

Theories and Models in Psychology

Why We Care About Theories

The goal of science is to develop and test theories. Science does a lot of other things that don't seem like they have anything to do with theory development, but the bottom line is producing good theories.

Scientists and philosophers argue about what a theory really is, and what a good theory looks like. Some of the formal definitions include:

“A set of principles that explains and predicts many, but not all, observed relationships within a given domain of inquiry” (Stangor, 1998, p. 30).

“A formalized set of concepts that organizes observations and inferences and predicts and explains phenomena” (Graziano & Raulin, 2000, p. 37).

There are many more definitions, but they generally come down to these basic parts:

1. explain nature
2. predict events
3. tell us what to look for and how to look
4. tell us what our data mean

Theories explain why things are the way they are. Why does water become “hard” at 0°C? Chemical theories explain why compounds change state: what they are made of (atoms, molecules, etc.) and how they respond to change in energy (temperature). Why do people become racially prejudiced? Social psychology proposes a dozen theories to explain various aspects of this complex event, for example, it seems to reflect a cognitive bias that produces negatively valenced thoughts about others for whom we have poorly articulated cognitive schemata. “Why?” is the scientist's mantra, and when you stop asking *Why?* it's time to pack it in and turn on the TV.

Good theories go beyond just answering *Why?* to being able to predict events given the necessary information. A theory that explains why ice forms but can't predict when it will form has a problem. Psychological theories are better at explaining why than at making predictions, in part because behavior is multiply determined: it is the result of many complicated intersecting and interacting factors. Ice is not as simple as it seems at first, either: how about predicting the formation of ice from dirty water? salty water? water at various altitudes? water that is

moving?

Prediction is particularly important when theories involve real-world events that have consequences, such as the kinds of questions asked by applied psychology. Applied psychology includes the fields of psychology that attempt to solve real-world problems, sometimes in an academic research setting and sometimes in a direct-service setting such as a clinical practice or a business organization. A theory that predicts breakfast cereal purchasing behavior may sound trivial, but think of the \$\$\$\$. A theory that predicts suicide rates of college students is very important to a lot of people and can be used to plan interventions to prevent suicide.

Theories also tell us what's important to look for in our research and the appropriate methods for performing the research. For example, Freudian theories of personality tell us to look inside the person for internal events driven by basic needs such as sex and aggression, but social learning theory tells us to look outside the person at several kinds of experiences that can produce learning and personality characteristics. Freudian theory tells us that our research should focus on obtaining unconscious material via long-term psychoanalysis or projective methods (Rorschach "ink-blot" test). Social learning theory directs us to observing the social environment of the child or adult and perhaps using questionnaires to measure personality traits.

Because different theories want us to look for different things, sometimes theories "talk past each other," meaning that they look at different phenomena and worry about different aspects of the person. For example, both Freudian theory and social learning theory are concerned with problems of adjustment, but Freudian theory has traditionally been worried about "neurosis" (anxiety caused by unconscious unresolved conflicts) while social learning theory is more concerned with dysfunctional behavior. Social learning theories just don't care about internal conflicts of kinds Freudians worry about.

Finally, theories explain our data. One often hears statements like "the data speak for themselves" in connection with both informal and scientific research. The truth is, this is never true; the data are mute. The data only make sense in the context of a theory, and the same data can mean very different things from different theoretical perspectives. This is most evident when we look at the data first, then back up and try to figure out what theory or idea they support. Consider this experiment:

American and Japanese college students watched animated fish swim across a computer monitor. The display included several kinds of fish and many static, unmoving objects in the background (seaweed, sea shells, etc.). After watching this display for a while, the students were asked to recall what they had seen. The Japanese recalled as many fish as background objects, but the Americans recalled more fish than background objects.

OK, quick: what do these data mean? Do they speak for themselves?

Here's the theory from which the experiment was generated, in a very simplified form: The social structures and social experiences of Japanese and Americans are radically different in that Japanese live in a "tight" or "collectivist" social environment that includes a high degree of social interaction, social expectations, social

Data and Datum

Data is plural: "the data were inconclusive..." not "the data was..." One piece of data is a "datum" but the word is rarely used.

obligations, norms for social hierarchy, social control, etc. etc. American life is quite loose in this regard; we do our own thing (until the money runs out). This strong or weak social field, experienced since birth, affects basic cognitive processes, such as perception and memory. Japanese learn to attend automatically to the “social field” and this cognitive style generalizes to the nonsocial environment, hence they attend to the seaweed as well as to the moving fish. In the lingo of cultural psychology, Japanese are “holistic” and Americans are “analytical.”

Would you have expected such a theory given these experimental results? Without this rather bold and complex theory, the data are trivial and uninteresting (although it must have been fun to write the computer program).

No theory rests on just one experiment, and this experiment is just one of many that support this particular theory. Each of these experiments is different (and many are strange like this one), but the theory guides us to look at certain aspects of people’s behavior in these experiments and to interpret certain outcomes as support or nonsupport for the theory.

Could a different theory explain these data? New theories are often launched when someone finds a better way to explain existing data. However, old theories are rarely rejected when the data come out wrong; instead, people generally blame the poor quality of the research. In this experiment, there is in fact another explanation: perhaps the Japanese students simply tried harder. Remembering the moving fish is easy and an unmotivated observer could do it just as well as a motivated one. But only a motivated observer would also pick up the less-vivid background objects. So the other theory could start with the demanding Japanese educational system and suggest that it produces students who are running at 100% all the time. No slackers there. The American students don’t worry so much and take it easy when the consequences seem trivial. Who cares about seaweed? This theory is much simpler (parsimonious) than the holistic/analytic cognition theory. How would you do the next experiment to rule out the simple motivational explanation?

Types of Theories

Even within psychology, one type of theory does not serve everyone’s needs. Two general types of theories have evolved in science: inductive and deductive. Philosophers of science argue about which of these types of theories is better, and which type reflects what scientists actually do.

Inductive Theories

Inductive theories are “bottom up” or many-to-one, as the term *inductive* implies. Such theories are built by accumulating many bits of knowledge through research and eventually organizing these data to form generalizations describing the overall pattern of what has been found. Inductive theories usually don’t go too far beyond the data themselves, rather considering the generalizations to be sufficient; the theory is not too far away from what has been observed. By limiting the theory to the data, they don’t try to explain behavior through unobservable concepts (termed “constructs” or “hypothetical constructs”). B. F. Skinner’s behaviorism is a classic example of this kind of theory in psychology. Skinner’s theories are built

on the observations of thousands of learning experiments (many using white rats). From these observations he and his colleagues derived principles of learning that try to avoid looking inside the human or animal for processes that would explain the observed behaviors.

Deductive Theories

Deduction refers to “general to specific” logic, a “top down” approach to theorizing. A deductive theory begins with the development of general principles and constructs from which specific predictions can be made. For example, one could hypothesize that atoms are composed of three primary types of particles (remember? - protons, neutrons and electrons) and that these particles have a certain set of properties and interactions. From this theory we can deduce that certain kinds of atoms should bind together readily to produce molecules and some should be alone most of the time. Experiments can be performed to test this deduction (hypothesis) and if they don’t come out right, the theory should be rejected.

The social-cultural theory pleasantly called Terror Management Theory provides a great, if somewhat heavy, example of a deductive theory in social science. In a nutshell, the theory claims that humans are terrified of death because they have the cognitive capability and the knowledge to know that they will eventually die, no matter what. Culture provides a “defense” or “buffer” against this terror by giving humans a sense of social value and meaning within a large organization (society) that continues after the individual’s death. People are socialized to believe that, if you do the right thing and accept the right cultural ideas, you will make a meaningful contribution to your society. This sense of meaning not only reduces the terror of contemplating death, but is also reflected in personal self-esteem.

Affect and Effect

Don’t forget that “affect” is a verb and “effect” is a noun. “The moon affects the tides; the effect of the moon on the tides is great.”

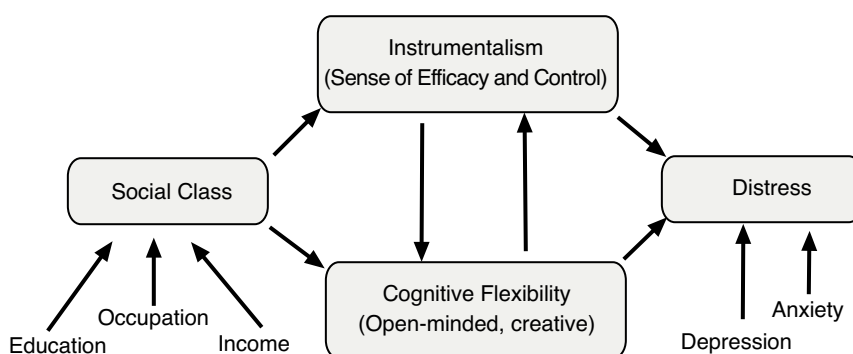
The “mortality salience hypothesis” was generated from this theory. This deduction from the theory proposes that when one’s mortality is made salient (by being reminded of it, or through actual threat), cultural symbols become increasingly important, that is, better defenses are needed. As a result, people under threat cling more strongly to their cultural symbols than when they are not under threat. Likewise, other people who promote, uphold, or accept one’s cultural symbols are liked more than they were prior to threat, and those who disagree with or challenge these symbols are disliked more. About 100 experiments have supported the validity of this and other deductions from the theory. For example, do you recall all the U.S. flags and “God Bless America” stickers that appeared on vehicles after the 9-11 terror attack? In a mirror image of this process, Islamic fundamentalism has increased in response to attacks by the Western nations on Islamic societies and to the encroachment of Western social and cultural practices on traditional Islamic values.

Terror Management Theory is a classic deductive theory because it begins with unobservable constructs like “cognitive representation of mortality” and deduces more specific, observable effects such as an increase in patriotism following an attack on the nation. Most psychology theories assume the operation of some kind of unobservable or hypothetical constructs that may be expressed in observable behavior (or self-reports of internal states such as “attitudes”).

Mirowsky and Ross’ (1989) theory of social class and psychological distress (see

figure) presents an example of a more down-to-earth deductive theory. According to this theory, middle class people are higher than working class people in instrumentalism, defined as a person's sense of self-efficacy (ability to do things well) and control (feeling of being in control of one's life, versus a passive and helpless victim). Instrumentalism comes from experiences as a child in a family, higher education, and experiences at work. People high in instrumentalism are usually actually higher in efficacy and control (i.e., it's not just in their heads). Higher

instrumentalism in turn helps people deal with routine and acute stresses of living, so they are less prone to depression and chronic anxiety, especially when life gets difficult. The theory claims that social class affects distress, but the effect is due to its effect on instrumentalism (and cognitive flexibility). This theory allows that anything else that could increase instrumentalism would also reduce distress.



Model of Social Class and Psychological Distress. This model illustrates the effect of social class on distress (depression and anxiety). Instrumentalism and cognitive flexibility are mediators in the model. (From Mirowsky and Ross, 1989)

Functional Theories

After reading the description of Terror Management Theory described previously, you might have wondered where the theory's original authors came up with the basic constructs (terror at the thought of death, cultural buffers, etc.). The answer is that these constructs are often developed through a process of induction. The theorist looks at a lot of events or data and uses them to come up with generalities that in turn become the seeds of deductive theories. Charles Darwin's theory of evolution illustrates this process nicely: Darwin traveled widely in his youth, observing wildlife in exotic settings that few Europeans had yet seen (e.g., the famous Galapagos Islands). He went back to England and thought about these observations for decades during which he developed his theory of evolution. From this theory, many specific evolutionary effects are deduced and tested using new research data.

www.darwinfoundation.org

The term "functional theory" is used to describe this blending of inductive and deductive approaches. Most psychological theories are functional theories in that they begin as inductive collections of observations of the surrounding world, hypothetical constructs are developed to explain the observations, and the resulting deductive theory is used to generate hypotheses. Induction is often the first step in theory-building in social science because scientists live in a society and observe the world around them. They wonder "what's going on here?" then try to develop theories that answer the question.

Falsifiability

Good theories are falsifiable, meaning that they are stated in such a way that research studies could show them to be incorrect. Theories that can't produce readily testable, rejectable hypotheses are held in low esteem by scientists. For

example, Terror Management Theory would be disproved if research found that the threat posed by American's 9-11 trauma decreased people's attachment to symbols of American national culture (e.g., people suddenly purchased fewer flags). Mirowsky and Ross' social class-distress model would be disproved if one of the links in the model showed the opposite effect, e.g., if a study of Harris Corporation employees revealed that the managers had lower instrumentalism than the assembly workers. Freudian theory is generally considered to be deficient in this regard because it is too slippery to be tested through this deductive process: too many of its propositions cannot generate clear, testable hypotheses.

The point was made in the Philosophy of Science chapter that unsupportive data don't actually result in the rejection of a theory. Put yourself in the shoes of a researcher. After spending five years of your life working on a theory, you come up with a "wrong" result, such as finding that the Harris assembly workers in Palm Bay are higher in instrumentalism than the electrical and computer engineers. This findings makes no sense from the perspective of the model and goes against other findings in related theories involving similar constructs. You have three choices: (1) reject the theory; (2) assume the methods used in the study were flawed; (3) assume it was a fluke of some kind. Option (1) never happens because (2) is so common in social science and (3) can happen now and then. However, if several studies using different methods in different places also fail to support the theory, it will eventually be taken as disproved. The most powerful way to disprove a theory, as mentioned previously, is to find a new theory that explains the data better.

Where Theories Come From

Theories do not emerge, full-blown, out of the minds of brilliant scientists. Instead, most theories are to some extent derived from earlier theories and from ideas that are "floating around" in the scientific community. Sir Isaac Newton's famous phrase, "If I have seen further it is by standing on the shoulders of giants" (1676) illustrates this idea well. Social science theories are particularly derivative because social scientists live their subject matter. Also for this reason, they are usually consistent with the general intellectual milieu of the surrounding society.

Much of the content of any theory is not stated explicitly in the theory itself, but is "inherited" from the intellectual milieu. For example, Terror Management Theory was developed from the writings of the cultural anthropologist Ernest Becker (1970s) and the neo-Freudian personality theories of Otto Rank (1950s). Because it derives its research methods from the generally accepted research style of American social psychology, the theory need not justify how it obtains and interprets data. These features are inherited from the intellectual environment in which it operates. (Readers familiar with object-oriented computer programming will immediately recognize the analogy.)

A recurring criticism of social science theories is that they are too strongly tied to the culture in which they originate and therefore are as much cultural products as scientific products. For example, modern psychology focuses on the individual and promotes individual freedom, self-esteem, actualizing the self, individual responsibility, the locus of mental illness in the person, and so on. This individualistic orientation reflects the individualism of Western society: it is of, by and for the West. Unfortunately, it only explains the thought and behavior of a minority of living humans, most of whom do not live in individualistic societies. Indigenous psy-

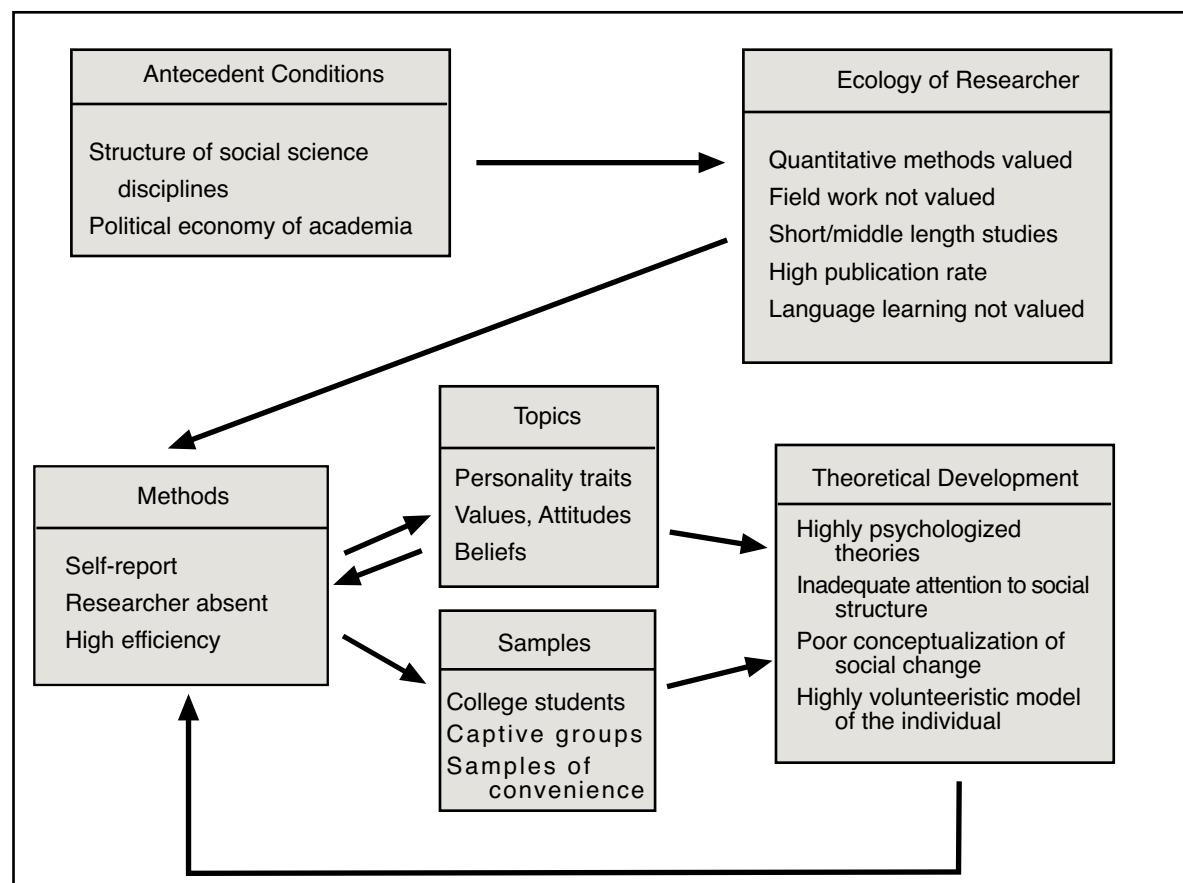
chologists (see the Philosophy of Science chapter) are particularly sensitive to this cultural basis of psychology and charge that what we think of as “the psychology” is really only an indigenous psychology of our own society. They may be right.

Models

The term “model” is used in several ways: as a stand-in for the word “theory,” as a mini-theory, and as a simplified way of representing something that is very complicated such as a theory.

Theories are often referred to as models in an informal way. We say “Kohn’s model of social class and values” when we mean “Kohn’s theory.” Sometimes a model is a wanna-be theory, that is, it is a theory that is too simple, undeveloped, or tentative to be given the status of formal theory. The term “minitheory” is occasionally used in this case. For example, my theory of how methods and theories interact in cross-cultural psychology is represented as a model (see figure) but is not developed as a theory.

The most interesting use of “model” is as a simplified representation of something complex. Models of this kind are used in all the sciences. No doubt you have seen a physical model of the double-helix DNA strand, complete with perfectly round



Gabrenya’s model of the problem with cross-cultural psychology. This brilliant model shows how the discipline (psychology, anthropology, etc.) affects the work situation of the researcher (e.g., will living in the jungle with the natives be seen as good or weird), how this situation affects the kinds of methods he/she can use, and then how methods interact with what can be studied, how it can be studied, and finally the implications of the research on the kinds of theories that are produced. Theory feeds back to determine methods.

colored balls representing the four kinds of amino acids. DNA doesn't actually look like this, but the model is sufficient to communicate the main features of the strand for the purpose of discussion and teaching. Museums often feature "dioramas" that model, say, the African savannah or a Medieval village. These models simplify reality tremendously but they provide a general representation of the real thing. The model is designed to highlight what's important to the observer and leave out the rest.

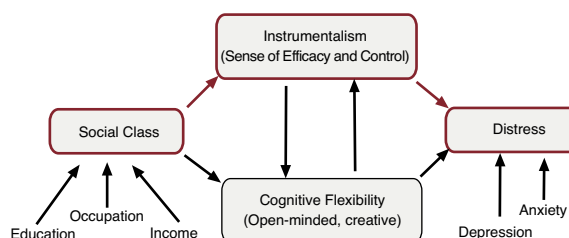


In psychology, models are more often pictorial: boxes and arrows on paper rather than 3-D creations (the obvious exception being in physiological psychology). They usually show causes and effects and the processes that mediate cause and effect. Researchers draw models as a way of thinking through a psychological process or of communicating their thoughts to others. The cliché "a picture is worth a billion words" certainly applies here in that it would take a great deal of tedious writing to spell out the ideas that a model presents so efficiently. Sometimes they are used as pictorial representations of theories to help communicate and discuss the theory. However, models are not necessarily theories: they are often incomplete and informal, presenting analogies rather than formal statements and well-developed constructs. Models provide food for deep thought.

The term "model" is also used in data analysis and statistics, as you will see in a later chapter. In data analysis, a model is a mathematical representation of the sort of models discussed in this section.

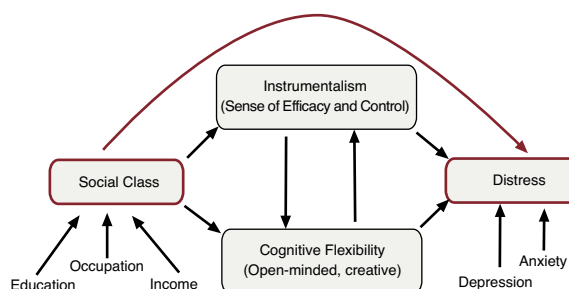
Mediators

Theories and models usually represent complicated psychological processes. In psychology, one thing does not typically cause another thing directly. Instead, it does so through intermediate processes termed "mediators." One of the most important classes of mediators in modern psychology is "cognitive processes" or "cognitive representations." In simplest form, the external stimulus is perceived and processed by the person and a behavioral response is observed. Here, the moderator is the cognitive processing. (No theory is actually this elementary.) Mirowsky and Ross' theory of social class and psychological distress, described above, includes two cognitive mediators. The effects of social class on distress are mediated by instrumentalism and cognitive flexibility.



Mediated Model. Social class affects distress indirectly via its influence on instrumentalism (red).

In Terror Management Theory (TMT), mortality threat increases attachment to cultural symbols via the intermediate event of increased anxiety. The author's more complex model of the relationships among disciplines, research methods, and theories in cross-cultural psychology includes several mediators and a feedback loop (see figure).



Direct Effect Model. Social class affects distress directly, without affecting instrumentalism (red).

Do you see how easy it is to flip between the words "theory" and "model"? The main difference is that "theory" refers to a more formal, verbally presented and highly articulated statement

of the relationships among the constructs, whereas “model” refers to simplified, usually pictorially expressed, presentations of relationships among some of the concepts in the theory. In the theory, we refer to the concepts as hypothetical constructs; in the model, we are usually talking about the concepts represented as measurable variables.

Without mediators, theories and models are not very interesting. The mediators answer part of the *Why?* question by telling us how it is that the initial cause can produce the final effect. In research, it is sometimes possible to measure the mediators as well as the causes and effects, allowing us to determine if the mediator really belongs in the model. In TMT, measuring the anxiety variable allows us to determine if it really does mediate the threat-symbols relationship. In the Mirowsky-Ross distress model, measuring instrumentalism allows us to determine if the effect of social class on distress goes “through” instrumentalism or “around it.” In the latter case, we would say that social class has a direct effect on distress rather than an indirect one via the mediator.

Moderators

Moderators are conceptually quite different from mediators although the words sound similar. Moderators “modulate” the effects of other parts of a model on each other. They represent the circumstances under which the effects take place, the organismic factors (features of the person or animal) that constrain the effects, and other outside disturbances that can affect the relationships among the theory’s constructs.

For example, the Mirowsky-Ross distress model is designed for modern Western societies. One wonders if instrumentalism would reduce psychological distress in a culture in which individuals normally have little control over their lives, such as a traditional agricultural society like the wet-rice growing areas of southern China up to a few years ago. In this sort of society, instrumentalism as a personality trait or cultural value might be maladaptive and might lead to dissatisfaction, frustration, social maladjustment, conflict, and rejection. In this case, we could say that culture moderates the relationship. Less drastic moderators are often found in factors such as gender and age. For example, perhaps alcohol causes aggression, but only for men. For developmental reasons, many models designed for adults don’t work for children, so age is a taken-for-granted moderator in many theories.

Research in social science and psychology always assumes that many moderators are at work simultaneously. These moderators are often routinely measured (e.g., gender) and then looked at in the data analysis. Because so many of the moderators are unknown, it is very easy to perform an experiment that could have yielded a positive result if some other values of moderators variables had been used, for example, if the study has included both males and females or the room had not been so cold. Conversely, a positive experimental finding might unexpectedly fail due to the intervention of an unknown, unforeseen moderator. Indeed, the world is incredibly complex, so every model is awash in other variables that can moderate its effects. When mod-



Rice seedlings. The green rectangle in the foreground is a rice seedling paddy used in wet-rice agriculture. When the seedlings reach a certain size they are transplanted to larger paddy fields. Timing is everything; if you don’t conform to the growing schedule, you starve to death. Self-actualization does not contribute to responsibly fulfilling one’s role in the agricultural system. (photo: central Taiwan)

erator variables are discovered, the scientist must eventually ask *Why?* and try to incorporate the moderator into the model. If your experiment only works when the walls are blue, you had better figure out why wall color interacts with your other variables.

An example of this progression of a construct from a bothersome moderator to inclusion in a model or theory can be seen in the social psychology of attitude-behavior relationships. Social psychologists had great difficulty predicting behavior from attitude measures. Eventually it became clear that attitudes affect behavior when other determinants are weak, particularly social influence. So when you buy toothpaste, your purchasing behavior is mainly affected by your attitudes toward the toothpaste brands and types. When you buy a shirt, you consider how much others will like it and your own attitude toward the shirt may be of lesser importance. A brilliant breakthrough occurred when social psychologists finally faced up to the simple fact that social influence was not just a moderator of the attitude-behavior relationship, but deserved to be included in the theory as an additional determinant of behavior. Behavior is multiply determined.

Errors and Issues in Theory Building

Reification

Social scientists warn against the error of “reification.” Reification has several related meanings in social science, the most basic of which is believing that an abstract theoretical system is in fact a physical reality. For example, many modern psychological theories are based on processes in the “cognitive system.” These theories incorporate elements of the cognitive system such as “encoding in long term memory” and “semantic inference.” The cognitive system itself is represented by models that feature “nodes” and “associations” drawn as boxes and arrows. However, these systemic components don’t actually exist in the brain as physical entities; instead, they are abstract, hypothetical constructs that we use to explain thought and behavior. We might say “humans think *as if* the system looked like this” but we know that the components of the system don’t really exist physically. Neurological research is making some progress in identify brain structures and neural functions that correspond to these constructs, but cognitive theory itself does not correspond to a physical reality.

Reification is used in social science in a more complicated way. At the base of this usage is the idea that our conceptualization of the social world corresponds erroneously to something that is real or natural. By “conceptualization” I am referring to both social science theories and to societal beliefs (ideology) held by members of a society. In social science, it is the assumption that our theory about how some part of society—say, the economic system in capitalist nations—corresponds to some actual system, that is, the assumption that the system actually exists as described by the theory in the real world. In fact, there is no capitalist system, but rather we participate in an incredibly complicated set of economic interactions that, at some abstract level, are lumped together as “capitalism.” One problem of reification for social science is that once the theorized system is assumed to really exist, we may stop looking at the components of the system in other ways, that is, the reified system constrains our thought about what’s really going on. For example, if we reify capitalism we may not recognize economic relationships in

society that don't fit the mold.

Reification of societal beliefs occurs when people (scientists as well as normal people) assume that human-made aspects of the social world are natural. The human-made social world includes our political ideas and institution, social norms and customs, economic systems, and at the broadest level, the course of human history. Believing that these human products are inherent, unavoidable, predestined qualities of either nature, or "divine will" reifies them—it gives them a reality or inevitability that should not be assumed. For social scientists, this kind of reification can skew theories to reflect "what is" rather than "what could be." For example, this reified logic might go:

"Because we have a social class system, social class systems are apparently natural characteristics of human societies, and because they are natural, we have to base theories about social structure on this fact of nature."

For citizens, reification can imply an uncritical acceptance of the status quo. When the current political or economic situation is accepted as the "natural way," "god-given way," or "only way possible," motivation to change the situation is greatly eroded. Social stability in societies comes in part from enculturating its members to accept the basic ideology of the culture as if it were "as natural as breathing," but the downside is that social change can be stunted and power relations are reified:

"It is natural that women should stay home and tend the babies, and that men should rule the household."

Ecological Fallacy

The ecological fallacy is important when groups of people are compared to each other on nomothetic measures, such as in cross-cultural or gender research. Starting at the empirical level, what would you infer from this finding:

Chinese score an average of 44.5 on a measure of allocentrism, and Americans score 25.2 on a 50-point scale.

This finding reflects much of the research on allocentrism (sometimes called psychological collectivism, or just collectivism). Allocentrism is a set of values and beliefs that give primacy to the social unit (family, clan, community, nation) over the individual. For example, allocentrics are more concerned than idiocentrics (individualists) about the welfare of their family members and about how others view their behaviors.

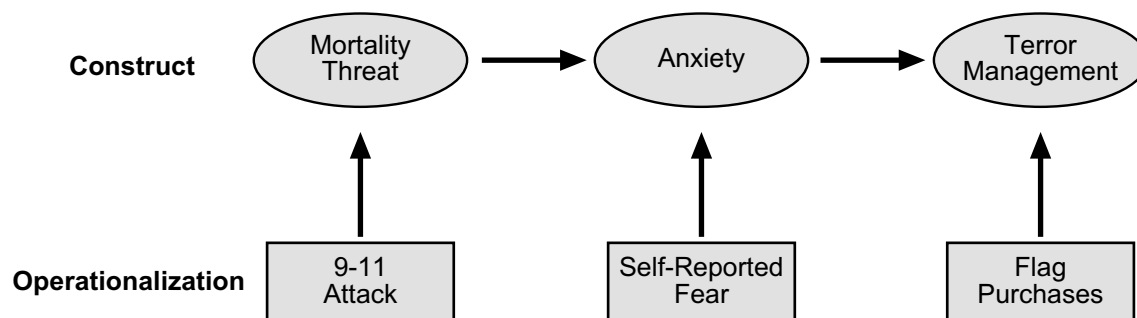
An ecological fallacy would be committed if we were to assume that this mean difference implies that every Chinese person is more allocentric than every American. In reality, there is a great deal of overlap such that many Americans are more allocentric than many Chinese despite the large average difference. The ecological fallacy leads us to oversimplify our theories by not taking into account diversity within the groups we study. It is a form of stereotyping, in which every member of a group is assumed to be the same.

Parsimony

Good theories try to explain the most with the least. They limit their concepts or models to the least number of constructs necessary in order to adequately explain and predict the phenomena of interest. This mandate is termed “parsimony” or “Ockham’s Razor” after the 14th Century philosopher William of Ockham. Ockham is a town near London just off the M25 expressway. (Use the razor to cut out the unnecessary concepts...) Colloquially, we use KISS for this purpose: Keep it Simple and Short, or Keep it Simple, Stupid. Simplify, simplify...

Operationalization of Constructs

Theories would be lost in thought and empirical research would not be possible if we could not represent our constructs in an objective, observable manner. This expression of the construct onto a thing that we can see or do or measure is called operationalization. The thing itself is an “operation.” For example, “intelligence” is a construct that cannot be seen directly, but we assume we can operationalize it as IQ, a measure from an intelligence test. We can operationalize it in many other ways as well, so psychologists debate which operationalization represents the construct best. In an experiment, we might want to manipulate a construct such as “anxiety” to see how it affects another construct such as “affiliation.” Do people stick together when they’re anxious? Anxiety could be



Operationalization of the Mortality Salience Hypothesis of Terror Management Theory. In this type of model, ovals represent constructs or variables that cannot be directly observed or measured and rectangles represent operationalizations or indicators of the construct. Arrows point from the operationalizations to the constructs that they indicate.

operationalized by telling some of the research subjects that they will be asked to sing to an audience of fellow students in a few minutes (experimental group) and telling others that they will be asked to sing alone in a sound-proof room without any listening or recording devices (control group). Affiliation could be operationalized by giving the subjects a choice of waiting alone before singing or waiting with someone else. Again, one could argue about whether the anxiety operationalization was the best one and how other operationalizations would yield different results (this is a question of external validity, addressed in a later chapter). The same is true for affiliation.

When constructs are brought “down” from theories to research studies they are called variables. Variables are discussed in greater detail in a later chapter. If the construct in a theory is anxiety the corresponding variable in an experiment might be called something like “amount of anxiety,” indicating that in the experiment

the anxiety was intentionally controlled or manipulated to see how it affected something else. Some subjects were led to experience more anxiety than others. Because the variable is not the construct itself, we try to think of the variable in terms of the operations used to produce it so that we don't prematurely or naively assume that our operationalization was definitely the correct one or the only possibility. This definition of the variable in terms of operations is called an operational definition. In the lingo of research, we might say, "in my study I operationalized anxiety as anticipation of singing in front of others," or "the operational definition of anxiety in my research was expectation of social humiliation." More on this, later.

Operationalism is Something Different

Sometimes the construct is thought of purely in terms of an operational definition, that is, the construct is defined in terms of the operations used to represent it in research studies, and nothing more. This is something completely different. Now we don't really have an abstract construct, just an operation. For example, anxiety would be nothing more or less than anticipation of singing in front of others (implying many different kinds of anxiety to correspond to many different operations). In philosophy of science, this approach to theory is called operationalism. This idea is of course ridiculous:

"...operationalism in the extreme version ... would lead to the impoverishment of the scope of scientific theories, [and probably] to the total breakdown of all scientific communication." (Harris, 1979, p. 14).

In psychology, inductive theories take a position closer to operationalism because they do not consider the construct and its operationalization to be necessarily distinct. Deductive (and therefore also functional) theories do make this distinction and are far removed from operationalism.