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## Explanation, Cognitive Psychology of

An explanation is a judgment about why an event occurred. Explanations are drawn for numerous and varied events (e.g., the behavior of others, the weather, the movement of planets, natural disasters). Much of the psychological research and theory on explanation comes from work on Attribution Theory, which is the study of how people make judgments about others and themselves. Despite its name, attribution theory is not a single theory, but a large collection of minitheories and investigations. This article summarizes some of the major perspectives, theories, and research topics within this large body of work on the psychological study of explanation.

The study of explanation is an integral and well-researched topic in psychology, and understandably so. Explanations are ubiquitous in everyday life (e.g., Hsiang-Ling did well on the exam because she has wonderful quantitative skills), they influence affect (e.g., I'm angry at Joe because he intentionally broke my favorite vase), and they determine social behaviors (e.g., I helped Margaret because I thought she was really trying her best to succeed). It should be noted, however, that there are important differences between the lay person's goals in generating explanations and the scientist's goals in studying explanations. Lay people typically desire explanations that are understandable, informative, accurate, consistent with beliefs and expectations, and personally satisfying. In contrast, scientists are interested in the psychological processes that determine what kinds of explanations people generate, as well as the affective, cognitive, and behavioral consequences of drawing different kinds of explanations.

### 1. Heider, Founder of the Psychological Study of Explanation

Interest in explanation processes and consequences can be traced at least as far back as the fourth century BC, with Aristotle's book on *The Rhetoric*. However, if a particular individual had to be singled out as the founder of the scientific study of explanation, it would surely be Fritz Heider. Heider's insights (Heider 1944, 1958) laid the foundation for much of the research and theory in the study of explanation. Consider three of his important ideas. First, Heider suggested that people want to understand the stable causes of a given behavior so that they can predict future behavior. He wrote, 'It is an important principle of common-sense psychology ... that man grasps reality, and can predict and control it, by referring transient and variable behavior and events to relatively unchanging underlying conditions, the so-called dispositional properties of his world' (1958, p. 79). Thus, just as astronomers may seek to explain the orbit of planets

so that they can predict their future positions in space, people seek to explain the actions of individuals so that they can predict the future actions of those individuals. Second, Heider emphasized the distinction between personal and situational causes. This is a fundamental distinction in the study of explanation, and it seems to capture a great deal of common sense reasoning as well. For example, if an athlete performs poorly, one might decide that something about the athlete is the cause or one might decide that something about the field conditions is responsible. Third, Heider suggested that people tend to focus on personal causality and underestimate the influence of the situation. Heider (1944) wrote: 'Often the momentary situation which, at least in part, determines the behavior of a person is disregarded and the behavior is taken as a manifestation of personal characteristics' (p. 361). This tendency is what later came to be called the correspondence bias (see below). Heider's insights provided the impetus for numerous theories and investigations. Two of the most well known theories are Kelley's Covariation Model and Jones and Davis's Correspondent Inference Theory.

## 2. *Intuitive Scientists and Logical Explanations*

The theories of Kelley, and Jones and Davis were formulated during a time when many psychologists viewed people as logical, rational, 'intuitive scientists.' Thus, it is not surprising that both theories emphasize logical principles that a sophisticated person could use to make rational judgments. This logical perspective has been very influential in the study of explanation, although, as described below, it is not the only perspective that theorists have found useful.

### 2.1 *Kelley's Covariation Model*

Suppose an acquaintance of yours, Torsten, says to you, 'You have to try Kjelleren, that new restaurant on Storgata. It's great!' This recommendation can be explained in several ways. Something about the restaurant may be the cause, such as its fine food or pleasant atmosphere. Something about Torsten may be the cause. Perhaps he is easily impressed and raves about every restaurant he tries.

Kelley (1967) suggests there are three types of information that you should consider. First, you should consider consensus information. Consensus pertains to how other people react with regard to the target object. If others also rave about Kjelleren, consensus is high. If they dislike Kjelleren, consensus is low. Second, you should consider distinctiveness information. If Torsten recommends every restaurant he samples, his recommendation on this occasion is not very distinctive (distinctiveness is low). But if he rarely recommends restaurants, his comment is dis-

tinctive (distinctiveness is high). Finally, you should consider consistency information. If Torsten's reaction has been positive every time he has been to Kjelleren, consistency is high. But if he disliked Kjelleren previously, consistency is low.

Different combinations of these three types of information suggest different conclusions. For example, suppose others do not seem to like Kjelleren (low consensus), Torsten often recommends restaurants (low distinctiveness), and Torsten often recommends Kjelleren (high consistency). This suggests that something about Torsten is the cause of his recommendation. In contrast, suppose others also like Kjelleren (high consensus), Torsten rarely recommends restaurants (high distinctiveness), but Torsten consistently recommends Kjelleren (high consistency). Now it seems that something about Kjelleren is the cause.

Of course, sometimes people lack the information, ability, or motivation to perform such a sophisticated analysis. In this case, one may use the discounting principle, which states that 'the role of a given cause in producing a given effect is discounted if other plausible causes are present' (Kelley 1972, p. 8). For example, suppose one sees a person who appears anxious. If it is known that an anxiety-provoking event is present, one should discount the person's personality as a cause of the anxiety displayed on this occasion.

### 2.2 *Jones and Davis's Correspondent Inference Theory*

Suppose the following three behaviors are observed. First, Elena is leaving a funeral and she appears sad. Second, Jason declines a promotion in the company where he works. Third, at a party Edward is arguing vehemently that it is every person's responsibility to conserve energy, recycle, and protect endangered wildlife. What should one conclude about the personalities of these individuals? Jones and Davis's Correspondent Inference Theory (Jones and Davis 1965, Jones 1990) suggests that two pieces of information are important to consider. First, one should consider the expectedness or normativeness of the behavior. When people behave in ways that are normative for the situation (e.g., sad Elena leaving the funeral), their behavior is relatively undiagnostic of their personalities. Second, one should consider the clarity of the behavior with regard to its implications (there are numerous reasons why Jason might have declined the promotion). When many explanations are possible, one cannot be certain which is the correct one.

However, when behavior is atypical and has clear implications, a personality inference can be drawn. In the case of Edward, although one could be mistaken, a reasonable inference is that his behavior reflects an underlying disposition, specifically, that he is an environmentalist. This is a correspondent trait inference. In Jones's words, 'a correspondent inference is

a straightforward extrapolation from the behavior observed: the behavior is seen as corresponding to or reflecting an underlying disposition of the actor ... for example, to call a person hostile after observing a hostile act would be to draw a correspondent inference' (1990, pp. 46-7).

### 3. *Cognitive Misers and Top-of-the-head Explanations*

As mentioned above, the theories of Kelley and Jones and Davis emphasize logical principles that a sophisticated person could use to make rational judgments. Research suggests that people can use such logical principles, and they may do so when they have the time and motivation (perhaps during a jury deliberation). However, people may not typically use such logical principles when they formulate explanations. Some theorists suggest that although people can be 'intuitive scientists' who use logical rules, they can also be 'cognitive misers' who do not expend many cognitive resources unless accuracy is at a premium. Research from this perspective reveals that people often draw relatively unsophisticated 'top-of-the-head' judgments that are heavily influenced by whatever causal force is the most obvious. For example, when an actor interacts with others who are moving or brightly illuminated (McArthur and Post 1977), the actor's behavior is attributed more to situational factors.

### 4. *Story Understanders and Theory-driven Explanations*

Yet a third perspective is that explanations can be viewed as part of the process of understanding information in that explanations often rely on background information and common sense reasoning (see Schemas, frames and scripts, in cognitive psychology). For example, if one learns that Charles, who is health conscious, asked to be moved to a different table in a restaurant, one might surmise that he wanted to sit farther from people who were smoking. On the other hand, if one learns that Diederik, who was sitting in a coffee shop reading a new novel, asked to be moved to the table farthest from the crowd, one might speculate that he wanted to find a quiet place to read. In everyday life we often use information drawn from prior knowledge and previous experiences, and this information influences explanations as well (e.g., Read 1987). Research from this perspective tends to be more specific in that it focuses on particular knowledge structures (e.g., the restaurant script) rather than content-independent rules that can be applied to any behavior. However, it has an advantage in that the explanations that are produced are more natural ('Diederik wanted a quiet place to read his book' rather than 'Something about Diederik is the cause').

Of course these perspectives need not be mutually exclusive, and some theories make use of more than one (e.g., Hilton and Slugoski 1986).

## 5. *Bias in Explanation*

Given the emphasis on logical principles in the early work on explanation, it is perhaps not surprising that deviations from completely rational explanations have captured the interest of explanation theorists (see *Decision Biases, Cognitive Psychology of*). Two of the most well-known biases are the correspondence bias and the self-serving bias.

### 5.1 *The Correspondence Bias*

The correspondence bias, also known as the fundamental attribution error, (see Gilbert and Malone 1995, Jones 1990 for reviews) refers to peoples' tendency to infer that personality corresponds to behavior. For example, if Anne behaves in a friendly manner, we may infer that she has a friendly personality, and if Neil behaves in an aggressive manner, we may infer that he has an aggressive personality. Of course, often personality does correspond to behavior, and so the correspondence bias need not be an error. However, research suggests that even when there is good reason to think that a behavior is substantially situationally driven, people still tend to infer that behavior reflects personality. For example, even though we know that actors and actresses are only playing roles, we may still infer that their personalities correspond to the behavior of the characters that they play.

### 5.2 *The Self-serving Bias*

The work described thus far has addressed explanations for the behavior of other people. However, considerable research has also been conducted on explanations about oneself, particularly on how people explain their own successes and failures. One of the notable findings of this research is that many people are self-serving in their explanations in that they tend to take more credit for their successes than their failures (see Bradley 1978 for a review). For example, if Robert runs well in a 400m race, he might indicate that his high ability is the cause. But if he runs poorly, he might blame his performance on the field conditions. Interestingly, this self-serving tendency extends to explanations about the successes and failures of in-group members (e.g., Hewstone and Ward 1985). So, for example, Robert might also assign his team-mates relatively more credit for their successes and relatively less blame for their failures. However, as described below, this self-serving tendency is not found in all populations.

## 6. Process Models of Explanation

Much of the research on explanation processes has emerged from the Jones and Davis tradition. Just as their Correspondent Inference Theory sought to describe how people draw inferences about personality, so most process models seek to describe the mechanism by which people use information about behavior and situational forces when drawing inferences about personality. Several models suggest that dispositional inferences are drawn through a series of stages that differ in their degree of automaticity (see). For example, Gilbert et al. (1988) suggest that people first categorize behavior (Susan appears anxious), next they characterize personality (Susan has an anxious personality), and then they correct for the influence of the situation (perhaps some anxiety-provoking situation is making Susan anxious; she may not be an anxious person after all). Gilbert suggests that the third stage requires more effort than the first two, so when cognitive resources are scarce, people may fail to correct their characterizations completely and so display correspondence bias. Numerous investigations provide support for this view. Although sequential models of explanation have been the norm, a parallel distributed processing approach (see *Cognition, Distributed*) may become more common in the future.

## 7. Cultural Differences

Although the majority of research on explanation has been conducted with North American or European participants, interest in cross-cultural research has been waxing, and as researchers in different cultures find it easier to collaborate, productivity in cross-cultural research will probably continue to increase. One cross-cultural finding is that people in individualist cultures (e.g., US, Great Britain) prefer dispositional explanations for behavior, but people in collectivist cultures (e.g., China, India) often do not, and sometimes collectivists prefer situational explanations (e.g., Miller 1984). It should be noted, however, that research of this type has been conducted in relatively few nations; more research is needed. Less research has been conducted on the correspondence bias, but the extant work suggests that this bias may be cross-cultural, although more robust in individualist cultures (e.g., Choi and Nisbett 1998). There are also cultural differences in the degree to which explanations are self-serving or group serving (e.g., Hewstone and Ward 1985), but these differences do not seem to fall as easily along individualist/collectivist lines.

## 8. Explanation Consequences

The study of the consequences of explanation is itself a substantial area of study. Research suggests that both emotional states and achievement motivation are

influenced by explanations for success and failure (e.g., Anderson et al. 1996). For example, if Veronica receives a failing grade on a literature paper and concludes that her failure was due to a lack of effort, she may be motivated to work harder next time. On the other hand, if she concludes that she has no talent for writing, she may feel depressed and helpless. Indeed, the study of such explanations is a major topic in the clinical study of depression (see, Abramson et al. 1989). Moreover, not only are internal and uncontrollable explanations for failure likely to lead to depression, but people who are depressed are also more likely to draw such conclusions than the self-serving explanations characteristic of nondepressed individuals.

*See also:* Causation: Physical, Mental, and Social; Comprehension, Cognitive Psychology of; Explanation-based Learning, Cognitive Psychology of; Functional Explanation: Philosophical Aspects; Interpretation and Translation: Philosophical Aspects; Rational Choice Explanation: Philosophical Aspects; Verstehen und Erklaren, Philosophy of

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