Selective Exposure Theory

Twelve Wikipedia Articles

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Selective exposure theory

Selective exposure theory is a theory of communication, positing that individuals prefer exposure to arguments supporting their position over those supporting other positions. As media consumers have more choices to expose themselves to selected medium and media contents with which they agree, they tend to select content that confirms their own ideas and avoid information that argues against their opinion. People don't want to be told that they are wrong and they do not want their ideas to be challenged either. Therefore, they select different media outlets that agree with their opinions so they do not come in contact with this form of dissonance. Furthermore, these people will select the media sources that agree with their opinions and attitudes on different subjects and then only follow those programs.

> "It is crucial that communication scholars arrive at a more comprehensive and deeper understanding of consumer selectivity if we are to have any hope of mastering entertainment theory in the next iteration of the information age. Essentially, understanding selective-exposure theory is a **prerequisite** for constructing a useful psychology of entertainment."
>
> Bryant and Davies, 2006[1]

Foundation of theory

Propaganda study

The Evasion of Propaganda

When prejudiced people confront anti-prejudice propaganda involuntarily, even though they might avoid the message from the first time, the process of evasion would occur in their mind. Cooper and Jahoda (1947) studied how the anti-prejudice propaganda can be misunderstood by prejudiced people. When the prejudiced reader confronted the Mr. Biggott cartoon, which contained anti-minority propaganda, their effort to evade their feelings and understand Mr. Biggott's identification with their own identity would bring about misunderstanding. This kind of evasion occurs because of what individuals often face to accomplish uniformity in everyday life. There is a fear to be isolated from what they belong and also threat for shivering their ego. Therefore, the concept of selective exposure was in the same thread with small effect studies in mass communication in 1940s.

Cognitive dissonance theory

Before the selective exposure theory was put forward, Festinger(1957) published a book, *Theory of Cognitive Dissonance*, and explained the cognitive dissonance theory, which assumes that all human beings pursue consistency in their mind.

- Basic Hypotheses
  - It is a state of mental unease and discomfort which helps explain selective perception. It is produced when new information contradicts existing beliefs, attitudes, social norms, or behaviors.
  - Many times people favor consonance because their ideas flow freely into one another and do not create an unbalance. [2]
  - The existence of dissonance, being psychologically uncomfortable, will motivate the person to try to reduce the dissonance and achieve consonance.
  - When dissonance is present, in addition to trying to reduce it, the person will actively avoid situations and information that would likely increase the dissonance. [3]

Festinger's cognitive dissonance theory, which was one of the roots of selective exposure, explained people's effort to reduce their dissonance of something against their existing beliefs. Nonetheless, his theory was broad enough to be elucidated in general social behavior, not just for selecting medium and media contents. Festinger suggested

situations that increase dissonance. Firstly, logical inconsistency brings about dissonance. If a person who believes it is not possible to build a device to leave Earth's atmosphere observes man reach the moon, their belief and experience are dissonant with each other. Secondly, cultural morals entail dissonance. A person picks up a chicken bone with their hands, and it is dissonant with what they believe is formal etiquette. At this point, culture defines what is consonant and what is dissonant. Thirdly, if specific opinion is included in a more general opinion, dissonance should be followed. A person, who has been Democrat, prefers Republican candidates for certain election. This situation creates dissonance, because “Being a Democrat” needs to be attributed to favoring Democratic candidates. Lastly, past experience causes dissonance. If a person is standing in the rain, but is not wet, these two cognitions would be dissonant, because they might know standing in the rain leads to getting wet through past experience. Festinger (1957) also suggests the ways of reducing dissonance. For reducing dissonance, one may change a behavioral cognitive element or change an environmental cognitive element. However, sometimes, behavior change and environmental change do not help reducing dissonance. Festinger, then, suggested adding new cognitive elements. If people cannot reduce dissonance, they might seek new information, which is consonant with their beliefs or attitude; therefore, people might actively seek new information that would decrease dissonance and avoid new information that would increase dissonance. This third explanation of reducing dissonance is similar with selective exposure, which mass communication reinforces the existing opinion.

- Another example of the Cognitive Dissonance Theory can be found in the article entitled, “Theories of Persuasion,” by Daniel J. O’Keefe. It describes the different theories of persuasion and how media outlets use them to their advantage to influence their audience. The author’s example is that people donate to the Red Cross because they believe in what it stands for which represents consonance. However, on the other hand, the author suggests that a person who smokes and also believes it causes cancer, would be an example of dissonance and hypocrisy. Many times people try to sway against dissonance because it puts them in an uncomfortable position. Therefore, these feelings of consonance and dissonance lead to the “Selective Exposure Theory” because some believe that people will select the media sources that agree with their opinions and attitudes on different subjects and then only follow those programs. [4]

Klapper's selective exposure

Joseph Klapper (1960) considered mass communication do not directly influence people, but just reinforce people’s predisposition. Mass communications play a role as a mediator in persuasive communication.

- Klapper's five mediating factors and conditions to affect people
  - Predispositions and the related processes of selective exposure, selective perception, and selective retention.
  - The groups, and the norms of groups, to which the audience members belong.
  - Interpersonal dissemination of the content of communication
  - The exercise of opinion leadership
  - The nature of mass media in a free enterprise society. [5]
- Three basic concepts
  - Selective exposure - people keep away from communication of opposite hue.
  - Selective Perception - If people are confronting unsympathetic material, they do not perceive it, or make it fit for their existing opinion.
  - Selective retention - Furthermore, they just simply forget the unsympathetic material.

Groups and group norms work as a mediator. For example, one can be strongly disinclined to change to the Democratic Party if their family has voted for Republican for a long time. In this case, the person’s predisposition to the political party is already set, so they don't perceive information about Democratic Party or change voting behavior because of mass communication. Klapper’s third assumption is inter-personal dissemination of mass communication. If someone is already exposed by close friends, which creates predisposition toward something, it will lead increase of exposure to mass communication and eventually reinforce the existing opinion. Opinion leader

is also a crucial factor to form predisposition of someone, lead someone to be exposed by mass communication, and after all, existing opinion would be reinforced. Nature of commercial mass media also leads people to select certain type of media contents. Klapper (1960) claimed that people are selecting entertainment, such as family comedy, variety shows, quizzes, and Westerns, because of nature of mass media in a free enterprise society.

Selective exposure in entertainment theory perspective

Selective exposure is an instinctive activity of human beings. Early human beings needed to be sensitive to the sounds of animals. This kind of exposure was closely related with their survival from an external threat. Survival is still a very crucial matter for human beings; however, selective exposure is also important for human beings for other purposes, such as entertainment.

"Selective exposure designates behavior that is deliberately performed to attain and sustain perceptual control of particular stimulus events."

Zillmann and Bryant, 1985[6]

Affective-dependent theory of stimulus arrangement

Zillmann and Bryant (1985) developed affective-dependent theory of stimulus arrangement in the chapter of their edited book, Selective exposure to communication.

- Basic Assumptions
  - people tend to minimize exposure to negative, aversive stimuli
  - people tend to maximize exposure to pleasurable stimuli.

After all, people try to arrange the external stimuli to maintain their pleasure, which ultimately let people select certain affect-inducing program, such as music, movie, or other entertainment program. In other words, people manage their mood by selecting certain kind of entertainment to exposure themselves; mood management theory was also rooted by this affective-dependent theory.

Furthermore, people will select media based on their moods. An example of this is if a person is happy they would probably select a comedic movie. If they are bored they might choose action and if they are sad they might select tragedy or a depressing romance. These attitudes and moods also convince people to watch different news outlets based on how they feel. People with conservative beliefs tend to watch Fox news and Democrats usually watch MSNBC.

- Examples:

1**A person with liberal beliefs, who comes home from a hard day at work will probably turn on MSNBC. They would not be in the mood to fight with a news station that has conservative beliefs constantly being portrayed. 2**A woman who just broke up with her boyfriend would probably not be in the mood to watch a romantic movie and would therefore tend to pick a movie that falls into the genre of tragedy.

Selective exposure processes in mood management

- Excitatory Homeostasis - Tendency of individuals to choose entertainment to achieve an optimal level of arousal.
- Intervention Potential - Ability of a message to engage or absorb an aroused individual's attention or cognitive-processing resources.
- Message-Behavioral Affinity - Communication that has a high degree of similarity with affective state.
- Hedonic Valence - Positive or negative nature of a message. [7]

Critiques

- Possible influence by factors other than a person's emotional state.
- Difficulty to measure long-term effect.
- Overlook the importance of cognitive processes.
- Not suit for information and education media.
- Possibility that negative stimuli provide enjoyment by overcoming it.

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Selective perception

Selective perception may refer to any number of cognitive biases in psychology related to the way expectations affect perception.

For instance, several studies have shown that students who were told they were consuming alcoholic beverages (which in fact were non-alcoholic) perceived themselves as being "drunk", exhibited fewer physiological symptoms of social stress, and drove a simulated car similarly to other subjects who had actually consumed alcohol. The result is somewhat similar to the placebo effect.

In one classic study on this subject related to the hostile media effect (which is itself an excellent example of selective perception), viewers watched a filmstrip of a particularly violent Princeton-Dartmouth American football game. Princeton viewers reported seeing nearly twice as many rule infractions committed by the Dartmouth team than did Dartmouth viewers. One Dartmouth alumnus did not see any infractions committed by the Dartmouth side and erroneously assumed he had been sent only part of the film, sending word requesting the rest.[1]

Selective perception is also an issue for advertisers, as consumers may engage with some ads and not others based on their pre-existing beliefs about the brand.

Seymour Smith, a prominent advertising researcher, found evidence for selective perception in advertising research in the early 1960s, and he defined it to be "a procedure by which people let in, or screen out, advertising material they have an opportunity to see or hear. They do so because of their attitudes, beliefs, usage preferences and habits, conditioning, etc."[2] People who like, buy, or are considering buying a brand are more likely to notice advertising than are those who are neutral toward the brand. This fact has repercussions within the field of advertising research because any post-advertising analysis that examines the differences in attitudes or buying behavior among those aware versus those unaware of advertising is flawed unless pre-existing differences are controlled for. Advertising research methods that utilize a longitudinal design are arguably better equipped to control for selective perception.

Selective perceptions are of two types:

- Low level – Perceptual vigilance
- High level – Perceptual defense

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Further reading

- Selective Perception in Stock Investing (http://www.investingator.org/selective-perception.html)

Selective retention

Selective retention, in relating to the mind, is the process when people more accurately remember messages that are closer to their interests, values and beliefs, than those that are in contrast with their values and beliefs, selecting what to keep in the memory, narrowing the informational flow.[1]

Such examples could include:

- A person may gradually reflect more positively on their time at school as they grow older
- A consumer might remember only the positive health benefits of a product they enjoy
- People tending to omit problems and disputes in past relationships
- A conspiracy theorist paying less attention to facts which do not aid their standpoint

Outside of the theory of memory and mind: Selective retention may also be retaining of contractual agreements upon moving on in open politics or of physical phenotypes in eugenic methods of propagation of traits and features of a genome. Among other fields where action can impose a strata of creative limitation.

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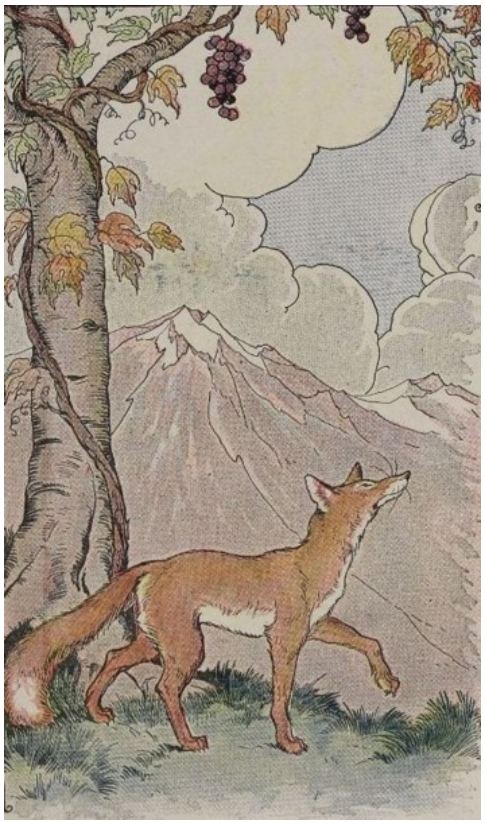
Cognitive dissonance

Cognitive dissonance is a discomfort caused by holding conflicting ideas simultaneously. The theory of cognitive dissonance proposes that people have a motivational drive to reduce dissonance. They do this by changing their attitudes, beliefs, and actions.[2] Dissonance is also reduced by justifying, blaming, and denying. The phrase was coined by Leon Festinger in his 1956 book When Prophecy Fails, which chronicled the followers of a UFO cult as reality clashed with their fervent beliefs.[3] [4] It is one of the most influential and extensively studied theories in social psychology. A closely related term, **cognitive disequilibrium**, was coined by Jean Piaget to refer to the experience of a discrepancy between something new and something already known or believed.

Experience can clash with expectations, as, for example, with buyer's remorse following the purchase of an expensive item. In a state of dissonance, people may feel surprise,[2] dread, guilt, anger, or embarrassment. People are biased to think of their choices as correct, despite any contrary evidence. This bias gives dissonance theory its predictive power, shedding light on otherwise puzzling irrational and destructive behavior.

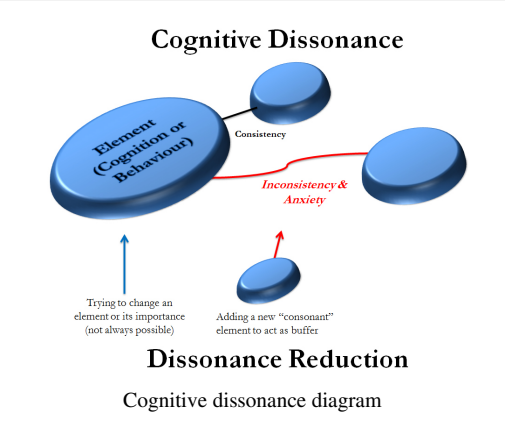
A classical example of this idea (and the origin of the expression "sour grapes") is expressed in the fable *The Fox and the Grapes* by Aesop (ca. 620–564 BCE). In the story, a fox sees some



The Fox and the Grapes by Aesop. When the fox fails to reach the grapes, he decides he does not want them after all, an example of adaptive preference formation, which serves to reduce cognitive dissonance.[1]

high-hanging grapes and wishes to eat them. When the fox is unable to think of a way to reach them, he surmises that the grapes are probably not worth eating, as they must not be ripe or that they are sour. This example follows a pattern: one desires something, finds it unattainable, and reduces one's dissonance by criticizing it. Jon Elster calls this pattern "adaptive preference formation."[1]

Examples



Cognitive dissonance diagram

The most famous case in the early study of cognitive dissonance was described by Leon Festinger and others in the book *When Prophecy Fails*.[5] The authors infiltrated a group that was expecting the imminent end of the world on a certain date. When that prediction failed, the movement did not disintegrate, but grew instead. By sharing cult beliefs with others, they gained acceptance and thus reduced their own dissonance (see further discussion below).

Smoking is often postulated as an example of cognitive dissonance because it is widely accepted that cigarettes can cause lung cancer, yet most people want to live a long and healthy life. In terms of the theory, the desire to live a long life is dissonant with the activity of doing something that will most likely shorten one's life. The tension produced by these contradictory ideas can be reduced by quitting smoking, denying the evidence linking smoking to lung cancer, or justifying one's smoking.[6] For example, smokers could rationalize their behavior by concluding that only a few smokers become ill, that it only happens to very heavy smokers, or that if smoking does not kill them, something else will.[7] While chemical addiction may operate in addition to cognitive dissonance for existing smokers, new smokers may exhibit a simpler case of the latter.

This case of dissonance could also be interpreted in terms of a threat to the self-concept.[8] The thought, "I am increasing my risk of lung cancer" is dissonant with the self-related belief, "I am a smart, reasonable person who makes good decisions." Because it is often easier to make excuses than it is to change behavior, dissonance theory leads to the conclusion that humans are sometimes rationalizing and not always rational beings.

Other related phenomena

There are a number of phenomena that relate to cognitive dissonance theory:

- *effort justification*, where working for something causes someone to like it more;
- *Self-evaluation maintenance theory*, in which the skills or interests that define us can cause dissonance when they appear superior in others close to us;
- *counter-attitudinal advocacy*, where behaviours supporting a dissonant attitude cause one to adopt that attitude;
- *post-decision dissonance*, where one justifies an unalterable decision as the right one;
- *insufficient punishment*, the practice of punishing a person without doing it so harshly that they can tell themselves "I still like the behaviour, but I avoid it because of the devastating punishment";
- *overjustification effect*, when an intrinsic (internal) motivation is shifted to extrinsic motivations through external reward;
- *balance theory*, a general tendency to seek consonance between our views of others, and our views of their attitudes;
- *self-handicapping*, avoiding effort in the hopes of keeping potential failure from hurting self-esteem;
- *Insufficient justification*, when an insufficient punishment is threatened for an avoided behavior, the behavior is deemed to be less desirable

Ben Franklin effect

One situation that may create dissonance is when someone does a favor for a person he dislikes. Here, the dissonance is between those negative feelings for the other person, and the awareness of having expended effort to help them. Cognitive dissonance theory predicts that people will try to resolve this dissonance by adopting a more positive attitude towards the other person. Several experiments have borne out this prediction.[9] [10] This has been named the *Ben Franklin effect* because it was anticipated by Franklin when he served in the Pennsylvania legislature in the 18th Century.[9] In his autobiography, he explains how he dealt with the animosity of a rival legislator:

> Having heard that he had in his library a certain very scarce and curious book, I wrote a note to him, expressing my desire of perusing that book, and requesting he would do me the favour of lending it to me for a few days. He sent it immediately, and I return'd it in about a week with another note, expressing strongly my sense of the favour. When we next met in the House, he spoke to me (which he had never done before), and with great civility; and he ever after manifested a readiness to serve me on all occasions, so that we became great friends, and our friendship continued to his death. This is another instance of the truth of an old maxim I had learned, which says, "He that has once done you a kindness will be more ready to do you another, than he whom you yourself have obliged."[11]

A counterpart to this effect is when someone's actions hurt another person, whom they regard positively or neutrally. In this case, one way to resolve the dissonance is to think more negatively about that person, so that they seem to deserve what happened to them.[9]

Variants

An overarching principle of cognitive dissonance is that it involves the formation of an idea or emotion in conflict with a fundamental element of the self-concept, such as "I am a successful/functional person", "I am a good person", or "I made the right decision." The anxiety that comes with the possibility of having made a bad decision can lead to rationalization, the tendency to create additional reasons or justifications to support one's choices. A person who just spent too much money on a new car might decide that the new vehicle is much less likely to break down than his or her old car. This belief may or may not be true, but it would reduce dissonance and make the person feel better. Dissonance can also lead to confirmation bias, the denial of dis-confirming evidence, and other ego defense mechanisms.

Within this overarching principle, there are two main forms of dissonance: hedonistic dissonance and moral dissonance (Holland, Meertens & Van-Vugt, 2002).

- *Hedonistic dissonance* is elicited when people act in a way which results in negative consequences for themselves. For instance, a person is late for a meeting because of traffic but could have been on time had he taken the subway.
- *Moral dissonance* is aroused when people act in a way that causes negative consequence for others. For instance, cheating and lying.

Theory and research

Most of the research on cognitive dissonance takes the form of one of four major paradigms. Important research generated by the theory has been concerned with the consequences of exposure to information inconsistent with a prior belief, what happens after individuals act in ways that are inconsistent with their prior attitudes, what happens after individuals make decisions, and the effects of effort expenditure.

The Belief Disconfirmation Paradigm

Dissonance is aroused when people are confronted with information that is inconsistent with their beliefs. If the dissonance is not reduced by changing one's belief, the dissonance can result in misperception or rejection or refutation of the information, seeking support from others who share the beliefs, and attempting to persuade others to restore consonance.

An early version of cognitive dissonance theory appeared in Leon Festinger's 1956 book, *When Prophecy Fails*. This book gave an inside account of the increasing belief which sometimes follows the failure of a cult's prophecy. The believers met at a pre-determined place and time, believing they alone would survive the Earth's destruction. The appointed time came and passed without incident. They faced acute cognitive dissonance: had they been the victim of a hoax? Had they donated their worldly possessions in vain? Most members chose to believe something less dissonant: the aliens had given earth a second chance, and the group was now empowered to spread the word: earth-spoiling must stop. The group dramatically increased their proselytism despite the failed prophecy.[12]

The Induced-Compliance Paradigm

In Festinger and Carlsmith's classic 1959 experiment, students were asked to spend an hour on boring and tedious tasks (e.g., turning pegs a quarter turn, over and over again). The tasks were designed to generate a strong, negative attitude. Once the subjects had done this, the experimenters asked some of them to do a simple favor. They were asked to talk to another subject (actually an actor) and persuade them that the tasks were interesting and engaging. Some participants were paid $20 (inflation adjusted to 2010, this equates to $150) for this favor, another group was paid $1 (or $7.50 in "2010 dollars"), and a control group was not asked to perform the favor.

When asked to rate the boring tasks at the conclusion of the study (not in the presence of the other "subject"), those in the $1 group rated them more positively than those in the $20 and control groups. This was explained by Festinger and Carlsmith as evidence for cognitive dissonance. The researchers theorized that people experienced dissonance between the conflicting cognitions, "I told someone that the task was interesting", and "I actually found it boring." When paid only $1, students were forced to internalize the attitude they were induced to express, because they had no other justification. Those in the $20 condition, however, had an obvious external justification for their behavior, and thus experienced less dissonance.[13]

In subsequent experiments, an alternative method of inducing dissonance has become common. In this research, experimenters use counter-attitudinal essay-writing, in which people are paid varying amounts of money (e.g. $1 or $10) for writing essays expressing opinions contrary to their own. People paid only a small amount of money have less external justification for their inconsistency and must produce internal justification in order to reduce the high degree of dissonance that they are experiencing.

A variant of the induced-compliance paradigm is the forbidden toy paradigm. An experiment by Aronson and Carlsmith in 1963 examined self-justification in children.[14] In this experiment, children were left in a room with a variety of toys, including a highly desirable toy steam-shovel (or other toy). Upon leaving the room, the experimenter told half the children that there would be a severe punishment if they played with that particular toy and told the other half that there would be a mild punishment. All of the children in the study refrained from playing with the toy. Later, when the children were told that they could freely play with whatever toy they wanted, the ones in the mild punishment condition were less likely to play with the toy, even though the threat had been removed. The

children who were only mildly threatened had to justify to themselves why they did not play with the toy. The degree of punishment by itself was not strong enough, so the children had to convince themselves that the toy was not worth playing with in order to resolve their dissonance.[14]

The Free-Choice Paradigm

In a different type of experiment conducted by Jack Brehm, 225 female students rated a series of common appliances and were then allowed to choose one of two appliances to take home as a gift. A second round of ratings showed that the participants increased their ratings of the item they chose, and lowered their ratings of the rejected item.[15] This can be explained in terms of cognitive dissonance. When making a difficult decision, there are always aspects of the rejected choice that one finds appealing and these features are dissonant with choosing something else. In other words, the cognition, "I chose X" is dissonant with the cognition, "There are some things I like about Y." More recent research has found similar results in four-year-old children and capuchin monkeys.[16]

The Effort-Justification Paradigm

Dissonance is aroused whenever individuals voluntarily engage in an unpleasant activity to achieve some desired goal. Dissonance can be reduced by exaggerating the desirability of the goal. Aronson & Mills[17] had individuals undergo a severe or mild "initiation" in order to become a member of a group. In the severe-initiation condition, the individuals engaged in an embarrassing activity. The group turned out to be very dull and boring. The individuals in the severe-initiation condition evaluated the group as more interesting than the individuals in the mild-initiation condition.

All of the above paradigms continue to be used in fruitful research.

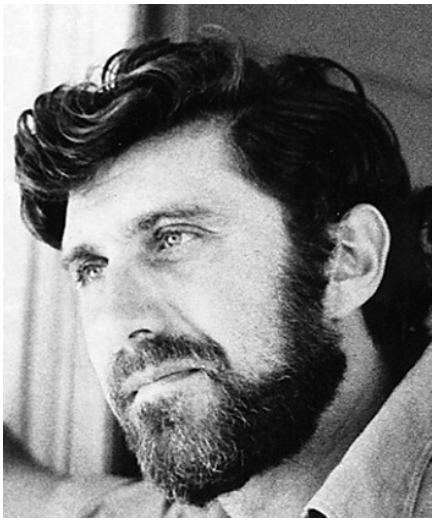
Washing one's hands has been shown to eliminate post-decisional dissonance, presumably because the dissonance is often caused by moral disgust (with oneself) which is related to disgust from unsanitary conditions.[18] [19]

Challenges and qualifications

Daryl Bem was an early critic of cognitive dissonance theory. He proposed self-perception theory as a more parsimonious alternative explanation of the experimental results. According to Bem, people do not think much about their attitudes, let alone whether they are in conflict. Bem interpreted people in the Festinger and Carlsmith study or the induced-compliance paradigm as inferring their attitudes from their behavior. Thus, when asked "Did you find the task interesting?" they decided that they must have found it interesting because that is what they told someone. Bem suggested that people paid $20 had a salient, external incentive for their behavior and were likely to perceive the money as their reason for saying the task was interesting, rather than concluding that they actually found it interesting.[20] [21]

In many experimental situations, Bem's theory and Festinger's dissonance theory make identical predictions, but only dissonance theory predicts the presence of unpleasant tension or arousal. Lab experiments have verified the presence of arousal in dissonance situations.[22] [23] This provides support for cognitive dissonance theory and makes it unlikely that self-perception by itself can account for all the laboratory findings.

In 1969, Elliot Aronson reformulated the theory by linking it to the self-concept. According to this new interpretation, cognitive dissonance does not arise because people experience dissonance between conflicting cognitions. Instead, it occurs when people see their actions as conflicting with their normally positive view of themselves. Thus, about the original Festinger and Carlsmith study using the induced-compliance paradigm, Aronson stated that the dissonance was between the cognition, "I am an honest person" and the cognition, "I lied to someone about finding the task interesting."[8] Other psychologists have argued that maintaining cognitive consistency is a way to protect public self-image, rather than private self-concept.[25] However, a recent result [26] seems to rule out such an explanation by showing revaluation of items following a choice even when people have forgotten their choices.



Elliot Aronson's 1968 restatement of the theory gave a central role to the self-concept.[24]

During the 1980s, Cooper and Fazio argued that dissonance was caused by aversive consequences, rather than inconsistency. According to this interpretation, the fact that lying is wrong and hurtful, not the inconsistency between cognitions, is what makes people feel bad.[27] Subsequent research, however, found that people experience dissonance even when they feel they have not done anything wrong. For example, Harmon-Jones and colleagues showed that people experience dissonance even when the consequences of their statements are beneficial—as when they convince sexually active students to use condoms, when they, themselves are not using condoms.[28]

Chen and colleagues have criticized the free-choice paradigm and have suggested that the "Rank, choice, rank" method of studying dissonance is invalid.[29] They argue that research design relies on the assumption that, if the subject rates options differently in the second survey, then the subject's attitudes towards the options have therefore changed. They show that there are other reasons one might get different rankings in the second survey—perhaps the subjects were largely indifferent between choices. Although some follow-up studies have found supportive evidence for Chen's concerns,[30] other studies that have controlled for Chen's concerns have not, instead suggesting that the mere act of making a choice can indeed change preferences.[16] [31] [32] Nevertheless, this issue remains under active investigation.[33]

Cognitive dissonance in the brain

Using fMRI, Van Veen and colleagues investigated the neural basis of cognitive dissonance in a modified version of the classic induced compliance paradigm. While in the scanner, participants "argued" that the uncomfortable MRI environment was nevertheless a pleasant experience. The researchers replicated the basic induced compliance findings; participants in an experimental group enjoyed the scanner more than participants in a control group who simply were paid to make their argument. Importantly, responding counter-attitudinally activated the dorsal anterior cingulate cortex and the anterior insular cortex; furthermore, the degree to which these regions were activated predicted individual participants' degree of attitude change. Van Veen and colleagues argue that these findings support the original dissonance theory by Festinger, and support the "conflict theory" of anterior cingulate functioning.[34]

Using the free choice paradigm, Sharot and colleagues have shown that after making a choice, activity in the striatum changes to reflect the new evaluation of the choice object, increasing if the object was chosen and decreasing if it was rejected.[35] Follow-up studies have largely confirmed these results.[31] [36]

Modeling in neural networks

Neural network models of cognition have provided the necessary framework to integrate the empirical research done on cognitive dissonance and attitudes into one model of explanation of attitude formation and change.[37]

Various neural network models have been developed to predict how cognitive dissonance will influence an individual's attitude and behavior. These include:

- Parallel Constraint Satisfaction Processes[37]
- The Meta-Cognitive Model (MCM) of attitudes[38]
- Adaptive connectionist model of cognitive dissonance[39]
- Attitudes as constraint satisfaction model[40]

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External links

- Cognitive dissonance entry in *The Skeptic's Dictionary* (http://www.skepdic.com/cognitivedissonance.html)
- Festinger and Carlsmith's original paper (http://psychclassics.yorku.ca/Festinger/index.htm)

Leon Festinger

Leon Festinger	
	
Fields	Psychology
Known for	cognitive dissonance

Leon Festinger (pronounced Feh-sting-er) (New York City, May 8, 1919 – New York City, February 11, 1989), was an American social psychologist, responsible for the development of the Theory of Cognitive Dissonance, Social comparison theory, and the discovery of the role of propinquity in the formation of social ties as well as other contributions to the study of social networks.

Festinger is perhaps best known for the Theory of Cognitive Dissonance, which suggests that inconsistency among beliefs and behaviors will cause an uncomfortable psychological tension. This will lead people to change their beliefs to fit their actual behavior, rather than the other way around, as popular wisdom may suggest.[1]

Festinger was also responsible for Social Comparison Theory, which examines how people evaluate their own opinions and desires by comparing themselves with others, and how groups exert pressures on individuals to conform with group norms and goals.[2] [3]

Festinger also made important contributions to social network theory. Studying the formation of social ties, such as the choice of friends among college freshmen housed in dorms, Festinger (together with Stanley Schachter and Kurt Back) showed how the formation of ties was predicted by propinquity, the physical proximity between people, and not just by similar tastes or beliefs, as laymen tend to believe. That is, people simply tend to befriend their neighbors.[4]

Earlier in his career, Festinger explored the various forms that social groups can take [5] [6] and showed, together with Schachter and Back,[7] "how norms are clearer, more firmly held and easier to enforce the more dense a social network is." [8]

Career

Festinger earned a Bachelor of Science degree from the City College of New York in 1939, and proceeded to receive a Master from University of Iowa in 1942, where he studied with Kurt Lewin, another pioneer in social psychology. Over the course of his career, Festinger was a faculty member in the University of Iowa, the University of Rochester, Massachusetts Institute of Technology (MIT), the University of Minnesota, the University of Michigan, Stanford University, and the New School for Social Research.

Born to self-educated Russian-Jewish immigrants Alex Festinger (an embroidery manufacturer) and Sara Solomon Festinger in Brooklyn, New York, Leon Festinger attended Boys' High School and received a bachelor's in science at City College of New York in 1939. He received a Master's in psychology from the University of Iowa in 1942 after studying under prominent social psychologist Kurt Lewin, who was working to create a "field theory" of psychology (by analogy to physics) to respond to the mechanistic models of the behaviorists.[9]

The same year, he married pianist Mary Oliver Ballou with whom he had three children (Catherine, Richard and Kurt Stanley Schachter, "Festinger followed, becoming an assistant professor. Lewin died in 1947 and Festinger left to become an Associate Professor at the [[University of Michigan [10]], where he was program director for the Group Dynamics Center.

In 1951, he became a Professor of Psychology at the University of Minnesota. His 1953 book *Research Methods in the Behavioral Sciences* (with Daniel Katz) stressed the need for well-controlled variables in laboratory experiments, even if this meant deceiving the participants.

In 1955, Festinger moved to Stanford University. Finally, in 1968 he became a Professor of Psychology at the New School for Social Research in New York (chair endowed by Hermann Staudinger). He remarried the following year to Trudy Bradley, a Professor at the New York University School of Social Work. They had no children.[9]

Example of cognitive dissonance

Festinger's theory of cognitive dissonance can account for the psychological consequences of disconfirmed expectations. One of the first published cases of dissonance was reported in the book, *When Prophecy Fails* (Festinger et al. 1956). Festinger and his associates read an interesting item in their local newspaper headlined "Prophecy from planet clarion call to city: flee that flood."

Festinger and his colleagues saw this as a case that would lead to the arousal of dissonance when the prophecy failed. They infiltrated the group and reported the results, confirming their expectations.

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External links

- Brief biographical page (http://www.dushkin.com/connectext/psy/ch15/bio15.mhtml)

Social comparison theory

Social comparison theory is a theory initially proposed by social psychologist Leon Festinger in 1954. It explains how individuals evaluate their own opinions and desires by comparing themselves to others.

Basic framework

The social comparison theory (Festinger, 1954) is the idea that there is a drive within individuals to look to outside images in order to evaluate their own opinions and abilities. These images may be a reference to physical reality or in comparison to other people. People look to the images portrayed by others to be obtainable and realistic, and subsequently, make comparisons among themselves, others and the idealized images.

In his initial theory, Festinger hypothesized several things. First, he stated that humans have a drive to evaluate themselves by examining their opinions and abilities in comparison to others. To this, he added that the tendency to compare oneself with some other specific person decreases as the difference between that person's opinion or ability and one's own become more divergent. He also hypothesized that there is an upward drive towards achieving greater abilities, but that there are non-social restraints which make it nearly impossible to change them, and that this is largely absent in opinions (Festinger, 1954).

He continued with the idea that to cease comparison between one's self and others causes hostility and deprecation of opinions. His hypotheses also stated that a shift in the importance of a comparison group will increase pressure towards uniformity with that group. However, if the person, image or comparison group is too divergent from the evaluator, the tendency to narrow the range of comparability becomes stronger (Festinger, 1954). To this he added that people who are similar to an individual are especially good in generating accurate evaluations of abilities and opinions (Suls, Martin, & Wheeler, 2002). Lastly, he hypothesized that the distance from the mode of the comparison group will affect the tendencies of those comparing; that those who are closer will have stronger tendencies to change than those who are further away (Festinger, 1954).

Further development

Since its introduction to communication and social psychology, research has shown that social comparisons are more complex than initially thought, and that people play a more active role in comparisons (Suls, Martin & Wheeler 2002). A number of revisions, including new domains for comparison and motives, have also been made since 1954. Motives that are relevant to comparison include self-enhancement, perceptions of relative standing, maintenance of a positive self-evaluation, closure, components of attributes and the avoidance of closure (Kruglanski & Mayseless, 1990; Suls, Martin, & Wheeler, 2002).

Several models have been introduced to social comparison, including the Proxy Model and the Triadic Model. The Proxy model anticipates the success of something that is unfamiliar. The model proposes that if a person is successful or familiar with a task, then he or she would also be successful at a new similar task. The Triadic Model proposes that people with similar attributes and opinions will be relevant to each other and therefore influential to each other (Suls, Martin, & Wheeler, 2002).

Two main types of comparisons exist in social comparison: upward and downward. Upward social comparison occurs when individuals compare themselves to others who are deemed socially above them in some way. People intentionally compare themselves with others so that they can make their self-views more positive. In this type of comparison, people want to believe themselves to be part of the elite, and make comparisons showing the similarities

in themselves and the comparison group. (Suls, Martin & Wheeler 2002).

Downward social comparison acts in the opposite direction. Downward social comparison is a defensive tendency to evaluate oneself with a comparison group whose troubles are more serious than one's own. This tends to occur when threatened people look to others who are less fortunate than themselves. Downward comparison theory emphasizes the positive effects of comparisons, which people tend to make when they feel happy rather than unhappy. For example, a breast cancer patient may have had a lumpectomy, but sees herself as better off than another patient who lost her breast (Hakmiller 1966, Suls, Martin & Wheeler 2002).

While there have been changes in Festinger's original concept, many fundamental aspects remain, including the similarity in the comparison groups, the tendency towards social comparison and the general process that is social comparison (Kruglanski, & Mayseless).

Developmental history

In the 1950s, Festinger was given a grant from the Behavioral Sciences Division of the Ford Foundation. This grant was part of the research program of the Laboratory for Research in Social Relations, which developed the Social Comparison Theory (Festinger, 1954). The development of social comparison hinged on several socio-psychological processes, and in order to create this theory, Festinger used research from colleagues that focused on social communication, group dynamics, the autokinetic effect, compliant behavior, social groups and level of aspiration (Festinger, 1954; Kruglanski & Mayseless, 1990). In his article, he sourced various experiments with children and adults, however, much of his theory was based on his own research (Festinger, 1954).

When understanding the basis of social comparison, it is imperative to understand that no one thought process created the theory, but rather, a compilation of experiments, historical evidence and philosophical thought. While Festinger was the first social psychologist to coin the term “Social Comparison”, the general concept cannot be claimed exclusively by him (Suls & Wheeler, 2000). In fact, this theory’s origins can be dated back to Aristotle and Plato. Plato spoke of comparisons of self-understanding and absolute standards. Aristotle was concerned with comparisons between people. Later, philosophers such as Kant, Marx and Rousseau spoke on moral reasoning and social inequality. (Suls, Martin, & Wheeler, 2002).

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Mood management theory

Mood management theory posits that the consumption of messages, particularly entertaining messages, is capable of altering prevailing mood states, and that the selection of specific messages for consumption often serves the regulation of mood states (Zillmann, 1988a).

History

The idea of selecting media content in the interest of enhancing one's states has been proposed by Zillmann and Bryant (1985) and Zillmann (1988a). Initially, the assumptions were referred to as theory of affect-dependent stimulus arrangement, but subsequently gained more prominence under the label of mood management (Knobloch, 2006).

Mood management research can be traced back to Leon Festinger's (1957) cognitive dissonance theory. Festinger notes that human organism tries to establish internal congruity among cognitions such as attitudes, beliefs, and knowledge about oneself and the environment. When a person holds two cognitions that are incompatible, dissonance is produced. But such dissonance can be reduced through selective exposure, that is, individuals will seek out information that will reduce the dissonance and avoid information that will increase the already existing dissonance.

Festinger's theory was primarily laid out in cognitive terms, addressing exposure choices to persuasive messages. Zillmann and his colleagues thus proposed the mood management theory that attempts to cope with the broadest possible range of message choices such as news, documents, comedies, dramas, tragedies, music performances, and sports. It deals with all conceivable moods rather than a single, specific affective state, such as dissonance (Zillman, 1988b).

Fundamental assumptions

Based on the hedonistic premise that individuals are motivated for pleasure and against pain, mood management theory states that, to the extent possible, individuals tend to arrange their environment so that good mood (commonly pleasure) is maximized or maintained, and bad mood (commonly pain) is diminished or alleviated. Environmental arrangement can take many forms, including psychically moving away from or avoiding situations that creates negative effect (such as avoiding a stressful traffic jam), or moving toward or selecting situations that result in gratification (such as strolling in a beautiful garden). Moreover, since entertainment provides its audience with the opportunity to symbolically arrange the environment, mood management theory states that people's entertainment choices should similarly serve the management of moods (Oliver, 2003).

The specific hypotheses of mood management theory have been summarized as follows by Zillmann (2000):

> The indicated hedonistic objective is best served by selective exposure to material that (a) is excitationally opposite to prevailing states associated with noxiously experienced hypo- or hyperarousal, (b) has positive hedonic value above that of prevailing states, and (c) in hedonically negative states, has little or no semantic affinity with the prevailing states.

Although mood management suggests that individuals' behaviors often conform to the hedonistic assumption, this theory also makes clear that individuals are not necessarily aware of their motivation. Rather, people are thought to initially arrange their environments in a random fashion, and arrangements that are incidentally made during good moods and that extend or enhance the hedonically positive state leave a memory trace that increases the likelihood

for making similar stimulus arrangements under similar circumstances (Zillmann, 1988a, 1988b). In other words, the formation of these preferences is controlled by a mechanism called operant conditioning, which refers to the use of consequences to modify the occurrence and form of behavior.

Empirical evidence

Although its principles relate to the broader realm of mood optimization, mood management theory has largely been applied to entertainment choices. Focusing on viewers' selection of television entertainment, for example, an experimental study by Bryant and Zillmann (1984) reveals that individuals can overcome boredom or stress through selective exposure to exciting or relaxing television programming respectively. In the context of music exposure, Knobloch and Zillmann (2002) demonstrate that individuals could improve negative moods by electing to listen to highly energetic-joyful music. Also, Wakshlag et al. (1983) reported that participants with increased fear levels preferred films with low victimization scores and with high justice scores. This demonstrates that individuals aim to minimize stimuli which are associated with the source of a negative mood.

Challenges

The theoretical proposition of mood management theory has been faced with challenges, especially when studying (1) the role that negative moods and burdening feelings play within the entertainment experience; (2) the diversity of individual users, social and cultural situations, and media products on offer, and (3) the new, so-called interactive media and how entertainment can best be conceptualized within them (Vorderer, 2003).

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External links

- Dolf Zillmann's webpage [1]

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Valence (psychology)

Valence, as used in psychology, especially in discussing emotions, means the intrinsic attractiveness (positive valence) or aversiveness (negative valence) of an event, object, or situation.[1] However, the term is also used to characterize and categorize specific emotions. For example, the emotions popularly referred to as "negative", such as anger and fear, have "negative valence". Joy has "positive valence". Positively valenced emotions are evoked by positively valenced events, objects, or situations. The term is also used about the hedonic tone of feelings, affect, certain behaviors (for example, approach and avoidance), goal-attainment or -non-attainment, and conformity with or violation of norms. Ambivalence can be viewed as conflict between positive and negative valence-carriers.

History of usage

The term entered English usage in psychology with the translation from German in 1935 of works of Kurt Lewin. Ambivalence has a longer history.

Criterion for emotion

Valence is one criterion used in some definitions of emotion. The possible absence of valence is cited as a reason to exclude surprise, viewed as the startle reaction, from the list of emotions, though some would include it.

Measurement

Valence could be assigned a number and treated as if it were measured, but the validity of a measurement based on a subjective report is questionable. Measurement based on observations of facial expressions, using the Facial Action Coding System and microexpressions (see Paul Ekman), or on modern functional brain imaging may overcome this objection.

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Empathy

Empathy is the capacity to recognize and, to some extent, share feelings (such as sadness or happiness) that are being experienced by another sapient or semi-sapient being. Someone may need to have a certain amount of empathy before they are able to feel compassion. The English word was coined in 1909 by E.B. Titchener as an attempt to translate the German word "Einfühlungsvermögen", a new phenomenon explored at the end of 19th century mainly by Theodor Lipps. It was later re-translated (Germanized) into the German language into "Empathie" and still in use there.[1]

Compassion, by Nicholas Roerich, 1936

Etymology

The English word is derived from the Greek word *ἐμπάθεια* (*empatheia*), "physical affection, passion, partiality" which comes from *ἐν* (*en*), "in, at" + *πάθος* (*pathos*), "passion" or "suffering".[2] The term was adapted by Hermann Lotze and Robert Vischer to create the German word *Einfühlung* ("feeling into"), which was translated by Edward B. Titchener into the English term empathy.[3]

Alexithymia from the Ancient Greek words *λέξις* (*lexis*) and *θύμος* (*thumos*) modified by an alpha-privative—literally "without words for emotions"—is a term to describe a state of deficiency in understanding, processing, or describing emotions in oneself.[4] [5]

Theorists and definition

Empathy is an ability with many different definitions. They cover a broad spectrum, ranging from caring for other people and having a desire to help them, to experiencing emotions that match another person's emotions, to knowing what the other person is thinking or feeling, to blurring the line between self and other.[6] Below are definitions of empathy:

- Daniel Batson: "A motivation oriented towards the other."[7]
- D. M. Berger: "The capacity to know emotionally what another is experiencing from within the frame of reference of that other person, the capacity to sample the feelings of another or to put one's self in another's shoes."[8]
- Jean Decety: "A sense of similarity in feelings experienced by the self and the other, without confusion between the two individuals."[9] [10]
- Frans de Waal: "The capacity to (a) be affected by and share the emotional state of another, (b) assess the reasons for the other's state, and (c) identify with the other, adopting his or her perspective. This definition extends beyond what exists in many animals, but the term "empathy" … applies even if only criterion (a) is met."[11]
- Nancy Eisenberg: "An affective response that stems from the apprehension or comprehension of another's emotional state or condition, and that is similar to what the other person is feeling or would be expected to feel."[12]
- R. R. Greenson: To empathize means to share, to experience the feelings of another person.
- Alvin Goldman: "The ability to put oneself into the mental shoes of another person to understand her emotions and feelings."[13]

- Martin Hoffman: any process where the attended perception of the object's state generates a state in the subject that is more applicable to the object's state or situation than to the subject's own prior state or situation.
- William Ickes: A complex form of psychological inference in which observation, memory, knowledge, and reasoning are combined to yield insights into the thoughts and feelings of others.
- Heinz Kohut: Empathy is the capacity to think and feel oneself into the inner life of another person[14]
- Harry Prosen: "an emotional understanding which allows one as a therapist to resonate with ones patients in depth emotionally, so that it influences the therapeutic approach and alliance with the patient"[15]
- Carl Rogers: To perceive the internal frame of reference of another with accuracy and with the emotional components and meanings which pertain thereto as if one were the person, but without ever losing the "as if" condition. Thus, it means to sense the hurt or the pleasure of another as he senses it and to perceive the causes thereof as he perceives them, but without ever losing the recognition that it is as if I were hurt or pleased and so forth.[16]
- Roy Schafer: Empathy involves the inner experience of sharing in and comprehending the momentary psychological state of another person.[17]
- Wynn Schwartz: We recognize others as empathic when we feel that they have accurately acted on or somehow acknowledged in stated or unstated fashion our values or motivations, our knowledge, and our skills or competence, but especially as they appear to recognize the significance of our actions in a manner that we can tolerate their being recognized.[18]
- Edith Stein: Empathy is the experience of foreign consciousness in general.[19]
- Simon Baron-Cohen (2003): Empathy is about spontaneously and naturally tuning into the other person's thoughts and feelings, whatever these might be [...]There are two major elements to empathy. The first is the cognitive component: Understanding the others feelings and the ability to take their perspective [...] the second element to empathy is the affective component. This is an observer's appropriate emotional response to another person's emotional state.[20]
- Khen Lampert (2005): "[Empathy] is what happens to us when we leave our own bodies...and find ourselves either momentarily or for a longer period of time in the mind of the other. We observe reality through her eyes, feel her emotions, share in her pain."[21]

Since empathy involves understanding the emotional states of other people, the way it is characterized is derivative of the way emotions themselves are characterized. If, for example, emotions are taken to be centrally characterized by bodily feelings, then grasping the bodily feelings of another will be central to empathy. On the other hand, if emotions are more centrally characterized by a combination of beliefs and desires, then grasping these beliefs and desires will be more essential to empathy. The ability to imagine oneself as another person is a sophisticated imaginative process. However, the basic capacity to recognize emotions is probably innate and may be achieved unconsciously. Yet it can be trained and achieved with various degrees of intensity or accuracy.

The human capacity to recognize the bodily feelings of another is related to one's imitative capacities and seems to be grounded in the innate capacity to associate the bodily movements and facial expressions one sees in another with the proprioceptive feelings of producing those corresponding movements or expressions oneself.[22] Humans seem to make the same immediate connection between the tone of voice and other vocal expressions and inner feeling.

Contrast with other phenomena

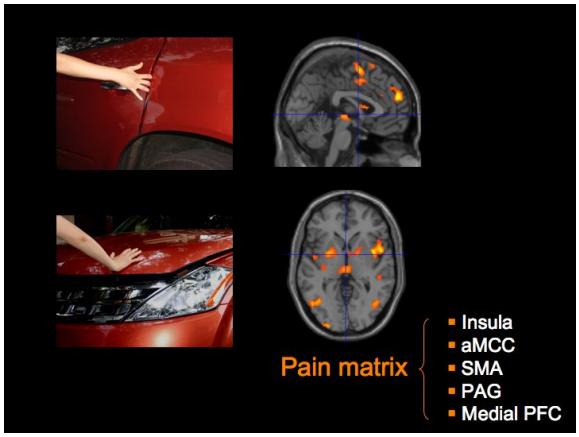
Empathy is distinct from sympathy (which includes empathizing with in addition to having a positive regard or non-fleeting concern for the object thereof), pity, and emotional contagion.[23] Sympathy or empathic concern is the feeling of compassion or concern for another, the wish to see them better off or happier. Pity is feeling that another is in trouble and in need of help as they cannot fix their problems themselves, often described as "feeling sorry" for someone. Emotional contagion is when a person (especially an infant or a member of a mob) imitatively "catches" the emotions that others are showing without necessarily recognizing this is happening.[24]

Perspective-taking

Just as empathy was conceptually distinguished from sympathy, beginning with the early definitions of empathy in the 19th century, the term may be in the process of being distinguished further, this time from "perspective taking". Due both to the conceptual confusions between the emotional and cognitive aspects of empathy and to an emerging sense of the differences in the functional aspects of the two phenomena, more-recent discussions have distinguished between empathy (as the more intuitive emotional aspect) and perspective-taking (as the more cognitive aspect).[25] Some authors, however, see perspective taking as one of the dimensions of empathy.[26]

Development

By the age of two, children normally begin to display the fundamental behaviors of empathy by having an emotional response that corresponds with another person.[27] Even earlier, at one year of age, infants have some rudiments of empathy, in the sense that they understand that, just like their own actions, other people's actions have goals.[28] [29] [30] Sometimes, toddlers will comfort others or show concern for them at as early an age as two. Also during the second year, toddlers will play games of falsehood or "pretend" in an effort to fool others, and this requires that the child know what others believe before he or she can manipulate those beliefs.[31]



When children are shown videoclips with situations where they see people suffering pain by coincidence, neural circuits related to pain are being activated in their brain.

According to researchers at the University of Chicago who used functional magnetic resonance imaging (fMRI), children between the ages of 7 and 12 appear to be naturally inclined to feel empathy for others in pain. Their findings[32] are consistent with previous fMRI studies of pain empathy with adults. The research also found additional aspects of the brain were activated when youngsters saw another person intentionally hurt by another individual, including regions involved in moral reasoning.[33]

Despite being able to show some signs of empathy, such as attempting to comfort a crying baby, from as early as 18 months to two years, most children do not show a fully fledged theory of mind until around the age of four.[34] Theory of mind involves the ability to understand that other people may have beliefs that are different from one's own, and is thought to involve the cognitive component of empathy.[20] Children usually become capable of passing "false belief" tasks, considered to be a test for a theory of mind, around the age of four. Individuals with autism often find using a theory of mind very difficult (e.g. Baron-Cohen, Leslie & Frith, 1988; the Sally-Anne test).

Empathetic maturity is a cognitive structural theory developed at the Yale University School of Nursing and addresses how adults conceive or understand the personhood of patients. The theory, first applied to nurses and since applied to other professions, postulates three levels that have the properties of cognitive structures. The third and highest level is held to be a meta-ethical theory of the moral structure of care. Those adults operating with level-III understanding synthesize systems of justice and care-based ethics.[35]

Neurological basis

Research in recent years has focused on possible brain processes underlying the experience of empathy. For instance, functional magnetic resonance imaging (fMRI) has been employed to investigate the functional anatomy of empathy.[36] [37] These studies have shown that observing another person's emotional state activates parts of the neuronal network involved in processing that same state in oneself, whether it is disgust,[38] touch,[39] [40] or pain.[41] [42] [43] [44] The study of the neural underpinnings of empathy has received increased interest following the target paper published by Preston and Frans de Waal,[45] following the discovery of mirror neurons in monkeys that fire both when the creature watches another perform an action as well as when they themselves perform it. In their paper, they argued that attended perception of the object's state automatically activates neural representations, and that this activation automatically primes or generates the associated autonomic and somatic responses, unless inhibited. This mechanism is similar to the common coding theory between perception and action.

Lack

Indifference to others' suffering

Psychopathy

Some psychopaths are able to detect the emotions of others with such a theory of mind and can mimic caring and friendship in a convincing manner, often in an effort to callously exploit others. While some psychopaths can detect what others are feeling, they do not experience any reciprocal emotion or sympathy. However, some research indicates that components of neural circuits involved in empathy may also be dysfunctional in psychopathy.[46]

Narcissistic personality disorder

One characteristic of someone with narcissistic personality disorder is "lacks empathy: is unwilling to recognize or identify with the feelings and needs of others" in order to maintain a secure emotional distance and protect himself from vulnerability.[47]

Enjoyment of others' suffering

Sadistic personality disorder

The same ability may underlie schadenfreude and sadism. Recently, an fMRI study conducted by Jean Decety and colleagues at the University of Chicago has demonstrated that youths with aggressive conduct disorder (who have psychopathic tendencies) have a different brain response when confronted with empathy-eliciting stimuli.[48] In the study, researchers compared 16- to 18-year-old boys with aggressive conduct disorder to a control group of adolescent boys with no unusual signs of aggression. The boys with the conduct disorder had exhibited disruptive behavior such as starting a fight, using a weapon and stealing after confronting a victim. The youths were tested with fMRI while looking at video clips in which people endured pain accidentally, such as when a heavy bowl was dropped on their hands, and intentionally, such as when a person stepped on another's foot. Results show that the aggressive youths activated the neural circuits underpinning pain processing to the same extent and, in some cases, even more so than the control participants without conduct disorder. However, aggressive adolescents showed a specific and very strong activation of the amygdala and ventral striatum (an area that responds to feeling rewarded) when watching pain inflicted on others, which suggested that they enjoyed watching pain. Unlike the control group, the youths with conduct disorder did not activate the area of the brain involved in self-regulation and moral reasoning.[48]

Anger and distress

Anger

Empathic anger is an emotion, a form of empathic distress.[49] Empathic anger is felt in a situation where someone else is being hurt by another person or thing. It is possible to see this form of anger as a pro-social emotion.

Empathic anger has direct effects on both helping and punishing desires. It can be divided to trait and state empathic angers.[50]

The relationship between empathy and anger response towards another person has also been investigated, with dispositional perspective taking found to be significantly negatively related to anger arousal. Empathic concern did not, however, significantly predict anger response, and higher personal distress was associated with increased anger.[51]

Distress

Empathic distress is feeling the perceived pain of another person, which feeling can be transformed into the empathic anger, feeling of injustice, and guilt. These emotions can be perceived as pro-social, and some say they can be seen as motives for moral behavior.[49]

Autism spectrum disorders

The interaction between empathy and autism spectrum disorders is a complex and ongoing field of research.

Contributing factors

Alexithymia

Research suggests that 85% of ASD individuals have alexithymia,[52] which involves not just the inability to verbally *express* emotions, but specifically the inability to *identify* emotional states in self or others.[53] According to recent fMRI studies[54] the syndrome of alexithymia, a condition in which an individual is rendered incapable of recognising and articulating emotional arousal in self or others, is responsible for a severe lack of emotional empathy.[54] The lack of empathic attunement inherent to alexithymic states may reduce quality[55] and satisfaction[56] of relationships.

Theory of mind

Also common is an impairment in theory of mind (ToM), the ability to model another's world view using either a theory-like analogy between oneself and others, or the ability to simulate pretend mental states and then apply the consequences of these simulations to others.[57] Francesca Happe showed that autistic children who demonstrate a lack of theory of mind (cognitive empathy) lack theory of mind for self as well as for others.[58]

Mirror neuron activity

One study found that, relative to typically developing children, high-functioning children with autism showed reduced mirror neuron activity in the brain's inferior frontal gyrus (pars opercularis) while imitating and observing emotional expressions.[59] The authors suggested that their study supports the hypothesis that a dysfunctional mirror neuron system may underlie the social deficits observed in autism. However, this finding has not been replicated by other fMRI studies.[60]

Cognitive versus affective empathy

Rogers et al. suggest that one must differentiate between cognitive empathy and affective empathy when regarding people with Asperger syndrome. They suggest that autistic individuals have less ability to ascertain others' feelings, but demonstrate equal empathy when they are aware of others' states of mind. Autistic and AS people actually have a greater response to stress that they witness others experiencing than neurotypical people do.[61]

Oversensitivity

A common source of confusion in analyzing the interactions between empathy and autism spectrum disorders (ASD) is that the apparent lack of empathy may mask emotional oversensitivity to the feelings of others. People with ASDs may suppress their emotional facility in order to avoid painful feedback. This is cited by Phoebe Caldwell, an author on ASD, who writes:

> What is clear is that, while people on the spectrum may not respond easily to external gestures/sounds, they do respond most readily if the initiative they witness is already part of their repertoire. This points to the selective use of incoming information rather than absence of recognition. It would appear that people with autism are actually rather good at recognition and imitation if the action they perceive is one that has meaning and significance for their brains.
>
> As regards the failure of empathic response, it would appear that at least some people with autism are oversensitive to the feelings of others rather than immune to them, but cannot handle the painful feed-back that this initiates in the body, and have therefore learnt to suppress this facility.

An apparent lack of empathy may also mask an inability to *express* empathy to others, as opposed to difficulty *feeling* it, internally.[62]

Practical issues

Proper empathic engagement helps one to understand and anticipate the behavior of another. Apart from the automatic tendency to recognise the emotions of others, one may also deliberately engage in empathic reasoning. Two general methods have been identified here (e.g. Goldie 2000). A person may simulate 'pretend' versions of the beliefs, desires, character traits and context of the other and see what emotional feelings this leads to. Or, a person may simulate the emotional feeling and then look around for a suitable reason for this to fit.

Some research suggests that people are more able and willing to empathize with those most similar to themselves. In particular, empathy increases with similarities in culture and living conditions. Empathy is more likely to occur between individuals whose interaction is more frequent. (See Levenson and Reuf 1997 and Hoffman 2000: 62). A measure of how well a person can infer the specific content of another person's thoughts and feelings has been developed by William Ickes (1997, 2003). Ickes and his colleagues have developed a video-based method to measure empathic accuracy and have used this method to study the empathic inaccuracy of maritally aggressive and abusive spouses, among other topics.

There are concerns that the empathiser's own emotional background may affect or distort what emotions they perceive in others (e.g. Goleman 1996: p. 104). Empathy is not a process that is likely to deliver certain judgements about the emotional states of others. It is a skill that is gradually developed throughout life, and which improves the more contact we have with the person with whom one empathises. Accordingly, any knowledge gained of the emotions of the other must be revisable in light of further information.

Ethical issues

The extent to which a person's emotions are publicly observable, or mutually recognized as such has significant social consequences. Empathic recognition may or may not be welcomed or socially desirable. This is particularly the case where we recognise the emotions that someone has towards us during real time interactions. Based on a metaphorical affinity with touch, philosopher Edith Wyschogrod claims that the proximity entailed by empathy increases the potential vulnerability of either party.[63] The appropriate role of empathy in our dealings with others is highly dependent on the circumstances. For instance, it is claimed that clinicians or caregivers must take care not to be too sensitive to the emotions of others, to over-invest their own emotions, at the risk of draining away their own resourcefulness. Furthermore an awareness of the limitations of empathic accuracy is prudent in a caregiving situation.

Disciplinary approaches

Psychotherapy

Heinz Kohut is the main introducer of the principle of empathy in psychoanalysis. His principle applies to the method of gathering unconscious material. The possibility of not applying the principle is granted in the cure, for instance when you must reckon with another principle, that of reality. Developing skills of empathy is often a central theme in the recovery process for drug addicts.

In evolutionary psychology, attempts at explaining pro-social behavior often mention the presence of empathy in the individual as a possible variable. Although exact motives behind complex social behaviors are difficult to distinguish, the "ability to put oneself in the shoes of another person and experience events and emotions the way that person experienced them" is the definitive factor for truly altruistic behavior according to Batson's empathy-altruism hypothesis. If empathy is not felt, social exchange (what's in it for me?) supersedes pure altruism, but if empathy is felt, an individual will help by actions or by word, regardless of whether it is in their self-interest to do so and even if the costs outweigh potential rewards.[64]

Education

An important target of the method Learning by teaching (LbT) is to train systematically and, in each lesson, teach empathy. Students have to transmit new content to their classmates, so they have to reflect continuously on the mental processes of the other students in the classroom. This way it is possible to develop step-by-step the students' feeling for group reactions and networking.

Evolution of Empathy

In increasing number of studies in animal behavior and neuroscience claim that empathy is not restricted to humans, and is in fact as old as the mammals, or perhaps older. Examples include dolphins saving humans from drowning or from shark attacks, and a multitude of behaviors observed in primates, both in captivity and in the wild. (See, for instance, Frans de Waal's *The Age of Empathy*.) Rodents have been shown to demonstrate empathy for cagemates (but not strangers) in pain.[65] One of the most widely read studies on the evolution of empathy, which discusses a neural perception-action mechanism (PAM), is the one by Stephanie Preston and de Waal ([11]). This review postulates a bottom-up model of empathy that ties together all levels, from state matching to perspective-taking.

Fiction

Some philosophers (such as Martha Nussbaum) suggest that novel reading cultivates readers' empathy and leads them to exercise better world citizenship. For a critique of this application of the empathy-altruism hypothesis to experiences of narrative empathy, see Keen's *Empathy and the Novel* (Oxford, 2007). In some works of science fiction and fantasy, empathy is understood to be a paranormal or psychic ability to sense the emotions of others, as opposed to telepathy, which allows one to perceive thoughts as well. A person who has that ability is also called an "empath" or "telempath" in this context. Occasionally these empaths are also able to project their own emotions, or to affect the emotions of others.

History

Some postmodern historians such as Keith Jenkins in recent years have debated whether or not it is possible to empathise with people from the past. Jenkins argues that empathy only enjoys such a privileged position in the present because it corresponds harmoniously with the dominant Liberal discourse of modern society and can be connected to John Stuart Mill's concept of reciprocal freedom. Jenkins argues the past is a foreign country and as we do not have access to the epistemological conditions of by gone ages we are unable to empathise.[66]

It is impossible to forecast the effect of empathy on the future. A past subject may take part in the present by the so-called historic present. If we watch from a fictitious past, can tell the present with the future tense, as it happens with the trick of the false prophecy. There is no way of telling the present with the means of the past.[67]

Business

In the 2009 book *Wired to Care*, strategy consultant Dev Patnaik argues that a major flaw in contemporary business practice is a lack of empathy inside large corporations. He states that lacking any sense of empathy, people inside companies struggle to make intuitive decisions and often get fooled into believing they understand their business if they have quantitative research to rely upon. Patnaik claims that the real opportunity for companies doing business in the 21st Century is to create a widely held sense of empathy for customers, pointing to Nike, Harley-Davidson, and IBM as examples of "Open Empathy Organizations". Such institutions, he claims, see new opportunities more quickly than competitors, adapt to change more easily, and create workplaces that offer employees a greater sense of mission in their jobs [68].

Philosophy

In the 2007 book *The Ethics of Care and Empathy*, philosopher Michael Slote introduces a theory of care-based ethics that is grounded in empathy. His claim is that moral motivation does, and should, stem from a basis of empathic response. He claims that our natural reaction to situations of moral significance are explained by empathy. He explains that the limits and obligations of empathy and in turn morality are natural. These natural obligations include a greater empathic, and moral obligation to family and friends, along with an account of temporal and physical distance. In situations of close temporal and physical distance, and with family or friends, our moral obligation seems stronger to us than with strangers at a distance naturally. Slote explains that this is due to empathy and our natural empathic ties. He further adds that actions are wrong if and only if they reflect or exhibit a deficiency of fully developed empathic concern for others on the part of the agent.[69]

In phenomenology, empathy is used to describe the experience in which one experiences what the *other* experiences as the experience of experiencing something from the other's viewpoint, without confusion between self and other. This draws on the sense of agency. In the most basic sense, this is the experience of the other's body and, in this sense, it is an experience of "my body over there". In most other respects, however, the experience is modified so that what is experienced is experienced as being the other's experience; in experiencing empathy, what is experienced is not "my" experience, even though *I* experience it. Empathy is also considered to be the condition of intersubjectivity and, as such, the source of the constitution of objectivity.

Measurement

Research into the measurement of empathy has sought to answer a number of questions: who should be carrying out the measurement? What should pass for empathy and what should be discounted? What unit of measure (UOM) should be adopted and to what degree should each occurrence precisely match that UOM are also key questions that researchers have sought to investigate.

Researchers have approached the measurement of empathy from a number of perspectives.

Behavioural measures normally involve raters assessing the presence or absence of certain either predetermined or ad-hoc behaviours in the subjects they are monitoring. Both verbal and non-verbal behaviours have been captured on video by experimenters such as Truax (1967b).[70] Other experimenters, including Mehrabian and Epstein (1972),[71] have required subjects to comment upon their own feelings and behaviours, or those of other people involved in the experiment, as indirect ways of signalling their level of empathic functioning to the raters.

Physiological responses tend to be captured by elaborate electronic equipment that has been physically connected to the subject's body. Researchers then draw inferences about that person's empathic reactions from the electronic readings produced (e.g. Levenson and Ruef, 1992;[72] Leslie et al., 2004[73]).

Bodily or "somatic" measures can be looked upon as behavioural measures at a micro level. Their focus is upon measuring empathy through facial and other non-verbally expressed reactions in the empathiser. These changes are presumably underpinned by physiological changes brought about by some form of "emotional contagion" or mirroring (e.g. Levenson and Ruef, 1992*; Leslie et al., 2004*). It should be pointed out that these reactions, whilst appearing to reflect the internal emotional state of the empathiser, could also, if the stimulus incident lasted more than the briefest period, be reflecting the results of emotional reactions that are based upon more pieces of thinking through (cognitions) associated with role-taking ("if I were him I would feel...").

Paper-based indices involve one or more of a variety of methods of responding. In some experiments, subjects are required to watch video scenarios (either staged or authentic) and to make written responses which are then assessed for their levels of empathy (e.g. Geher, Warner and Brown, 2001[74]); scenarios are sometimes also depicted in printed form (e.g. Mehrabian and Epstein, 1972[75]). Measures also frequently require subjects to self-report upon their own ability or capacity for empathy, using Likert-style numerical responses to a printed questionnaire that may have been designed to tap into the emotional, cognitive-affective or largely cognitive substrates of empathic functioning. Some questionnaires claim to have been able to tap into both cognitive and emotional substrates (e.g. Davis, 1980[76]). More recent paper-based tools include The Empathy Quotient (EQ) created by Baron-Cohen and Wheelwright[77] which comprises a self report questionnaire consisting of 60 items.

For the very young, picture or puppet-story indices for empathy have been adopted to enable even very young, pre-school subjects to respond without needing to read questions and write answers (e.g. Denham and Couchoud, 1990). Dependent variables (variables that are monitored for any change by the experimenter) for younger subjects have included self reporting on a 7-point smiley face scale and filmed facial reactions (Barnett, 1984).[78]

A certain amount of confusion exists about how to measure empathy. These may be rooted in another problem: deciding what is empathy and what is not. In general, researchers have until now been keen to pin down a singular definition of empathy which would allow them to design a measure to assess its presence in an exchange, in someone's repertoire of behaviours or within them as a latent trait. As a result they have been frequently forced to ignore the richness of the empathic process in favour of capturing surface, explicit self-report or third-party data about whether empathy between two people was present or not. In most cases, instruments have unfortunately only yielded information on whether someone had the potential to demonstrate empathy (Geher et al., 2001)*. Gladstein (1987)[79] summarises the position noting that empathy has been measured from the point of view of the empathiser, the recipient for empathy and the third-party observer. He suggests that since the multiple measures used have produced results that bear little relation to one another, researchers should refrain from making comparisons between scales that are in fact measuring different things. He suggests that researchers should instead stipulate what kind of

empathy they are setting out to measure rather than simplistically stating that they are setting out to measure the unitary phenomenon "empathy"; a view more recently endorsed by Duan and Hill (1996).[80]

In the field of medicine, a measurement tool for carers is the *Jefferson Scale of Physician Empathy, Health Professional Version (JSPE-HP)*.[81] At least one study using this tool with health sciences' students has found that levels of empathy are greater amogst females than males, and also are greater amongst older students than younger students.[82]

Gender differences

The issue of gender differences in empathy is quite controversial. It is often believed that females are more empathic than males. Evidence for gender differences in empathy are important for self report questionnaires of empathy in which it is obvious what was being indexed (e.g., impact of social desirability and gender stereotypes) but are smaller or nonexistent for other types of indexes that are less self-evident with regard to their purpose.[83] On average female subjects score higher than males on the Empathy Quotient (EQ), while males tend to score higher on the Systemizing Quotient (SQ).

Both males and females with Autistic Spectrum Disorders usually score higher on the SQ (Baron-Cohen, 2003).[20] However, a series of recent studies, using a variety of neurophysiological measures, including MEG,[84] spinal reflex excitability,[85] and electroencephalography[86] [87] have documented the presence of a gender difference in the human mirror neuron system, with female participants exhibiting stronger motor resonance than male participants. In addition, these aforementioned studies found that female participants scored higher on empathy self report dispositional measures and that these measures positively correlated with the physiological response. However, other studies show that women do not possess greater empathic abilities than men, and perceived gender differences are the result of motivational differences.[88] [89] Using fMRI, neuroscientist Tania Singer showed that empathy-related neural responses are significantly lower in males when observing an “unfair” person experiencing pain.[90]

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External links

- As Spirit - Celebrating the Oneness that is Us (http://AsSpirit.com) - A movement, community and global voice for bringing about a greater level of empathy in our world
- Center for Building a Culture of Empathy (http://cultureofempathy.com) A portal for empathy related resources; art, articles, definitions, conferences, experts, history, interviews, newsletter, science, videos, etc.
- Mirrored emotion (http://magazine.uchicago.edu/0604/features/emotion.shtml) by Jean Decety from the University of Chicago.
- *Dictionary of the History of Ideas*: (http://etext.lib.virginia.edu/cgi-local/DHI/dhi.cgi?id=dv2-09) Empathy.
- Empathic accuracy (http://www.guilford.com/cgi-bin/cartscript.cgi?page=pr/ickes.htm&dir=pp/dp&cart_id=) by William Ickes (Editor).
- Empathic listening skills (http://www.cnr.berkeley.edu/ucce50/ag-labor/7article/article40.htm) How to listen so others will feel heard, or listening first aid (University of California).
- Literature about empathy (http://www.empathy.se/Empathyeng/litteratureng.htm) Articles, books, and book chapters about empathy.
- To hear a definition of empathy given by Marshall Rosenberg (Nonviolent communication), through a parallel between empathy and surf (http://nvc-europe.org/SPIP/spip.php?article141).
- Greater Good magazine article examines human empathy (http://peacecenter.berkeley.edu/greatergood/archive/2005fallwinter/) Articles about empathy.
- Study: People Literally Feel Pain of Others - mirror-touch synesthesia (http://www.livescience.com/health/070617_touching_faces.html) Live Science, 17 June 2007.
- Articles on Empathy and Philosophy (http://EmpathyInTheContextOfPhilosophy.com) Empathy and Philosophy
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Confirmation bias

Confirmation bias (also called **confirmatory bias** or **myside bias**) is a tendency for people to favor information that confirms their preconceptions or hypotheses regardless of whether the information is true.[1] [2] As a result, people gather evidence and recall information from memory selectively, and interpret it in a biased way. The biases appear in particular for emotionally significant issues and for established beliefs. For example, in reading about gun control, people usually prefer sources that affirm their existing attitudes. They also tend to interpret ambiguous evidence as supporting their existing position. Biased search, interpretation and/or recall have been invoked to explain attitude polarization (when a disagreement becomes more extreme even though the different parties are exposed to the same evidence), belief perseverance (when beliefs persist after the evidence for them is shown to be false), the irrational primacy effect (a stronger weighting for data encountered early in an arbitrary series) and illusory correlation (in which people falsely perceive an association between two events or situations).

A series of experiments in the 1960s suggested that people are biased towards confirming their existing beliefs. Later work explained these results in terms of a tendency to test ideas in a one-sided way, focusing on one possibility and ignoring alternatives. In combination with other effects, this strategy can bias the conclusions that are reached. Explanations for the observed biases include wishful thinking and the limited human capacity to process information. Another proposal is that people show confirmation bias because they are pragmatically assessing the costs of being wrong, rather than investigating in a neutral, scientific way.

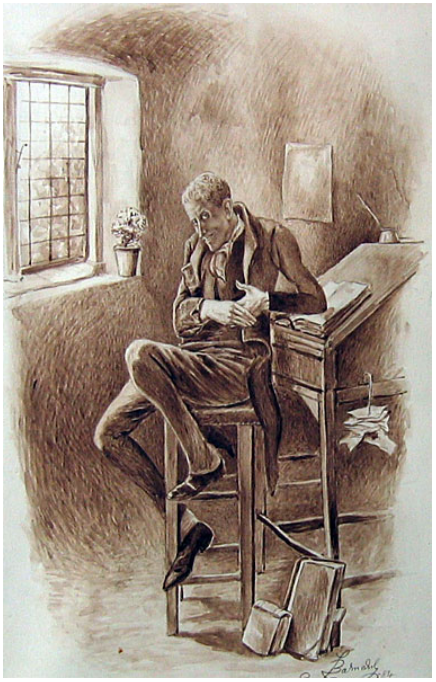
Confirmation biases contribute to overconfidence in personal beliefs and can maintain or strengthen beliefs in the face of contrary evidence. Hence they can lead to poor decisions, especially in organizational, scientific, military, political and social contexts.

Types

Confirmation biases are effects in information processing, distinct from the *behavioral confirmation effect*, also called "self-fulfilling prophecy", in which people behave so as to make their expectations come true.[3] Some psychologists use "confirmation bias" to refer to any way in which people avoid rejecting a belief, whether in searching for evidence, interpreting it, or recalling it from memory. Others restrict the term to selective collection of evidence.[4] [5]

Biased search for information

Experiments have repeatedly found that people tend to test hypotheses in a one-sided way, by searching for evidence consistent with the hypothesis they hold at a given time.[7] [8] Rather than searching through all the relevant evidence, they ask questions that are phrased so that an affirmative answer supports their hypothesis.[9] They look for the consequences that they would expect if their hypothesis were true, rather than what would happen if it were false.[9] For example, someone who is trying to identify a number using yes/no questions and suspects that the number is 3 might ask, "Is it an odd number?" People prefer this sort of question, called a "positive test", even when a negative test such as "Is it an even number?" would yield exactly the same information.[10] However, this does not mean that people seek tests that are guaranteed to give a positive answer. In studies where subjects could select either such pseudo-tests or genuinely diagnostic ones, they favored the genuinely diagnostic.[11] [12]



Confirmation bias has been described as an internal "yes man", echoing back a person's beliefs like Charles Dickens' character Uriah Heep.[6]

The preference for positive tests is not itself a bias, since poo tests can be highly informative.[13] However, in conjunction with other effects, this strategy can confirm existing beliefs or assumptions, independently of whether they are true.[14] In real-world situations, evidence is often complex and mixed. For example, various contradictory ideas about someone could each be supported by concentrating on one aspect of his or her behavior.[8] Thus any search for evidence in favor of a hypothesis is likely to succeed.[14] One illustration of this is the way the phrasing of a question can significantly change the answer.[8] For example, people who are asked, "Are you happy with your social life?" report greater satisfaction than those asked, "Are you *un*happy with your social life?"[15]

Even a small change in the wording of a question can affect how people search through available information, and hence the conclusions they reach. This was shown using a fictional child custody case.[16] Subjects read that Parent A was moderately suitable to be the guardian in multiple ways. Parent B had a mix of salient positive and negative qualities: a close relationship with the child but a job that would take him or her away for long periods. When asked, "Which parent should have custody of the child?" the subjects looked for positive attributes and a majority chose Parent B. However, when the question was, "Which parent should be denied custody of the child?" they looked for negative attributes, but again a majority answered Parent B, implying that Parent A should have custody.[16]

Similar studies have demonstrated how people engage in biased search for information, but also that this phenomenon may be limited by a preference for genuine diagnostic tests, where they are available. In an initial experiment, subjects had to rate another person on the introversion-extroversion personality dimension on the basis of an interview. They chose the interview questions from a given list. When the interviewee was introduced as an introvert, the subjects chose questions that presumed introversion, such as, "What do you find unpleasant about noisy

parties?" When the interviewee was described as extroverted, almost all the questions presumed extroversion, such as, "What would you do to liven up a dull party?" These loaded questions gave the interviewees little or no opportunity to falsify the hypothesis about them.[17] However, a later version of the experiment gave the subjects less presumptive questions to choose from, such as, "Do you shy away from social interactions?"[18] Subjects preferred to ask these more diagnostic questions, showing only a weak bias towards positive tests. This pattern, of a main preference for diagnostic tests and a weaker preference for positive tests, has been replicated in other studies.[18]

Another experiment gave subjects a particularly complex rule-discovery task involving moving objects simulated by a computer.[19] Objects on the computer screen followed specific laws, which the subjects had to figure out. They could "fire" objects across the screen to test their hypotheses. Despite making many attempts over a ten hour session, none of the subjects worked out the rules of the system. They typically sought to confirm rather than falsify their hypotheses, and were reluctant to consider alternatives. Even after seeing evidence that objectively refuted their working hypotheses, they frequently continued doing the same tests. Some of the subjects were instructed in proper hypothesis-testing, but these instructions had almost no effect.[19]

Biased interpretation

> "Smart people believe weird things because they are skilled at defending beliefs they arrived at for non-smart reasons."
>
> —Michael Shermer[20]

Confirmation biases are not limited to the collection of evidence. Even if two individuals have the same information, the way they interpret it can be biased.

A team at Stanford University ran an experiment with subjects who felt strongly about capital punishment, with half in favor and half against.[21] [22] Each of these subjects read descriptions of two studies; a comparison of U.S. states with and without the death penalty, and a comparison of murder rates in a state before and after the introduction of the death penalty. After reading a quick description of each study, the subjects were asked whether their opinions had changed. They then read a much more detailed account of each study's procedure and had to rate how well-conducted and convincing that research was.[21] In fact, the studies were fictional. Half the subjects were told that one kind of study supported the deterrent effect and the other undermined it, while for other subjects the conclusions were swapped.[21] [22]

The subjects, whether proponents or opponents, reported shifting their attitudes slightly in the direction of the first study they read. Once they read the more detailed descriptions of the two studies, they almost all returned to their original belief regardless of the evidence provided, pointing to details that supported their viewpoint and disregarding anything contrary. Subjects described studies supporting their pre-existing view as superior to those that contradicted it, in detailed and specific ways.[21] [23] Writing about a study that seemed to undermine the deterrence effect, a death penalty proponent wrote, "The research didn't cover a long enough period of time", while an opponent's comment on the same study said, "No strong evidence to contradict the researchers has been presented".[21] The results illustrated that people set higher standards of evidence for hypotheses that go against their current expectations. This effect, known as "disconfirmation bias", has been supported by other experiments.[24]

A study of biased interpretation took place during the 2004 US presidential election and involved subjects who described themselves as having strong feelings about the candidates. They were shown apparently contradictory pairs of statements, either from Republican candidate George W. Bush, Democratic candidate John Kerry or a politically neutral public figure. They were also given further statements that made the apparent contradiction seem reasonable. From these three pieces of information, they had to decide whether or not each individual's statements were inconsistent. There were strong differences in these evaluations, with subjects much more likely to interpret statements by the candidate they opposed as contradictory.[25]

An MRI scanner allowed researchers to examine how the human brain deals with unwelcome information.

In this experiment, the subjects made their judgments while in a magnetic resonance imaging (MRI) scanner which monitored their brain activity. As subjects evaluated contradictory statements by their favored candidate, emotional centers of their brains were aroused. This did not happen with the statements by the other figures. The experimenters inferred that the different responses to the statements were not due to passive reasoning errors. Instead, the subjects were actively reducing the cognitive dissonance induced by reading about their favored candidate's irrational or hypocritical behavior.[25]

Biased interpretation is not restricted to emotionally significant topics. In another experiment, subjects were told a story about a theft. They had to rate the evidential importance of statements arguing either for or against a particular character being responsible. When they hypothesized that character's guilt, they rated statements supporting that hypothesis as more important than conflicting statements.[26]

Biased memory

Even if someone has sought and interpreted evidence in a neutral manner, they may still remember it selectively to reinforce their expectations. This effect is called "selective recall", "confirmatory memory" or "access-biased memory".[27] Psychological theories differ in their predictions about selective recall. Schema theory predicts that information matching prior expectations will be more easily stored and recalled.[28] Some alternative approaches say that surprising information stands out more and so is more memorable.[28] Predictions from both these theories have been confirmed in different experimental contexts, with no theory winning outright.[29]

In one study, subjects read a profile of a woman which described a mix of introverted and extroverted behaviors.[30] They later had to recall examples of her introversion and extroversion. One group was told this was to assess the woman for a job as a librarian, while a second group were told it was for a job in real estate sales. There was a significant difference between what these two groups recalled, with the "librarian" group recalling more examples of introversion and the "sales" groups recalling more extraverted behavior.[30] A selective memory effect has also been shown in experiments that manipulate the desirability of personality types.[28] [31] In one of these, a group of subjects were shown evidence that extraverted people are more successful than introverts. Another group were told the opposite. In a subsequent, apparently unrelated, study, they were asked to recall events from their lives in which they had been either introverted or extraverted. Each group of subjects provided more memories connecting themselves with the more desirable personality type, and recalled those memories more quickly.[32]

One study showed how selective memory can maintain belief in extrasensory perception (ESP).[33] Believers and disbelievers were each shown descriptions of ESP experiments. Half of each group were told that the experimental results supported the existence of ESP, while the others were told they did not. In a subsequent test, subjects recalled the material accurately, apart from believers who had read the non-supportive evidence. This group remembered significantly less information and some of them incorrectly remembered the results as supporting ESP.[33]

Related effects

Polarization of opinion

When people with opposing views interpret new information in a biased way, their views can move even further apart. This is called "attitude polarization".[34] The effect was demonstrated by an experiment that involved drawing a series of red and black balls from one of two concealed "bingo baskets". Subjects knew that one basket contained 60% black and 40% red balls; the other, 40% black and 60% red. The experimenters looked at what happened when balls of alternating color were drawn in turn, a sequence that does not favor either basket. After each ball was drawn, subjects in one group were asked to state out loud their judgments of the probability that the balls were being drawn from one or the other basket. These subjects tended to grow more confident with each successive draw—whether they initially thought the basket with 60% black balls or the one with 60% red balls was the more likely source, their estimate of the probability increased. Another group of subjects were asked to state probability estimates only at the end of a sequence of drawn balls, rather than after each ball. They did not show the polarization effect, suggesting that it does not necessarily occur when people simply hold opposing positions, but rather when they openly commit to them.[35]

Strong opinions on an issue such as gun ownership can bias how someone interprets new evidence.

A less abstract study was the Stanford biased interpretation experiment in which subjects with strong opinions about the death penalty read about mixed experimental evidence. Twenty-three percent of the subjects reported that their views had become more extreme, and this self-reported shift correlated strongly with their initial attitudes.[21] In later experiments, subjects also reported their opinions becoming more extreme in response to ambiguous information. However, comparisons of their attitudes before and after the new evidence showed no significant change, suggesting that the self-reported changes might not be real.[24] [34] [36] Based on these experiments, Deanna Kuhn and Joseph Lao concluded that polarization is a real phenomenon but far from inevitable, only happening in a small minority of cases. They found that it was prompted not only by considering mixed evidence, but by merely thinking about the topic.[34]

Charles Taber and Milton Lodge argued that the Stanford team's result had been hard to replicate because the arguments used in later experiments were too abstract or confusing to evoke an emotional response. The Taber and Lodge study used the emotionally charged topics of gun control and affirmative action.[24] They measured the attitudes of their subjects towards these issues before and after reading arguments on each side of the debate. Two groups of subjects showed attitude polarization; those with strong prior opinions and those who were politically knowledgeable. In part of this study, subjects chose which information sources to read, from a list prepared by the experimenters. For example they could read the National Rifle Association's and the Brady Anti-Handgun Coalition's arguments on gun control. Even when instructed to be even-handed, subjects were more likely to read arguments that supported their existing attitudes. This biased search for information correlated well with the polarization effect.[24]

Persistence of discredited beliefs

"[B]eliefs can survive potent logical or empirical challenges. They can survive and even be bolstered by evidence that most uncommitted observers would agree logically demands some weakening of such beliefs. They can even survive the total destruction of their original evidential bases."

—Lee Ross and Craig Anderson[37]

Confirmation biases can be used to explain why some beliefs remain when the initial evidence for them is removed.[38] This belief perseverance effect has been shown by a series of experiments using what is called the "debriefing paradigm": subjects examine faked evidence for a hypothesis, their attitude change is measured, then they learn that the evidence was fictitious. Their attitudes are then measured once more to see if their belief returns to its previous level.[37]

A typical finding is that at least some of the initial belief remains even after a full debrief.[39] In one experiment, subjects had to distinguish between real and fake suicide notes. The feedback was random: some were told they had done well while others were told they had performed badly. Even after being fully debriefed, subjects were still influenced by the feedback. They still thought they were better or worse than average at that kind of task, depending on what they had initially been told.[40]

In another study, subjects read job performance ratings of two firefighters, along with their responses to a risk aversion test.[37] These fictional data were arranged to show either a negative or positive association between risk-taking attitudes and job success.[41] Even if these case studies had been true, they would have been scientifically poor evidence. However, the subjects found them subjectively persuasive.[41] When the case studies were shown to be fictional, subjects' belief in a link diminished, but around half of the original effect remained.[37] Follow-up interviews established that the subjects had understood the debriefing and taken it seriously. Subjects seemed to trust the debriefing, but regarded the discredited information as irrelevant to their personal belief.[41]

Preference for early information

Experiments have shown that information is weighted more strongly when it appears early in a series, even when the order is unimportant. For example, people form a more positive impression of someone described as "intelligent, industrious, impulsive, critical, stubborn, envious" than when they are given the same words in reverse order.[42] This *irrational primacy effect* is independent of the primacy effect in memory in which the earlier items in a series leave a stronger memory trace.[42] Biased interpretation offers an explanation for this effect: seeing the initial evidence, people form a working hypothesis that affects how they interpret the rest of the information.[38]

One demonstration of irrational primacy involved colored chips supposedly drawn from two urns. Subjects were told the color distributions of the urns, and had to estimate the probability of a chip being drawn from one of them.[42] In fact, the colors appeared in a pre-arranged order. The first thirty draws favored one urn and the next thirty favored the other.[38] The series as a whole was neutral, so rationally, the two urns were equally likely. However, after sixty draws, subjects favored the urn suggested by the initial thirty.[42]

Another experiment involved a slide show of a single object, seen as just a blur at first and in slightly better focus with each succeeding slide.[42] After each slide, subjects had to state their best guess of what the object was. Subjects whose early guesses were wrong persisted with those guesses, even when the picture was sufficiently in focus that other people could readily identify the object.[38]

Illusory association between events

Illusory correlation is the tendency to see non-existent correlations in a set of data.[43] This tendency was first demonstrated in a series of experiments in the late 1960s.[44] In one experiment, subjects read a set of psychiatric case studies, including responses to the Rorschach inkblot test. They reported that the homosexual men in the set were more likely to report seeing buttocks, anuses or sexually ambiguous figures in the inkblots. In fact the case studies were fictional and, in one version of the experiment, had been constructed so that the homosexual men were less likely to report this imagery.[43] In a survey, a group of experienced psychoanalysts reported the same set of illusory associations with homosexuality.[43] [44]

Another study recorded the symptoms experienced by arthritic patients, along with weather conditions over a 15-month period. Nearly all the patients reported that their pains were correlated with weather conditions, although the real correlation was zero.[45]

This effect is a kind of biased interpretation, in that objectively neutral or unfavorable evidence is interpreted to support existing beliefs. It is also related to biases in hypothesis-testing behavior.[46] In judging whether two events, such as illness and bad weather, are correlated, people rely heavily on the number of *positive-positive* cases: in this example, instances of both pain and bad weather. They pay relatively little attention to the other kinds of observation (of no pain and/or good weather).[47] This parallels the reliance on positive tests in hypothesis testing.[46] It may also reflect selective recall, in that people may have a sense that two events are correlated because it is easier to recall times when they happened together.[46]

Example

Days	Rain	No rain
Arthritis	14	6
No arthritis	7	2

In the above fictional example, arthritic symptoms are more likely on days with no rain. However, people are likely to focus on the relatively large number of days which have both rain and symptoms. By concentrating on one cell of the table rather than all four, people can misperceive the relationship, in this case associating rain with arthritic symptoms.[48]

History

Informal observation

Francis Bacon

Before psychological research on confirmation bias, the phenomenon had been observed anecdotally by writers, including the Greek historian Thucydides (c. 460 BC – c. 395 BC), Italian poet Dante Alighieri (1265–1321), English philosopher and scientist Francis Bacon (1561–1626),[49] and Russian author Leo Tolstoy (1828–1910). Thucydides, in the *History of the Peloponnesian War* wrote, "it is a habit of mankind ... to use sovereign reason to thrust aside what they do not fancy."[50] In the *Divine Comedy*, St. Thomas Aquinas cautions Dante when they meet in Paradise, "opinion—hasty—often can incline to the wrong side, and then affection for one's own opinion binds, confines the mind."[51] Bacon, in the *Novum Organum*, wrote,

> The human understanding when it has once adopted an opinion ... draws all things else to support and agree with it. And though there be a greater number and weight of instances to be found on the other side, yet these it either neglects or despises, or else by some distinction sets aside or rejects[.][52]

Bacon said that biased assessment of evidence drove "all superstitions, whether in astrology, dreams, omens, divine judgments or the like".[52] In his essay "What Is Art?", Tolstoy wrote,

> I know that most men—not only those considered clever, but even those who are very clever, and capable of understanding most difficult scientific, mathematical, or philosophic problems—can very seldom discern even the simplest and most obvious truth if it be such as to oblige them to admit the falsity of conclusions they have formed, perhaps with much difficulty—conclusions of which they are proud, which they have taught to others, and on which they have built their lives.[53]

Wason's research on hypothesis-testing

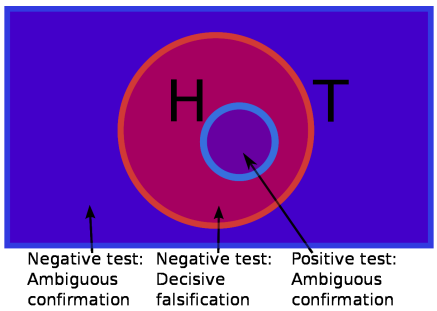
The term "confirmation bias" was coined by English psychologist Peter Wason.[54] For an experiment published in 1960, he challenged subjects to identify a rule applying to triples of numbers. At the outset, they were told that (2,4,6) fits the rule. Subjects could generate their own triples and the experimenter told them whether or not each triple conformed to the rule.[55] [56]

While the actual rule was simply "any ascending sequence", the subjects had a great deal of difficulty in arriving at it, often announcing rules that were far more specific, such as "the middle number is the average of the first and last".[55] The subjects seemed to test only positive examples—triples that obeyed their hypothesized rule. For example, if they thought the rule was, "Each number is two greater than its predecessor", they would offer a triple that fit this rule, such as (11,13,15) rather than a triple that violates it, such as (11,12,19).[57]

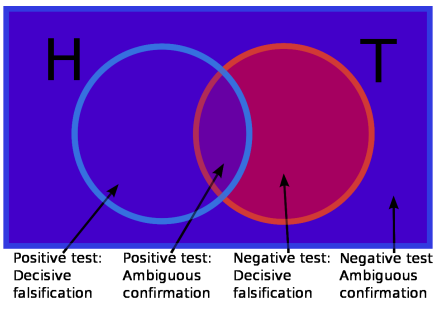
Wason accepted falsificationism, according to which a scientific test of a hypothesis is a serious attempt to falsify it. He interpreted his results as showing a preference for confirmation over falsification, hence the term "confirmation bias".[58] [59] Wason also used confirmation bias to explain the results of his selection task experiment.[60] In this task, subjects are given partial information about a set of objects, and have to specify what further information they would need to tell whether or not a conditional rule ("If A, then B") applies. It has been found repeatedly that people perform badly on various forms of this test, in most cases ignoring information that could potentially refute the rule.[61] [62]

Klayman and Ha's critique

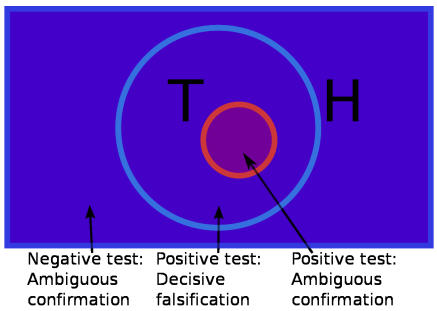
A 1987 paper by Joshua Klayman and Young-Won Ha argued that the Wason experiments had not actually demonstrated a bias towards confirmation. Instead, Klayman and Ha interpreted the results in terms of a tendency to make tests that are consistent with the working hypothesis.[63] They called this the "positive test strategy".[8] This strategy is an example of a heuristic: a reasoning shortcut that is imperfect but easy to compute.[2] Klayman and Ha used Bayesian probability and information theory as their standard of hypothesis-testing, rather than the falsificationism used by Wason. According to these ideas, each answer to a question yields a different amount of information, which depends on the person's prior beliefs. Thus a scientific test of a hypothesis is one that is expected to produce the most information. Since the information content depends on initial probabilities, a positive test can either be highly informative or uninformative. Klayman and Ha argued that when people think about realistic problems, they are looking for a specific answer with a small initial probability. In this case, positive tests are usually more informative than negative tests.[13] However, in Wason's rule discovery task the answer—three numbers in ascending order—is very broad, so positive tests are unlikely to yield informative answers. Klayman and Ha supported their analysis by citing an experiment that used the labels "DAX" and "MED" in place of "fits the rule" and "doesn't fit the rule". This avoided implying that the aim was to find a low-probability rule. Subjects had much more success with this version of the experiment.[64] [65]



If the true rule (T) encompasses the current hypothesis (H), then positive tests (examining an H to see if it is T) will not show that the hypothesis is false.



If the true rule (T) *overlaps* the current hypothesis (H), then either a negative test or a positive test can potentially falsify H.



When the working hypothesis (H) includes the true rule (T) then positive tests are the *only* way to falsify H.

In light of this and other critiques, the focus of research moved away from confirmation versus falsification to examine whether people test hypotheses in an informative way, or an uninformative but positive way. The search for "true" confirmation bias led psychologists to look at a wider range of effects in how people process information.[66]

Explanations

Confirmation bias is often described as a result of automatic processing. Individuals do not use deceptive strategies to fake data, but forms of information processing that take place more or less unintentionally.[14] [67] According to Robert Maccoun, most biased evidence processing occurs unintentionally through a combination of both "hot" (i.e., motivated) and "cold" (i.e., cognitive) mechanisms.[68]

Cognitive explanations for confirmation bias are based on limitations in people's ability to handle complex tasks, and the shortcuts, called "heuristics", that they use.[69] For example, people may judge the reliability of evidence by using the *availability heuristic*, i.e. how readily a particular idea comes to mind.[70] It is also possible that people can only focus on one thought at a time, so find it difficult to test alternative hypotheses in parallel.[71] Another heuristic is the positive test strategy identified by Klayman and Ha, in which people test a hypothesis by examining cases where they expect a property or event to occur. This heuristic avoids the difficult or impossible task of working out how diagnostic each possible question will be. However, it is not universally reliable, so people can overlook challenges to their existing beliefs.[13] [72]

Motivational explanations involve an effect of desire on belief, sometimes called "wishful thinking".[73] [74] It is known that people prefer pleasant thoughts over unpleasant ones in a number of ways: this is called the "Pollyanna principle".[75] Applied to arguments or sources of evidence, this could explain why desired conclusions are more likely to be believed true.[73] According to experiments that manipulate the desirability of the conclusion, people demand a high standard of evidence for unpalatable ideas and a low standard for preferred ideas. In other words, they ask, "Can I believe this?" for some suggestions and, "Must I believe this?" for others.[76] [77] Although consistency is a desirable feature of attitudes, an excessive drive for consistency is another potential source of bias because it may prevent people from neutrally evaluating new, surprising information.[73] Social psychologist Ziva Kunda combines the cognitive and motivational theories, arguing that motivation creates the bias, but cognitive factors determine the size of the effect.[78]

Explanations in terms of cost-benefit analysis assume that people do not just test hypotheses in a disinterested way, but assess the costs of different errors.[79] Using ideas from evolutionary psychology, James Friedrich suggests that people do not primarily aim at truth in testing hypotheses, but try to avoid the most costly errors. For example, employers might ask one-sided questions in job interviews because they are focused on weeding out unsuitable candidates.[80] Yaacov Trope and Akiva Liberman's refinement of this theory assumes that people compare the two different kinds of error: accepting a false hypothesis or rejecting a true hypothesis. For instance, someone who

underestimates a friend's honesty might treat him or her suspiciously and so undermine the friendship. Overestimating the friend's honesty may also be costly, but less so. In this case, it would be rational to seek, evaluate or remember evidence of their honesty in a biased way.[81] When someone gives an initial impression of being introverted or extraverted, questions that match that impression come across as more empathic.[82] This suggests that when talking to someone who seems to be an introvert, it is a sign of better social skills to ask, "Do you feel awkward in social situations?" rather than, "Do you like noisy parties?" The connection between confirmation bias and social skills was corroborated by a study of how college students get to know other people. Highly self-monitoring students, who are more sensitive to their environment and to social norms, asked more matching questions when interviewing a high-status staff member than when getting to know fellow students.[82]

Consequences

In finance

Confirmation bias can lead investors to be overconfident, ignoring evidence that their strategies will lose money.[6] [83] In studies of political stock markets, investors made more profit when they resisted bias. For example, participants who interpreted a candidate's debate performance in a neutral rather than partisan way were more likely to profit.[84] To combat the effect of confirmation bias, investors can try to adopt a contrary viewpoint "for the sake of argument".[85] One such technique involves imagining that their investments have collapsed and asking why this might happen.[6]

In physical and mental health

Raymond Nickerson, a psychologist, blames confirmation bias for the ineffective medical procedures that were used for centuries before the arrival of scientific medicine.[86] If a patient recovered, medical authorities counted the treatment as successful, rather than looking for alternative explanations such as that the disease had run its natural course.[86] Biased assimilation is a factor in the modern appeal of alternative medicine, whose proponents are swayed by positive anecdotal evidence but treat scientific evidence hyper-critically.[87] [88] [89]

Cognitive therapy was developed by Aaron T. Beck in the early 1960s and has become a popular approach.[90] According to Beck, biased information processing is a factor in depression.[91] His approach teaches people to treat evidence impartially, rather than selectively reinforcing negative outlooks.[49] Phobias and hypochondria have also been shown to involve confirmation bias for threatening information.[92]

In politics and law

Nickerson argues that reasoning in judicial and political contexts is sometimes subconsciously biased, favoring conclusions that judges, juries or governments have already committed to.[93] Since the evidence in a jury trial can be complex, and jurors often reach decisions about the verdict early on, it is reasonable to expect an attitude polarization effect. The prediction that jurors will become more extreme in their views as they see more evidence has been borne out in experiments with mock trials.[94] [95] Both inquisitorial and adversarial criminal justice systems are affected by confirmation bias.[96]

Mock trials allow researchers to examine confirmation biases in a realistic setting.

Confirmation bias can be a factor in creating or extending conflicts, from emotionally charged debates to wars: by interpreting the evidence in their favor, each opposing party can become overconfident that it is in the stronger position.[97] On the other hand, confirmation bias can result in people ignoring or misinterpreting the signs of an imminent or incipient conflict. For example, psychologists Stuart Sutherland and Thomas Kida have each argued that US Admiral Husband E. Kimmel showed confirmation bias when playing down the first signs of the Japanese attack on Pearl Harbor.[61] [98]

A two-decade study of political pundits by Philip E. Tetlock found that, on the whole, their predictions were not much better than chance. Tetlock divided experts into "foxes" who maintained multiple hypotheses, and "hedgehogs" who were more dogmatic. In general, the hedgehogs were much less accurate. Tetlock blamed their failure on confirmation bias—specifically, their inability to make use of new information that contradicted their existing theories.[99]

In the paranormal

One factor in the appeal of psychic "readings" is that listeners apply a confirmation bias which fits the psychic's statements to their own lives.[100] By making a large number of ambiguous statements in each sitting, the psychic gives the client more opportunities to find a match. This is one of the techniques of cold reading, with which a psychic can deliver a subjectively impressive reading without any prior information about the client.[100] Investigator James Randi compared the transcript of a reading to the client's report of what the psychic had said, and found that the client showed a strong selective recall of the "hits".[101]

As a "striking illustration" of confirmation bias in the real world, Nickerson mentions numerological pyramidology: the practice of finding meaning in the proportions of the Egyptian pyramids.[102] There are many different length measurements that can be made of, for example, the Great Pyramid of Giza and many ways to combine or manipulate them. Hence it is almost inevitable that people who look at these numbers selectively will find superficially impressive correspondences, for example with the dimensions of the Earth.[102]

In scientific procedure

A distinguishing feature of scientific thinking is the search for falsifying as well as confirming evidence.[103] However, many times in the history of science, scientists have resisted new discoveries by selectively interpreting or ignoring unfavorable data.[103] Previous research has shown that the assessment of the quality of scientific studies seems to be particularly vulnerable to confirmation bias. It has been found several times that scientists rate studies that report findings consistent with their prior beliefs more favorably than studies reporting findings inconsistent with their previous beliefs.[67] [104] [105] However, assuming that the research question is relevant, the experimental design adequate and the data are clearly and comprehensively described, the found results should be of importance to the scientific community and should not be viewed prejudicially—regardless of whether they conform to current theoretical predictions.[105] Confirmation bias may thus be especially harmful to objective evaluations regarding nonconforming results, since biased individuals may regard opposing evidence to be weak in principle and give little serious thought to revising their beliefs.[104] Scientific innovators often meet with resistance from the scientific community, and research presenting controversial results frequently receives harsh peer review.[106] In the context of scientific research, confirmation biases can sustain theories or research programs in the face of inadequate or even contradictory evidence;[61] [107] the field of parapsychology has been particularly affected.[108] An experimenter's confirmation bias can potentially affect which data are reported. Data that conflict with the experimenter's expectations may be more readily discarded as unreliable, producing the so-called file drawer effect. To combat this tendency, scientific training teaches ways to avoid bias.[109] Experimental designs involving randomization and double blind trials, along with the social process of peer review, are thought to mitigate the effect of individual scientists' biases,[109] [110] although it has been argued that such biases can play a role in the peer review process itself.[105]

In self-image

Social psychologists have identified two tendencies in the way people seek or interpret information about themselves. *Self-verification* is the drive to reinforce the existing self-image and *self-enhancement* is the drive to seek positive feedback. Both are served by confirmation biases.[111] In experiments where people are given feedback that conflicts with their self-image, they are less likely to attend to it or remember it than when given self-verifying feedback.[112] [113] [114] They reduce the impact of such information by interpreting it as unreliable.[112] [115] [116] Similar experiments have found a preference for positive feedback, and the people who give it, over negative feedback.[111]

Notes

[1] David Perkins, a geneticist, coined the term "myside bias" referring to a preference for "my" side of an issue. (Baron 2000, p. 195)

[2] Plous 1993, p. 233

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[5] "Assimilation bias" is another term used for biased interpretation of evidence. (Risen & Gilovich 2007, p. 113)

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[8] Kunda 1999, pp. 112–115

[9] Baron 2000, pp. 162–164

[10] Kida 2006, pp. 162–165

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[23] Vyse 1997, p. 122

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the most slow-witted man if he has not formed any idea of them already; but the simplest thing cannot be made clear to the most intelligent man if he is firmly persuaded that he knows already, without a shadow of doubt, what is laid before him" (ch. 3). Translated from the Russian by Constance Garnett, New York, 1894. Project Gutenberg edition (http://www.gutenberg.org/etext/4602) released November 2002. Retrieved 2009-08-24.

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External links

- Skeptic's Dictionary: confirmation bias (http://skepdic.com/confirmbias.html) by Robert T. Carroll
- Teaching about confirmation bias (http://www.devpsy.org/teaching/method/confirmation_bias.html), class handout and instructor's notes by K. H. Grobman
- Confirmation bias learning object (http://hosted.xamai.ca/confbias/), interactive number triples exercise by Rod McFarland, Simon Fraser University
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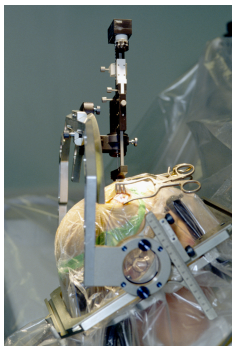
Placebo



The placebo effect can be produced by inert tablets, by sham surgery, and by false information, such as when electrical stimulation is turned "off" in those with Parkinson's disease implanted brain electrodes.[1]

A **placebo** (/plə'siboʊ/; Latin: *I shall please*[2]) is a sham or simulated medical intervention. Sometimes patients given a placebo treatment will have a perceived or actual improvement in a medical condition, a phenomenon commonly called the **placebo effect**.

In medical research, placebos are given as control treatments and depend on the use of measured deception. Common placebos are inert tablets, sham surgery,[3] and other procedures based on false information.[1] However, placebos can also have a surprisingly positive effect on a patient who knows that the given treatment is without any active drug, as compared with a control group who knowingly did *not* get a placebo.[4]

In one common placebo procedure, however, a patient is given an inert pill, told that it may improve his/her condition, but not told that it is in fact inert. Such an intervention may cause the patient to believe the treatment will change his/her condition; and this belief may produce a subjective perception of a therapeutic effect, causing the patient to feel their condition has improved — or an actual improvement in their condition. This phenomenon is known as the placebo effect.

Placebos are widely used in medical research and medicine,[5] and the placebo effect is a pervasive phenomenon;[5] in fact, it is part of the response to any active medical intervention.[6] The placebo effect points to the importance of perception and the brain's role in physical health. However, when used as treatment in clinical medicine (as opposed to laboratory research), the deception involved in the use of placebos creates tension between the Hippocratic Oath and the honesty of the doctor-patient relationship.[7] The United Kingdom Parliamentary Committee on Science and Technology has stated that: "...prescribing placebos... usually relies on some degree of patient deception" and "prescribing pure placebos is bad medicine. Their effect is unreliable and unpredictable and cannot form the sole basis of any treatment on the NHS."[3]

Since the publication of Henry K. Beecher's *The Powerful Placebo* in 1955, the phenomenon has been considered to have clinically important effects.[8] This view was notably challenged when, in 2001, a systematic review of clinical trials concluded that there was no evidence of clinically important effects, except perhaps in the treatment of pain and continuous subjective outcomes.[8] The article received a flurry of criticism,[9] but the authors later published a Cochrane review with similar conclusions (updated as of 2010).[10] Most studies have attributed the difference from baseline till the end of the trial to a placebo effect, but the reviewers examined studies which had both placebo and untreated groups in order to distinguish the placebo effect from the natural progression of the disease.[8] However these conclusions have been criticized because of the great variety of diseases - more than 40 - in this metastudy. The effect of placebo is very different in different diseases. By pooling quite different diseases the results can be levelled out.

Definitions, effects, and ethics

A placebo has been defined as "a substance or procedure… that is objectively without specific activity for the condition being treated".[9] Under this definition, a wide variety of things can be placebos and exhibit a placebo effect. Pharmacological substances administered through any means can act as placebos, including pills, creams, inhalants, and injections. Medical devices such as ultrasound can act as placebos.[11] [12] Sham surgery,[13] [14] [15] sham electrodes implanted in the brain,[1] and sham acupuncture, either with sham needles or on fake acupuncture points, have all exhibited placebo effects.[16] Bedding not treated to reduce allergies has been used as a placebo to control for treated bedding.[17] The physician has even been called a placebo;[18] 33–34 a study found that patient recovery can be increased by words that suggest the patient “would be better in a few days”, and if the patient is given treatment, that “the treatment would certainly make him better” rather than negative words such as “I am not sure that the treatment I am going to give you will have an effect”.[19] The placebo effect may be a component of pharmacological therapies: Pain killing and anxiety reducing drugs that are infused secretly without an individual’s knowledge are less effective than when a patient knows they are receiving them. Likewise, the effects of stimulation from implanted electrodes in the brains of those with advanced Parkinson's disease are greater when they are aware they are receiving this stimulation.[20] Sometimes administering or prescribing a placebo merges into fake medicine.

The placebo effect has sometimes been defined as a physiological effect caused by the placebo, but Moerman and Jonas have pointed out that this seems illogical, as a placebo is an inert substance that does not directly cause anything. Instead they introduced the word "*meaning response*" for the meaning that the brain associates with the placebo, which causes a physiological placebo effect. They propose that the placebo, which may be unethical, could be avoided entirely if doctors comfort and encourage their patients' health.[9] Ernst and Resch also attempted to distinguish between the "true" and "perceived" placebo effect, as they argued that some of the effects attributed to the placebo effect could be due to other factors.[21]

The placebo effect has been controversial throughout history. Notable medical organizations have endorsed it,[22] but in 1903 Richard Cabot concluded that it should be avoided because it is deceptive. Newman[23] points out the "placebo paradox", – it may be unethical to use a placebo, but also unethical "*not* to use something that heals". He suggests to solve this dilemma by appropriating the meaning response in medicine, that is make use of the placebo effect, as long as the "one administering… is honest, open, and believes in its potential healing power".[7] Another possible resolution of the ethical dilemma might come from the "honest placebo" effect found in a 2010 study[4] carried out by researchers in the Program in Placebo Studies at the Harvard Medical School, where patients with irritable bowel syndrome experienced a significant beneficial effect even though they were told the pills they were taking were placebos, as compared to a control group who received no pills.

History

The word 'placebo', Latin for "I will please", dates back to a Latin translation of the Bible by Jerome.[24] It was first used in a medicinal context in the 18th century. In 1785 it was defined as a "commonplace method or medicine" and in 1811 it was defined as "any medicine adapted more to please than to benefit the patient", sometimes with a derogatory implication[25] but not with the implication of no effect.[26] Placebos were widespread in medicine until the 20th century, and they were sometimes endorsed as necessary deceptions.[22] In 1903 Richard Cabot said that he was brought up to use placebos,[22] but he ultimately concluded by saying that "I have not yet found any case in which a lie does not do more harm than good".[7] In 1961 Henry K. Beecher found[27] that surgeons he categorized as enthusiasts relieved their patients' chest pain and heart problems more than skeptic surgeons.[7] In 1961 Walter Kennedy introduced the word nocebo.[22] Beginning in the 1960s, the placebo effect became widely recognized and placebo controlled trials became the norm in the approval of new medications.[28] Later, researchers became interested in understanding the placebo effect, rather than just controlling for its effects, and in 2011, a Program in Placebo Studies was established at the Harvard Medical School.

Mechanism of the effect

The phenomenon of an inert substance's resulting in a patient's medical improvement is called the **placebo effect**. The phenomenon is related to the perception and expectation that the patient has; if the substance is viewed as helpful, it can heal, but, if it is viewed as harmful, it can cause negative effects, which is known as the nocebo effect. The basic mechanisms of placebo effects have been investigated since 1978, when it was found that the opioid antagonist naloxone could block placebo painkillers, suggesting that endogenous opioids are involved.[29]

Expectancy and conditioning

In 1985, Irving Kirsch hypothesized that placebo effects are produced by the self-fulfilling effects of response expectancies, in which the belief that one will feel different leads a person to actually feel different.[30] According to this theory, the belief that one has received an active treatment can produce the subjective changes thought to be produced by the real treatment. Placebos can act similarly through classical conditioning, wherein a placebo and an actual stimulus are used simultaneously until the placebo is associated with the effect from the actual stimulus.[31] Both conditioning and expectations play a role in placebo effect,[32] and make different kinds of contribution. Conditioning has a longer-lasting effect,[33] and can affect earlier stages of information processing.[34] The

expectancy effect can be enhanced through factors such as the enthusiasm of the doctor, differences in size and color of placebo pills, or the use of other interventions such as injections. In one study, the response to a placebo increased from 44% to 62% when the doctor treated them with "warmth, attention, and confidence".[35] Expectancy effects have been found to occur with a range of substances. Those that think that a treatment will work display a stronger placebo effect than those that do not, as evidenced by a study of acupuncture.[36] [37]

Because the placebo effect is based upon expectations and conditioning, the effect disappears if the patient is told that their expectations are unrealistic, or that the placebo intervention is ineffective. A conditioned pain reduction can be totally removed when its existence is explained.[38] It has also been reported of subjects given placebos in a trial of anti-depressants, that "Once the trial was over and the patients who had been given placebos were told as much, they quickly deteriorated."[39]

A placebo described as a muscle relaxant will cause muscle relaxation and, if described as the opposite, muscle tension.[40] A placebo presented as a stimulant will have this effect on heart rhythm, and blood pressure, but, when administered as a depressant, the opposite effect.[41] The perceived consumption of caffeine has been reported to cause similar effects even when decaffeinated coffee is consumed,[42] [43] although a 2003 study found only limited support for this.[44] Alcohol placebos can cause intoxication[45] and sensorimotor impairment.[46] Perceived ergogenic aids can increase endurance,[47] speed[48] and weight-lifting ability,[49] leading to the question of whether placebos should be allowed in sport competition.[50] Placebos can help smokers quit.[51] Perceived allergens that are not truly allergenic can cause allergies.[52] Interventions such as psychotherapy can have placebo effects.[53] pp 164–173 The effect has been observed in the transplantation of human embryonic neurons into the brains of those with advanced Parkinson's disease.[54]

Because placebos are dependent upon perception and expectation, various factors that change the perception can increase the magnitude of the placebo response. For example, studies have found that the color and size of the placebo pill makes a difference, with "hot-colored" pills working better as stimulants while "cool-colored" pills work better as depressants. Capsules rather than tablets seem to be more effective, and size can make a difference.[55] One researcher has found that big pills increase the effect[56] while another has argued that the effect is dependent upon cultural background.[57] More pills,[58] branding,[59] past experience,[60] and high price[61] increase the effect of placebo pills. Injection[62] and acupuncture[16] have larger effect than pills. Proper adherence to placebos is associated with decreased mortality.[63]

Motivation may contribute to the placebo effect. The active goals of an individual changes his/her somatic experience by altering the detection and interpretation of expectation-congruent symptoms, and by changing the behavioral strategies a person pursues.[64] [65] Motivation may link to the meaning through which people experience illness and treatment. Such meaning is derived from the culture in which they live and which informs them about the nature of illness and how it responds to treatment. Research upon the placebo treatment of gastric and duodenal ulcers shows that this varies widely with society: those in Germany having a high-rate placebo effect while those in Brazil a low one.[9] Placebo effects in treating gastric ulcers is low in Brazil, higher in northern Europe (Denmark, Netherlands), and extremely high in Germany. But the placebo effect for hypertension is lower in Germany than elsewhere[66] Social observation can induce a placebo effect such when a person sees another having reduced pain following what they believe is a pain reducing procedure.[67]

The placebo effect can work selectively. If an analgesic placebo cream is applied on one hand, it will reduce pain only in that hand and not elsewhere on the body[68] If a person is given a placebo under one name, and they respond, they will respond in the same way on a later occasion to that placebo under that name but not if under another.[69]

Placebo effect and the brain

Functional imaging upon placebo analgesia shows that it links to the activation, and increased functional correlation between this activation, in the anterior cingulate, prefrontal, orbitofrontal and insular cortices, nucleus accumbens, amygdala, the brainstem periaqueductal gray matter,[70] [71] [72] and the spinal cord.[73] [74] [75] [76]

These changes can act upon the brain's early stages of information processing: Research using evoked brain potentials upon painful laser pulses, for example, finds placebo effects upon the N2–P2, a biphasic negative–positive complex response, the N2 peak of which is at about 230 ms, and the P2 one at about 380 ms.[34] They occur not only during placebo analgesia but after receiving the analgesic placebo (the areas are different here, and involve the medial prefrontal cortex, posterior parietal cortex and inferior parietal lobule).[77]

Different areas in the higher brain have different functions. The prefrontal involvement could be related to recalling the placebo and maintaining its cognitive presence in a "self-reinforcing feedback loop" (during pain an individual recalls having taken the placebo and reduced pain reinforces its status as an analgesic).[78] The rostral anterior cingulate cortex (rACC) and its subcortical connectivity could be related to the expectation of potential pain stimuli[79] [80]

The higher brain works by regulating subcortical processes. High placebo responses link with enhanced dopamine and mu-opioid activity in the circuitry for reward responses and motivated behavior of the nucleus accumbens, and, on the converse, anti-analgesic nocebos responses were associated with deactivation in this part of the brain of dopamine and opioid release.[71] (It has been known that placebo analgesia depends upon the release in the brain of endogenous opioids since 1978.[81]) Such analgesic placebos activation changes processing lower down in the brain by enhancing the descending inhibition through the periaqueductal gray[71] on spinal nociceptive reflexes, while the expectations of anti-analgesic nocebos acts in the opposite way to block this.[73]

The brain is also involved in less-studied ways upon nonanalgesic placebo effects:

- Parkinson's disease: Placebo relief is associated with the release of dopamine in the brain.[82]
- Depression: Placebos reducing depression affect many of the same areas that are activated by antidepressants with the addition of the prefrontal cortex[83] [84]
- Caffeine: Placebo-caffeinated coffee causes an increase in bilateral dopamine release in the thalamus.[85]
- Glucose: The expectation of an intravenous injection of glucose increases the release of dopamine in the basal ganglia of men (but not women).[86]
- Methylphenidate: The expectation of intravenous injection of this drug in inexperienced drug users increased the release of dopamine in the ventral cingulate gyrus and nucleus accumbens, with this effect being largest in those with no prior experience of the drug.[87]

Present functional imaging upon placebo analgesia has been summarized as showing that the placebo response is "mediated by "top-down" processes dependent on frontal cortical areas that generate and maintain cognitive expectancies. Dopaminergic reward pathways may underlie these expectancies".[88] "Diseases lacking major 'top-down' or cortically based regulation may be less prone to placebo-related improvement".[89]

Brain and body

The brain has control over the body processes affected by placebos. Pain, motor fatigue, and fever are directly organized by the brain. Other processes usually regulated by the body such as the immune system are also controlled indirectly through the sympathetic and parasympathetic nervous system.

Research upon conditioning in animals shows the brain can learn control over them. In conditioning, a neutral stimulus saccharin is paired in a drink with an agent that produces an unconditioned response. For example, that agent might be cyclophosphamide that causes immunosuppression. After learning this pairing, the taste of saccharin by itself through neural top-down control created immunosuppression, as a new conditioned response.[90] Such conditioning has been found to affect a diverse variety of not just basic physiological processes in the immune

system but ones such as serum iron levels, oxidative DNA damage levels, and insulin secretion. This work was originally done on rats, however the same conditioning of basic physiological processes can also occur in humans. Recent reviews have argued the placebo effect is due to top-down control by the brain for immunity[91] and pain.[92] Pacheco-López and colleagues have raised the possibility of "neocortical-sympathetic-immune axis providing neuroanatomical substrates that might explain the link between placebo/conditioned and placebo/expectation responses."[91] pp 441

A recent fMRI study has shown that a placebo can reduce pain-related neural activity in the spinal cord, indicating that placebo effects can extend beyond the brain.[93]

Evolved health regulation

Evolutionary medicine identifies many symptoms such as fever, pain, and sickness behavior as evolved responses to protect or enhance the recovery from infection and injury. Fever, for example, is an evolved self-treatment that removes bacteria or viruses through raised body temperature. These evolved responses, however, also have a cost that depending upon circumstances can outweigh their benefit (due to this, for example, there is a reduction in fever during malnutrition or late pregnancy). According to the health management system theory proposed by Nicholas Humphrey, the brain has been selected to ensure that evolved responses are deployed only when the cost benefit is biologically advantageous. To do this, the brain factors in a variety of information sources, including the likelihood derived from beliefs that the body will get well without deploying its costly evolved responses. One such source of information is the knowledge the body is receiving care and treatment. The placebo effect in this perspective arises when false information about medications misleads the health management system about the likelihood of getting well so that it selects not to deploy an evolved self-treatment.[94]

Clinical utility

Duration

Placebo effects can last for a long time: over 8 weeks for panic disorder,[95] 6 months for angina pectoris,[96] and two and half years for rheumatoid arthritis.[97] Placebo effects after verbal suggestion for mild pain can be robust and still exist after being repeated ten times even if they have no actual pharmacological pain killing action.[38]

Clinical significance

Hróbjartsson and Peter Gøtzsche published a study in 2001[8] and a follow-up study in 2004[98] questioning the nature of the placebo effect. The studies were performed as two meta-analyses. They found that in studies with a binary outcome, meaning patients were classified as improved or not improved, the placebo group had no statistically significant improvement over the no-treatment group. Likewise, there was no significant placebo effect in studies in which objective outcomes (such as blood pressure) were measured by an independent observer. The placebo effect could be documented only in studies in which the outcomes (improvement or failure to improve) were reported by the subjects themselves. The authors concluded that the placebo effect does not have "powerful clinical effects," (*objective* effects) and that patient-reported improvements (*subjective* effects) in pain were small and could not be clearly distinguished from reporting bias. Other researchers (Wampold *et al.*) re-analysed the same data from the 2001 meta-analysis and concluded that the placebo effects for objective symptom measures are comparable to placebo effects for subjective ones and that the placebo effect can exceed the effect of the active treatment by 20% for disorders amenable to the placebo effect,[99] [100] a conclusion which Hróbjartsson & Gøtzsche described as "powerful spin".[101] Another group of researchers noted the dramatically different conclusions between these two sets of authors despite nearly identical meta-analytic results, and suggested that placebo effects are indeed significant but small in magnitude.[102]

Hróbjartsson and Gøtzsche's conclusion has been criticised on several grounds. Their meta-analysis covered studies into a highly mixed group of conditions: The placebo effect does occur with peripheral disease processes (such as hypertension, asthma, prostatic hyperplasia, anal fissure, bronchitis), though not for processes reflecting physical disease (such as venous leg ulcers, Crohn's disease, urinary tract infection, and chronic heart failure).[103] Placebos also do not work as strongly in clinical trials because the subjects do not know whether they might be getting a real treatment or a sham one. Where studies are made of placebos in which people think they are receiving actual treatment (rather than merely its possibility) the placebo effect has been observed.[104] Other writers have argued that the placebo effect can be reliably demonstrated under appropriate conditions.[105]

In another update by Hróbjartsson & Gøtzsche, published as a 2010 Cochrane systematic review which confirms and modifies their previous work, over 200 trials investigating 60 clinical conditions were included. Placebo interventions were again not found to have important clinical effects in general but may influence patient-reported outcomes in some situations, especially pain and nausea, although it was "difficult to distinguish patient-reported effects of placebo from response bias". The pooled relative risk they calculated for placebo was 0.93 (effect of only 7%) but significant. Effects were also found for phobia and asthma but were uncertain due to high risk of bias. In other conditions involving three or more trials, there was no statistically significant effect for smoking, dementia, depression, obesity, hypertension, insomnia and anxiety, although confidence intervals were wide. Several clinical (physical placebos, patient-involved outcomes, falsely informing patients there was no placebo) and methodological (small sample size, explicit aim of studying the placebo effect) factors were associated with higher effects of placebo. Despite low effects in general and the risk of bias, the authors acknowledged that large effects of placebo interventions may occur in certain situations.[106]

Negative effects

Similar to the placebo effect, inert substances have the potential to cause negative effects via the "nocebo effect" (Latin *nocebo* = "I will harm"). In this effect, giving an inert substance has negative consequences.[107]

Another negative consequence is that placebos can cause side-effects associated with real treatment.[108] One example of this is with those that have already taken an opiate, can then show respiratory depression when given it again in the form of a placebo.[109]

Withdrawal symptoms can also occur after placebo treatment. This was found, for example, after the discontinuation of the Women's Health Initiative study of hormone replacement therapy for menopause. Women had been on placebo for an average of 5.7 years. Moderate or severe withdrawal symptoms were reported by 40.5% of those on placebo compared to 63.3% of those on hormone replacement.[110]

Doctor-patient relationship

A study of Danish general practitioners found that 48% had prescribed a placebo at least 10 times in the past year.[5] The most frequently prescribed placebos were antibiotics for viral infections, and vitamins for fatigue. Specialists and hospital-based physicians reported much lower rates of placebo use. A 2004 study in the British Medical Journal of physicians in Israel found that 60% used placebos in their medical practice, most commonly to "fend off" requests for unjustified medications or to calm a patient.[111] The accompanying editorial concluded, "We cannot afford to dispense with any treatment that works, even if we are not certain how it does."[112] Other researches have argued that open provision of placebos for treating ADHD in children can be effective in maintaining ADHD children on lower stimulant doses in the short term.[113]

Critics of the practice responded that it is unethical to prescribe treatments that do not work, and that telling a patient (as opposed to a research test subject) that a placebo is a real medication is deceptive and harms the doctor-patient relationship in the long run. Critics also argued that using placebos can delay the proper diagnosis and treatment of serious medical conditions.

The following impracticalities exist with placebos: (See the BMJ posted responses to Spiegel's editorial rapid response online section.[112])

- Roughly only 30% of the population seems susceptible to placebo effects, and it is not possible to determine ahead of time whether a placebo will work or not. (However the placebo effect is zero in studies of blood poisoning and up to 80% in studies of wound on the duodenum).
- Patients rightfully want immediate relief or improvement from their illness or symptoms. A non-placebo can often provide that, while a placebo might not.
- Legitimate doctors and pharmacists could open themselves up to charges of fraud since sugar pills would cost pennies or cents for a bottle, but the price for a "real" medication would have to be charged to avoid making the patient suspicious.

About 25% of physicians in both the Danish and Israeli studies used placebos as a diagnostic tool to determine if a patient's symptoms were real, or if the patient was malingering. Both the critics and defenders of the medical use of placebos agreed that this was unethical. The British Medical Journal editorial said, "That a patient gets pain relief from a placebo does not imply that the pain is not real or organic in origin...the use of the placebo for 'diagnosis' of whether or not pain is real is misguided."

The placebo administration may prove to be a useful treatment in some specific cases where recommended drugs cannot be used. For example, burn patients who are experiencing respiratory problems cannot often be prescribed opioid (morphine) or opioid derivatives (pethidine), as these can cause further respiratory depression. In such cases placebo injections (normal saline, etc.) are of use in providing real pain relief to burn patients if those not in delirium are told they are being given a powerful dose of painkiller.

Referring specifically to homeopathy, the House of Commons of the United Kingdom Science and Technology Committee has stated:

> In the Committee's view, homeopathy is a placebo treatment and the Government should have a policy on prescribing placebos. The Government is reluctant to address the appropriateness and ethics of prescribing placebos to patients, which usually relies on some degree of patient deception. Prescribing of placebos is not consistent with informed patient choice-which the Government claims is very important-as it means patients do not have all the information needed to make choice meaningful.
>
> Beyond ethical issues and the integrity of the doctor-patient relationship, prescribing pure placebos is bad medicine. Their effect is unreliable and unpredictable and cannot form the sole basis of any treatment on the NHS.[3]

A survey in the United States of more than 10,000 physicians came to the result that while 24% of physicians would prescribe a treatment that is a placebo simply because the patient wanted treatment, 58% would not, and for the remaining 18%, it would depend on the circumstances.[114]

The individual

Who is affected

Placebos do not work for everyone.[115] [116] Henry K. Beecher, in a paper in 1955[117] suggested placebo effects occurred in about 35% of people. However, the response rate is wide, ranging from 0% up to nearly everyone. In a dental postoperative pain model, placebo analgesia occurred in 39%.[116] In research upon ischemic arm pain, placebo analgesia was found in 27%.[115] The placebo analgesia rate for cutaneous healing of left hand skin was 56%.[118]

Though not everyone responds to a placebo, neither does everyone respond to an active drug. The percentage of patients who reported relief following placebo (39%) is similar to the percentage following 4 mg (36%) and 6 mg (50%) of hidden morphine.[119]

Individual differences

In the 1950s, there was considerable research to find whether there was a specific personality to those that responded to placebos. The findings could not be replicated[120] and it is now thought to have no effect.[121]

The desire for relief from pain, "goal motivation", and how far pain is expected to be relieved increases placebo analgesia.[64] Another factor increasing the effectiveness of placebos is the degree to which a person attends to their symptoms, "somatic focus".[65] Individual variation in response to analgesic placebos has been linked to regional neurochemical differences in the internal affective state of the individuals experiencing pain.[122]

Those with Alzheimer's disease lose the capacity to be influenced by placebos, and this is attributed to the loss of their prefrontal cortex dependent capacity to have expectations.[123]

Children seem to have greater response than adults to placebos.[124]

Genes

In social anxiety disorder (SAD) an inherited variant of the gene for tryptophan hydroxylase 2 (enzyme that synthesizes the neurotransmitter serotonin) is linked to reduced amygdala activity and greater susceptibility to the placebo effect.[125] [126] [127] The authors note "additional work is necessary to elucidate the generalizability of the findings".

Symptoms and conditions

The placebo effect occurs more strongly in some conditions than others. One study found placebo effects are most likely to be found with the peripheral aspects of disease processes, rather than processes that reflect physical disease.[103] Dylan Evans has suggested as another factor, that placebos work most strongly upon conditions such as pain, swelling, stomach ulcers, depression, and anxiety that have been linked with activation of the acute-phase response.[53]

Pain

Placebo analgesia is more likely to work the more severe the pain.[128] One study found that for postoperative pain following the extraction of the third molar, saline injected while telling the patient it was a powerful painkiller was as potent as a 6–8 mg dose of morphine.[119]

Most research reports average reduction for a group of people, but this can be lower (some people do not respond). In one study using injection of capsaicin below the skin found that this reduced group average pain compared to no placebo by ~46% to ~57%.[68] Another measure is the ability to endure pain. In one study, placebos increased this on average by about 3.5 minutes compared to just under 14 minutes without it.[129] The average strength of placebos upon pain on a visual analog scale is 2 out of 10 units.[121] [130] Individuals who respond to placebos may show even

greater effects up to 5 out of 10 units.[115]

Depression

In 1998, a meta-analysis of published antidepressant trials found that 75% of the effectiveness of anti-depressant medication is due to the placebo effect and other non-specific effects, rather than the treatment itself.[131] Later, meta-analyses including data from unpublished trials found that the overall difference between drug and placebo is not clinically significant except in cases of very extreme depression,[132] [133] Another meta-analysis found that 79% of depressed patients receiving placebo remained well (for 12 weeks after an initial 6–8 weeks of successful therapy) compared to 93% of those receiving antidepressants.[134] A meta-analysis in 2002 found a 30% reduction in suicide and attempted suicide in the placebo groups compared to a 40% reduction in the treated groups.[135]

A 2002 article in The Washington Post titled "Against Depression, a Sugar Pill Is Hard to Beat" summarized research as follows: "In the majority of trials conducted by drug companies in recent decades, sugar pills have done as well as -- or better than -- antidepressants. Companies have had to conduct numerous trials to get two that show a positive result, which is the Food and Drug Administration's minimum for approval. The makers of Prozac had to run five trials to obtain two that were positive, and the makers of Paxil and Zoloft had to run even more".[39]

Gastric and duodenal ulcers

A meta-study of 31 placebo-controlled trials of the gastric acid secretion inhibitor drug cimetidine in the treatment of gastric or duodenal ulcers found that placebo treatments, in many cases, were as effective as active drugs: of the 1692 patients treated in the 31 trials, 76% of the 916 treated with the drug were "healed", and 48% of the 776 treated with placebo were "healed".[9] [136] These results were confirmed by the direct post-treatment endoscopy. It was also found that German placebos were "stronger" than others; and that, overall, different physicians evoked quite different placebo responses in the same clinical trial (p. 15). Moreover, in many of these trials the gap between the active drugs and the placebo controls was "not because [the trials' constituents] had high drug effectiveness, but because they had low placebo effectiveness" (p. 13).

In some trials, placebos were effective in 90% of the cases, whereas in others the placebos were effective in only 10% of the cases. It was argued that "what is demonstrated in [these] studies is not enhanced healing in drug groups but reduced healing in placebo groups" (p. 14). It was also noted the results of two studies (one conducted in Germany, the other in Denmark), which examined "ulcer relapse in healed patients" showed that the rate of relapse amongst those "healed" by the active drug treatment was *five times* that of those "healed" by the placebo treatment (pp. 14–15).

Chronic fatigue syndrome

It was previously assumed that placebo response rates in patients with chronic fatigue syndrome (CFS) are unusually high, "at least 30% to 50%", because of the subjective reporting of symptoms and the fluctuating nature of the condition. According to a meta-analysis and contrary to conventional wisdom, the pooled response rate in the placebo group was 19.6%, even lower than in some other medical conditions. The authors offer possible explanations for this result: CFS is widely understood to be difficult to treat, which could reduce expectations of improvement. In context of evidence showing placebos do not have powerful clinical effects when compared to no treatment, a low rate of spontaneous remission in CFS could contribute to reduced improvement rates in the placebo group. Intervention type also contributed to the heterogeneity of the response. Low patient and provider expectations regarding psychological treatment may explain particularly low placebo responses to psychiatric treatments.[137]

List of medical conditions

The effect of placebo treatments (an inert pill unless otherwise noted) has been studied for the following medical conditions:

- ADHD: adult,[138] child[113]
- Amalgam fillings: attributed symptoms (inert "chelation" therapy)[142]
- Anxiety disorders[147] [148]
- Asthma (water aerosol inhalant)[154]
- Asthma[158] [159]
- Autism: language and behavior problems[163] [164]
- Benign prostatic enlargement[168]
- Binge eating disorder[171]
- Bipolar mania[174]
- Cough[6]
- Crohn's disease[139]
- Depression (light treatment; low red light placebo)[143]
- Depression[131] [149] [150] [151]
- Dyspepsia and Stomach motility[155]
- Epilepsy[160]
- Erectile dysfunction[165]
- Food allergy: ability to eat ill-making foods[66] p. 54
- Gastric and duodenal ulcers[66] [136] [172]
- Headache[175]
- Heart failure, congestive[178]
- Herpes simplex[182]
- Hypertension: mild and moderate[62] [140]
- Irritable bowel syndrome[144] [145]
- Migraine prophylaxis[152]
- Multiple sclerosis[156]
- Nausea: gastric activity[161]
- Nausea: chemotherapy[166]
- Nausea and vomiting : postoperative (sham acupuncture)[169]
- Pain[121] [173]
- Panic disorders[176]
- Parkinson's disease[179] [180]
- Pathological gambling[183]
- Premenstrual dysphoric disorder.[141]
- Psoriatic arthritis[146]
- Reflux esophagitis[153]
- Restless leg syndrome[157]
- Rheumatic diseases[162]
- Sexual dysfunction: women[167]
- Social phobia[170]
- Third molar extraction swelling (sham ultra-sound)[11] [12]
- Ulcerative colitis[177]
- Vulvar vestibulitis[181]

Effects on research

Placebo-controlled studies

The placebo effect makes it more difficult to evaluate new treatments. Apparent benefits of a new treatment (usually a drug but not necessarily so) may not derive from the treatment but from the placebo effect. This is particularly likely, given that new therapies seem to have greater placebo effects. Clinical trials control for this effect by including a group of subjects that receives a sham treatment. The subjects in such trials are blinded as to whether they receive the treatment or a placebo. Clinical trials are often double-blinded so that the researchers also do not know which test subjects are receiving the active or placebo treatment.

The placebo effect in such clinical trials is weaker than in normal therapy since the subjects are not sure whether the treatment they are receiving is active.[104]

Knowingly giving a person a placebo when there is an effective treatment available is a bioethically complex issue. While placebo-controlled trials might provide information about the effectiveness of a treatment, it denies some patients what could be the best available (if unproven) treatment. Informed consent is usually required for a study to be considered ethical, including the disclosure that some test subjects will receive placebo treatments.

The ethics of placebo-controlled studies have been debated in the revision process of the Declaration of Helsinki. Of particular concern has been the difference between trials comparing inert placebos with experimental treatments, versus comparing the best available treatment with an experimental treatment; and differences between trials in the sponsor's developed countries versus the trial's targeted developing countries.[184]

A further issue of concern to pharmaceutical companies is that the effectiveness of placebos has increased over time,[185] thus making it more difficult to demonstrate the effectiveness of new drugs. The reason for the increased effectiveness in disputed.

Nocebo

In the opposite effect, a patient who disbelieves in a treatment may experience a worsening of symptoms. This effect, now called by analogy nocebo (Latin *nocebo* = "I shall harm") can be measured in the same way as the placebo effect, e.g., when members of a control group receiving an inert substance report a worsening of symptoms. The recipients of the inert substance may nullify the placebo effect intended by simply having a negative attitude towards the effectiveness of the substance prescribed, which often leads to a nocebo effect, which is not caused by the substance, but due to other factors, such as the patient's mentality towards his or her ability to get well, or even purely coincidental worsening of symptoms.[107]

Placebo ingredients

Placebos used in clinical trials have sometimes had unintended consequences. A report in the Annals of Internal Medicine that looked at details from 150 clinical trials found that certain placebos used in the trials affected the results. For example, one study on cholesterol-lowering drugs used olive oil and corn oil in the placebo pills. However, according to the report, this "may lead to an understatement of drug benefit: The monounsaturated and polyunsaturated fatty acids of these 'placebos,' and their antioxidant and anti-inflammatory effects, can reduce lipid levels and heart disease." Another example researchers reported in the study was a clinical trial of a new therapy for cancer patients suffering from anorexia. The placebo that was used included lactose. However, since cancer patients typically face a higher risk of lactose intolerance, the placebo pill might actually have caused unintended side-effects that made the experimental drug look better in comparison.[186] [187] [188]

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External links

- The Placebo Effect (http://skepdic.com/placebo.html) at the Skeptic's Dictionary
- The Placebo Effect (http://www.youtube.com/watch?v=udJ31KKXBKk) explained on YouTube
- Placebos: cracking the code part 1 (http://video.google.co.uk/videoplay?docid=4115610193400691959) part 2 (http://video.google.co.uk/videoplay?docid=-6942125248944933588) BBC/Discovery channel program
- "The Placebo Effect: Do You Believe Your Teacher?" (http://en.wikibooks.org/wiki/Bad_Science/Placebo/Article) Ben Goldacre on The Guardian and on Wikibooks.
- "Placebos are getting more effective. Drugmakers are desperate to know why." (http://www.wired.com/medtech/drugs/magazine/17-09/ff_placebo_effect) Wired magazine on the power of the placebo. Retrieved 2010-07-22
- Biological, clinical, and ethical advances of placebo effects (http://www.thelancet.com/journals/lancet/article/PIIS0140-6736(09)61706-2/abstract) The Lancet (2010)

List of cognitive biases

A cognitive bias is a pattern of poor judgment, often triggered by a particular situation. Identifying "poor judgment," or more precisely, a "deviation in judgment," requires a standard for comparison, i.e. "good judgment". In scientific investigations of cognitive bias, the source of "good judgment" is that of people outside the situation hypothesized to cause the poor judgment, or, if possible, a set of independently verifiable facts. The existence of most of the particular cognitive biases listed below has been verified empirically in psychology experiments.

Cognitive biases, like many behaviors are influenced by evolution and natural selection pressure. Some are presumably adaptive and beneficial, for example, because they lead to more effective actions in given contexts or enable faster decisions, when faster decisions are of greater value for reproductive success and survival. Others presumably result from a lack of appropriate mental mechanisms, i.e. a general fault in human brain structure, or from the misapplication of a mechanism that is adaptive (beneficial) under different circumstances.

Cognitive bias is a general term that is used to describe many distortions in the human mind that are difficult to eliminate and that lead to perceptual distortion, inaccurate judgment, or illogical interpretation.[1]

Decision-making and behavioral biases

Many of these biases are studied for how they affect belief formation, business decisions, and scientific research.

- **Anchoring –** the common human tendency to rely too heavily, or "anchor," on one trait or piece of information when making decisions.
- **Attentional Bias –** implicit cognitive bias defined as the tendency of emotionally dominant stimuli in one's environment to preferentially draw and hold attention.
- **Backfire effect** - Evidence disconfirming our beliefs only strengthens them.
- **Bandwagon effect –** the tendency to do (or believe) things because many other people do (or believe) the same. Related to groupthink and herd behavior.
- **Bias blind spot –** the tendency to see oneself as less biased than other people.[2]
- **Choice-supportive bias –** the tendency to remember one's choices as better than they actually were.[3]
- **Confirmation bias –** the tendency to search for or interpret information in a way that confirms one's preconceptions.[4]
- **Congruence bias –** the tendency to test hypotheses exclusively through direct testing, in contrast to tests of possible alternative hypotheses.
- **Contrast effect –** the enhancement or diminishing of a weight or other measurement when compared with a recently observed contrasting object.[5]
- **Denomination effect –** the tendency to spend more money when it is denominated in small amounts (e.g. coins) rather than large amounts (e.g. bills).[6]
- **Distinction bias –** the tendency to view two options as more dissimilar when evaluating them simultaneously than when evaluating them separately.[7]
- **Endowment effect –** "the fact that people often demand much more to give up an object than they would be willing to pay to acquire it".[8]
- **Experimenter's or Expectation bias –** the tendency for experimenters to believe, certify, and publish data that agree with their expectations for the outcome of an experiment, and to disbelieve, discard, or downgrade the corresponding weightings for data that appear to conflict with those expectations.[9]
- **Focusing effect –** the tendency to place too much importance on one aspect of an event; causes error in accurately predicting the utility of a future outcome.[10]
- **Framing effect –** drawing different conclusions from the same information, depending on how that information is presented.
- **Hostile media effect** - the tendency to see a media report as being biased due to one's own strong partisan views.

- **Hyperbolic discounting** – the tendency for people to have a stronger preference for more immediate payoffs relative to later payoffs, where the tendency increases the closer to the present both payoffs are.[11]
- **Illusion of control** – the tendency to overestimate one's degree of influence over other external events.[12]
- **Impact bias** – the tendency to overestimate the length or the intensity of the impact of future feeling states.[13]
- **Information bias** – the tendency to seek information even when it cannot affect action.[14]
- **Irrational escalation** – the phenomenon where people justify increased investment in a decision, based on the cumulative prior investment, despite new evidence suggesting that the decision was probably wrong.
- **Loss aversion** – "the disutility of giving up an object is greater than the utility associated with acquiring it".[15] (see also Sunk cost effects and Endowment effect).
- **Mere exposure effect** – the tendency to express undue liking for things merely because of familiarity with them.[16]
- **Money illusion** – the tendency to concentrate on the nominal (face value) of money rather than its value in terms of purchasing power.[17]
- **Moral credential effect** – the tendency of a track record of non-prejudice to increase subsequent prejudice.
- **Negativity bias** – the tendency to pay more attention and give more weight to negative than positive experiences or other kinds of information.
- **Neglect of probability** – the tendency to completely disregard probability when making a decision under uncertainty.[18]
- **Normalcy bias** – the refusal to plan for, or react to, a disaster which has never happened before.
- **Omission bias** – the tendency to judge harmful actions as worse, or less moral, than equally harmful omissions (inactions).[19]
- **Outcome bias** – the tendency to judge a decision by its eventual outcome instead of based on the quality of the decision at the time it was made.
- **Planning fallacy** – the tendency to underestimate task-completion times.[13]
- **Post-purchase rationalization** – the tendency to persuade oneself through rational argument that a purchase was a good value.
- **Pseudocertainty effect** – the tendency to make risk-averse choices if the expected outcome is positive, but make risk-seeking choices to avoid negative outcomes.[20]
- **Reactance** – the urge to do the opposite of what someone wants you to do out of a need to resist a perceived attempt to constrain your freedom of choice.
- **Restraint bias** – the tendency to overestimate one's ability to show restraint in the face of temptation.
- **Selective perception** – the tendency for expectations to affect perception.
- **Semmelweis reflex** – the tendency to reject new evidence that contradicts an established paradigm.[21]
- **Social comparison bias** – the tendency, when making hiring decisions, to favour potential candidates who don't compete with one's own particular strengths.[22]
- **Status quo bias** – the tendency to like things to stay relatively the same (see also loss aversion, endowment effect, and system justification).[23] [24]
- **Unit bias** — the tendency to want to finish a given unit of a task or an item. Strong effects on the consumption of food in particular.[25]
- **Wishful thinking** – the formation of beliefs and the making of decisions according to what is pleasing to imagine instead of by appeal to evidence or rationality.[26]
- **Zero-risk bias** – preference for reducing a small risk to zero over a greater reduction in a larger risk.

Biases in probability and belief

Many of these biases are often studied for how they affect business and economic decisions and how they affect experimental research.

- **Ambiguity effect –** the tendency to avoid options for which missing information makes the probability seem "unknown."[27]
- **Anchoring effect –** the tendency to rely too heavily, or "anchor," on a past reference or on one trait or piece of information when making decisions (also called "insufficient adjustment").
- **Attentional bias –** the tendency to neglect relevant data when making judgments of a correlation or association.
- **Availability heuristic –** estimating what is more likely by what is more available in memory, which is biased toward vivid, unusual, or emotionally charged examples.
- **Availability cascade –** a self-reinforcing process in which a collective belief gains more and more plausibility through its increasing repetition in public discourse (or "repeat something long enough and it will become true").
- **Base rate neglect *or* Base rate fallacy –** the tendency to base judgments on specifics, ignoring general statistical information.[28]
- **Belief bias –** an effect where someone's evaluation of the logical strength of an argument is biased by the believability of the conclusion.[29]
- **Clustering illusion –** the tendency to see patterns where actually none exist.
- **Conjunction fallacy –** the tendency to assume that specific conditions are more probable than general ones.[30]
- **Forward Bias** - the tendency to create models based on past data which are validated only against that past data.
- **Gambler's fallacy –** the tendency to think that future probabilities are altered by past events, when in reality they are unchanged. Results from an erroneous conceptualization of the Law of large numbers. For example, "I've flipped heads with this coin five times consecutively, so the chance of tails coming out on the sixth flip is much greater than heads."
- **Hindsight bias –** sometimes called the "I-knew-it-all-along" effect, the tendency to see past events as being predictable[31] at the time those events happened.(sometimes phrased as "Hindsight is 20/20")
- **Illusory correlation –** inaccurately perceiving a relationship between two events, either because of prejudice or selective processing of information.[32]
- **Observer-expectancy effect –** when a researcher expects a given result and therefore unconsciously manipulates an experiment or misinterprets data in order to find it (see also subject-expectancy effect).
- **Optimism bias –** the tendency to be over-optimistic about the outcome of planned actions.[33]
- **Ostrich effect –** ignoring an obvious (negative) situation.
- **Overconfidence effect –** excessive confidence in one's own answers to questions. For example, for certain types of questions, answers that people rate as "99% certain" turn out to be wrong 40% of the time.[34] [35]
- **Positive outcome bias –** the tendency of one to overestimate the probability of a favorable outcome coming to pass in a given situation (see also wishful thinking, optimism bias, and valence effect).
- **Pareidolia –** a vague and random stimulus (often an image or sound) is perceived as significant, e.g., seeing images of animals or faces in clouds, the man in the moon, and hearing hidden messages on records played in reverse.
- **Pessimism bias –** the tendency for some people, especially those suffering from depression, to overestimate the likelihood of negative things happening to them.
- **Primacy effect –** the tendency to weigh initial events more than subsequent events.[36]
- **Recency effect –** the tendency to weigh recent events more than earlier events (see also peak-end rule).
- **Disregard of regression toward the mean –** the tendency to expect extreme performance to continue.
- **Stereotyping –** expecting a member of a group to have certain characteristics without having actual information about that individual.
- **Subadditivity effect –** the tendency to judge probability of the whole to be less than the probabilities of the parts.

- **Subjective validation** – perception that something is true if a subject's belief demands it to be true. Also assigns perceived connections between coincidences.
- **Well travelled road effect** – underestimation of the duration taken to traverse oft-traveled routes and over-estimate the duration taken to traverse less familiar routes.

Social biases

Most of these biases are labeled as attributional biases.

- **Actor–observer bias** – the tendency for explanations of other individuals' behaviors to overemphasize the influence of their personality and underemphasize the influence of their situation (see also Fundamental attribution error), and for explanations of one's own behaviors to do the opposite (that is, to overemphasize the influence of our situation and underemphasize the influence of our own personality).
- **Dunning–Kruger effect** – a twofold bias. On one hand the lack of metacognitive ability deludes people, who overrate their capabilities. On the other hand, skilled people underrate their abilities, as they assume the others have a similar understanding.[37]
- **Egocentric bias** – occurs when people claim more responsibility for themselves for the results of a joint action than an outside observer would.
- **Forer effect** (aka Barnum effect) – the tendency to give high accuracy ratings to descriptions of their personality that supposedly are tailored specifically for them, but are in fact vague and general enough to apply to a wide range of people. For example, horoscopes.
- **False consensus effect** – the tendency for people to overestimate the degree to which others agree with them.[38]
- **Fundamental attribution error** – the tendency for people to over-emphasize personality-based explanations for behaviors observed in others while under-emphasizing the role and power of situational influences on the same behavior (see also actor-observer bias, group attribution error, positivity effect, and negativity effect).[39]
- **Halo effect** – the tendency for a person's positive or negative traits to "spill over" from one area of their personality to another in others' perceptions of them (see also physical attractiveness stereotype).[40]
- **Illusion of asymmetric insight** – people perceive their knowledge of their peers to surpass their peers' knowledge of them.[41]
- **Illusion of transparency** – people overestimate others' ability to know them, and they also overestimate their ability to know others.
- **Illusory superiority** – overestimating one's desirable qualities, and underestimating undesirable qualities, relative to other people. (Also known as "Lake Wobegon effect," "better-than-average effect," or "superiority bias").[42]
- **Ingroup bias** – the tendency for people to give preferential treatment to others they perceive to be members of their own groups.
- **Just-world phenomenon** – the tendency for people to believe that the world is just and therefore people "get what they deserve."
- **Moral luck** – the tendency for people to ascribe greater or lesser moral standing based on the outcome of an event rather than the intention
- **Outgroup homogeneity bias** – individuals see members of their own group as being relatively more varied than members of other groups.[43]
- **Projection bias** – the tendency to unconsciously assume that others (or one's future selves) share one's current emotional states, thoughts and values.[44]
- **Self-serving bias** – the tendency to claim more responsibility for successes than failures. It may also manifest itself as a tendency for people to evaluate ambiguous information in a way beneficial to their interests (see also group-serving bias).[45]
- **System justification** – the tendency to defend and bolster the status quo. Existing social, economic, and political arrangements tend to be preferred, and alternatives disparaged sometimes even at the expense of individual and collective self-interest. (See also status quo bias.)

- **Trait ascription bias –** the tendency for people to view themselves as relatively variable in terms of personality, behavior and mood while viewing others as much more predictable.
- **Ultimate attribution error –** similar to the fundamental attribution error, in this error a person is likely to make an internal attribution to an entire group instead of the individuals within the group.

Memory errors and biases

Further information: Memory bias

- **Cryptomnesia –** a form of *misattribution* where a memory is mistaken for imagination.
- **Egocentric bias –** recalling the past in a self-serving manner, e.g. remembering one's exam grades as being better than they were, or remembering a caught fish as being bigger than it was.
- **False memory –** confusion of imagination with memory, or the confusion of true memories with false memories.
- **Hindsight bias –** filtering memory of past events through present knowledge, so that those events look more predictable than they actually were; also known as the "I-knew-it-all-along effect."[31]
- **Positivity effect –** older adults remember relatively more positive than negative things, compared with younger adults[46]
- **Reminiscence bump –** the effect that people tend to recall more personal events from adolescence and early adulthood than from other lifetime periods.
- **Rosy retrospection –** the tendency to rate past events more positively than they had actually rated them when the event occurred.
- **Self-serving bias –** perceiving oneself responsible for desirable outcomes but not responsible for undesirable ones.
- **Suggestibility –** a form of *misattribution* where ideas suggested by a questioner are mistaken for memory.
- **Telescoping effect –** the effect that recent events appear to have occurred more remotely and remote events appear to have occurred more recently.
- **Von Restorff effect –** the tendency for an item that "stands out like a sore thumb" to be more likely to be remembered than other items.

Common theoretical causes of some cognitive biases

- **Bounded rationality –** limits on optimization and rationality
- **Attribute substitution –** making a complex, difficult judgment by unconsciously substituting an easier judgment[47]
- **Attribution theory**, especially:
  - **Salience**
- **Cognitive dissonance**, and related:
  - **Impression management**
  - **Self-perception theory**
- **Heuristics**, including:
  - **Availability heuristic –** estimating what is more likely by what is more available in memory, which is biased toward vivid, unusual, or emotionally charged examples[32]
  - **Representativeness heuristic –** judging probabilities on the basis of resemblance[32]
  - **Affect heuristic –** basing a decision on an emotional reaction rather than a calculation of risks and benefits[48]
- **Introspection illusion**
- **Adaptive bias**
- Misinterpretations or **misuse of statistics**.

Methods for dealing with cognitive biases

Reference class forecasting was developed by Daniel Kahneman, Amos Tversky, and Bent Flyvbjerg to eliminate or reduce the impact of cognitive biases on decision making.[49]

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