethical principle of research that information compromising the identify of the subjects should not be released; ethical guidelines require the maintenance of confidentiality

COERCION: forcible participation in a research study; ethical guidelines require the avoidance of coercion

CONSTANT: a measure that does not vary from subject to subject; everyone scores the same

CONTROL: (as a verb) to hold a variable constant; (as a noun or adjective) a comparison group in an experiment

CRITERION: a variable that we are trying to predict (e.g., whether the customer will purchase the product), usually a future outcome; criterion variables are always dependent variables, but not all dependent variables are criterion variables

DATA: plural word meaning the facts which have been observed

DECEPTION: when the researcher intentionally misleads research subjects about some aspect of the research project; ethical guidelines oppose unnecessary deception

DEPENDENT VARIABLE: the result, effect, observed behavior, attitudes, outcomes; decisions or choices made by the subject

EMPIRICAL: data gained through observation and measurement; the basis for scientific status

ETHICS: psychological research should attempt to minimize the risk to the subjects, avoid deception, obtain informed consent, and preserve confidentiality

FOCUS GROUP: a qualitative research technique in which subjects respond to open-ended interview questions, as well as to each others' comments

GROUP: a subsample; in experiments, groups are randomly assigned and treated differently

HAWTHORNE EFFECT: the behavior of subjects will be influenced by the observation of the subjects

HYPOTHESIS: a prediction advanced at the beginning of research; a presumed relationship between variables; plural hypotheses; hypotheses are best confirmed by quantitative research, but qualitative research can help suggest hypotheses

INDEPENDENT VARIABLE: causes or influences upon behavior; the variable manipulated in an experiment; background factors or external stimuli

INFERENCE: the process of reasoning from something observed to something else not directly observed (we observe behavior and then infer underlying mental processes)

INFORMED CONSENT: an important ethical guideline of psychological research: telling subjects the true nature of the research before they agree to participate

INTROSPECTION: self-reflection on one's own thoughts; earliest research tool, used by Augustine, James, Wundt; Watson criticized introspection as lacking scientific status

N: the letter n indicates the number of subjects in a sample or group

NARRATIVE DATA: the kind of qualitative data provided by interviews and examination of texts

OPERATIONAL DEFINITION: the way that a given variable is measured (or manipulated, randomized, or held constant); e.g., the variable of depression is measured by a score on a scale or a DSM diagnosis

ORGANISM: a person or animal being studied (the subject)

PARTICIPANTS: new term for subjects, the organisms participating in psychological research

POPULATION: the entire class of subjects studied (e.g., all residents of the geographical area; all current customers; all drivers)

PRECISION: data obtained by quantification of variables is precise; ratio scaling is the most precise, then interval, then ordinal, then nominal; narrative and visual data lack precision, but offer richness

PREDICTOR: a variable used to predict a criterion variable; this assumes a strong correlation between the variables; predictor variables may be stimuli, background factors, previous behaviors, or measures of aptitude or attitude

QUALITATIVE RESEARCH METHODS: non-quantitative techniques (e.g., case studies, focus groups); the resulting narrative or visual data have richness but lack precision

QUANTITATIVE RESEARCH METHODS: variables measured by nominal, ordinal, interval or ratio scaling such that the use of statistical analysis is possible

RANDOM: in research, selection or assignment that is left to pure chance (such as a lottery)

REPRESENTATIVE SAMPLE: a sample should be similar to the population on relevant background variables (e.g., age)

RESPONSE: how the organism acts; behavior; responses are dependent variables

RICHNESS: narrative and visual data may lack precision but they are rich insofar as they convey the subjects' personal meanings

SAMPLE: all subjects actually observed in the research (e.g., all people filling out the questionnaire; all rats running the maze)

SCIENTIFIC METHOD: empiricism; based upon observation and measurement of data

STIMULUS: something provided by the environment that the organism can sense; stimuli are independent variables

SUBJECT: the person or animal about whom we have data; the patient in the case study, the rats in the experiment

THEORY: abstract concepts used by scientists to help understand, predict, and control; data + theory = knowledge

VARIABLE: something that varies and can be measured empirically

VISUAL DATA: images produced by the research subjects; rich data requiring qualitative analysis