The Journal of Mind and Behavior
Winter 2020, Volume 41, Number 1
Pages 1–14
ISSN 0271–0137

Belief: The Explanatory Power of Hume's Theory

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Hume's feeling theory of belief is brought up to date through the later contributions of Russell, Peirce, Darwinian evolution, and the two-systems model of thinking. Belief is shown to take its place in System 1. The theory can explain the existence, mechanisms, and adaptive functions of belief in animals. In humans belief keeps its original nature and function, as evolved adaptations typically do. For this reason humans, when forming beliefs, rely too much on statistically unwarranted induction, and use logic and judgment of probability poorly and too little. The feeling theory fits with naturalistic decision theory, and gives persuasive mechanisms for availability and confirmation biases, and for the usual overconfidence in our beliefs. It offers suggestions for the prevalence of wishful believing, and the potent effects of repetition and of cognitive fluency on belief. Ironically, it shows why cognitive theories of belief are intuitive.

Keywords: belief, feeling theory of belief

There has been a revolution in psychology as the dual-process or two systems model of thinking has reached maturity (Kahneman, 2011). In this model System 1 or Type 1 thinking is automatic, fast, and effortless. Its operations are unconscious, though the products it generates often reach consciousness as memories, beliefs, desires, emotions, and actions. It governs automatic attention. It stores and retrieves memories, controls learned motor skills, interprets perceptions, and is involved with emotions, familiarity, and surprise. It seeks causes for events, responds quickly, and is prone to error. It uses induction effortlessly and quickly. System 2 is deliberate, slow, effortful, and only intermittently active. It uses deliberate attention and its operations are largely conscious. It can be taught deduction, can learn to be abstract and logical, and can use thought experiments. It provides the best guide to truth (Kahneman, 2011; Newstead and Evans, 1995). I believe our ideas about belief have not yet been adequately brought in line with the dual-process model of thinking. This paper attempts to do this.

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There have been four main theories about the nature of belief: Hume's feeling theory, which I have supported; Locke's cognitive theory and its variants; the theory that beliefs are behavioral dispositions; and eliminativist theories that belief does not exist but is an artifact of our language and culture (Leicester, 2008). I will begin with the feeling theory, and will concentrate mainly on demonstrating its explanatory power.

Hume's Feeling Theory of Belief

Hume gave this definition of belief: "An idea assented to feels different from a fictitious idea … tis impossible to explain perfectly this feeling … but its name is belief" (Hume, 1739/1969, Book 1 section 7, p. 146). The theory is counterintuitive for those of us who have not been aware of having a feeling they are prepared to call belief (Leicester, 2008). It is not surprising that Hume found it impossible to describe the feeling perfectly, since no feeling can be described adequately in words. Incautiously, Hume did go on to try to describe the feeling or the effect the feeling had on the believed item, which for him became firmer, steadier, more forceful, and more vivacious (p. 146). Unfortunately these metaphors have missed their mark, and caused some problems and misunderstandings about his theory that have been well reviewed by Michael Gorman (1993). As Bertrand Russell makes clear, in all cases of believing the feeling is the same, only the believed contents are different, and the feeling is somehow attached to the item believed: "A man is believing at a given moment … the contents of his mind at that moment" (1921, pp. 232–234, 250). Belief is a weak feeling, often hardly noticeable, though it varies in strength. When it is strong, the believer, rather than saying he believes the item strongly, might prefer to say he feels certain or convinced of its truth. He might say that he knows it ("knows it" in this personal sense means "believes it strongly" and is far from infallible [Fischhoff, Slovic, and Lichtenstein, 1977]). Belief is a signal to the person that he believes the item being considered. Disbelief is a different feeling, it is a signal to the person that he disbelieves the item. As Charles Peirce pointed out "We generally know when we wish to ask a question and when we wish to pronounce a judgment, for there is a dissimilarity between the sensation of doubting and that of believing" (1877/1957, p. 10). Disbelief is a weak feeling, but variable in strength and often slightly more noticeable than belief. Belief and disbelief are specific feelings, though strong beliefs sometimes cause other feelings and emotions. Many beliefs are long-lasting: they have become memories, and like other memories are stored and recalled by cues (Leicester, 2008). Belief is not restricted to consideration of propositions. All our perceptions and feelings are monitored by belief/disbelief. This is usually an unnoticed assent. Evidence that it occurs comes from unexpected or ambiguous perceptions, which arouse disbelief or doubt that is noticed and often prompts inquiry. Russell commented "Beliefs of this class are what are called 'judgments of perception.'

… Such beliefs display themselves when the expectations they arouse fail in any way" (1921, pp. 237, 242). As Peirce realized, belief and disbelief have valence; believing is slightly pleasant and disbelieving is slightly aversive. He wrote "Doubt is an uneasy and dissatisfied state from which we struggle to free ourselves and pass into a state of belief, while the latter is a calm and satisfactory state which we do not wish to avoid" (1877/1957, p. 11). This observation demonstrates how belief and doubt are linked to the laws of behaviorism and are thus equipped to be a guide to practical action.

These observations on the nature of belief now have support from functional MRI brain scans. Harris, Sheth, and Cohen (2008) had subjects, working at their own speed, press one of three buttons to indicate if they believed, disbelieved, or were unsure about each statement presented. As subjects actively believed an item, brain regions having strong connections with the limbic system showed increased activity. The pattern of brain activation was the same whether the believing concerned autobiographical, mathematical, geographical, religious, ethical, semantic, or factual items. Activation during disbelief was different and included areas known to be concerned with feelings of negative valence. The average time to button press was 3.26 seconds for true items, 3.70 seconds for false items, and 3.66 seconds for items subjects were unsure about. These times include a component of reaction time from decision to button press. The authors commented that the results suggested that beliefs might be more related to feelings than to cognition.

Introspection reveals the following properties of belief. Belief often comes quickly and without effort. Belief is not voluntary; we cannot decide by will what we believe, we cannot control when we will experience belief, and we find it difficult or impossible to suspend belief. Belief is ready to occur all the waking hours and during dreaming (when disbelief is inactive). These observations indicate that belief belongs to System 1 in the dual-process model of the mind. Even the beliefs from System 1 that come during deliberate inquiry into a problem by System 2 are effortless. The simple disbelief of an item that can be immediately negated is also quick, effortless, involuntary, and ever-ready. Doubt, the term used by Peirce, is more complex. It can be used to mean mild simple disbelief, or to mean a more complex state of vacillation, ambiguity, and indecision. Peirce used the term in both senses. Kahneman reports that doubt in its more complex sense belongs to System 2, and that considering ambiguity and sustaining doubt and indecision involves effort (Kahneman, 2011, p. 114).

System 1 is the system that is old in evolution and that humans share with other vertebrates. This infers that these animals have the beliefs they seem to have, as dog-owners have always believed, but as some researchers, because of having uncertainty about consciousness in animals, or from holding a cognitive theory of belief, have doubted. Non-human animals form their beliefs using the mental resources they have. They use perception, memory, and association memory

using imagery, and recognition of familiarity or novelty. They make ready use of induction, including statistically unwarranted induction. The beliefs they form are used to guide action, as dog-owners know. When they have to, animals can resort to trials of action, seeking a waterhole, a gap in a fence, or a way through a maze. Animals do not use abstract concepts such as truth. They lack the human abilities to use deduction, informal logic, mental simulation, or examination of evidence (Povinelli, 2000). Survival has often depended on making rapid decisions about action, when waiting for further instances to allow for reliable induction was dangerous, and withholding judgment was inappropriate. Belief evolved to help meet these needs, and has conserved its original nature and function.

In humans, belief still serves the need for quick decision and prompt action, and often operates the way it does in other animals, as beliefs supplied by System 1 guide action directly, without any use of System 2 to inquire into evidence. This involves some sacrifice of accuracy for speed. One problem is that System 1 inevitably holds some mistaken prior beliefs that the believer might use. Another problem is that System 1 still uses inductions made from few prior experiences. Statistically unjustified inductions are a common cause of unwarranted assumptions and mistaken beliefs. In my field of medicine, patients often assume their natural recovery was due to their treatment. In some situations humans still solve problems by trial and error, which is a simple and evolutionarily old form of inquiry (Leicester, 2012). Shoes are tried on before being bought, and jigsaws are solved.

The primary purpose of belief is not to indicate truth. This is a subtle issue because it is easy to be drawn back to the idea of indicating truth by two traps. The first is that something you believe also feels or seems true, and if you later find it no longer feels true you stop believing it. I believe this is because the feeling of truth and the feeling of belief are the same feeling. Do I believe *p*? Is *p* true? The immediate answer to each question is the same feeling of belief or truth and comes before the verbal answer "yes" (which is a quick response to the even quicker feeling). The second trap is that what you believe often is true (as is appropriate for a guide to effective action).

The Role of Doubt and Belief in Inquiry

Humans have evolved methods of inquiry that use System 2. Belief and doubt have controlling roles in this, giving speed and economy to the process. Peirce wrote: "The irritation of doubt causes a struggle to obtain a state of belief. I shall term this struggle *Inquiry.* … As soon as a firm belief is reached we are entirely satisfied, whether the belief be true or false" (1877/1957, pp. 12–13). In terms of the dual-process model of thinking, the process of inquiry begins with a signal of doubt from System 1 to indicate that the situation needs System 2. A wide range of situations can cause this signal, all of which can in a broad sense be called problems, and all of which have negative valence, some disbelief or doubt, some

possibility of failure, that may be the aversive signal to start inquiry that Peirce proposed. Latent problems are not always obvious. If nothing aversive is felt then inquiry will not start.

The next step is to bring to conscious mind a possible response for testing by mental simulation. This is a key step. It comes from System 1 and is unconscious, involuntary, and fallible. It depends on cues and association of ideas, which gives importance to how the problem is framed and to whether a particular response has been primed. Normal and routine acts and events are liable to be activated, as are recent newsworthy events, as well as the inquirer's prior beliefs and prejudices. The stronger the cues the more likely the activation (crossword puzzles depend on this for their effect). The inquirer has no control over which potential alternative emerged and he may be unaware of the cues that led to its emergence (Maier, 1931). The first potential alternative to emerge is the most salient or available factor.

The next step is to test the counterfactual possibility *p* that has emerged, the inquirer using mental simulation to hypothetically add *p* to her stock of knowledge and evaluating her belief in the satisfactory or target outcome *q*, given *p*. When the belief "if *p* then *q*" is strong it is normally decisive, inquiry automatically stops, and, if appropriate, *p* is adopted. In special situations this response can be voluntarily deferred while the situation is checked by further inquiry, as when a critical move is double-checked in a game of chess. When "if *p* then *q*" is either believed weakly or disbelieved, inquiry is likely to continue, with the raising and testing of another possible response. The inquiry will stop automatically with the belief that a satisfactory response is found or cannot be found. It is the belief that counts, not what is true. One reason that inquiry by conditional reasoning sometimes fails is that humans are simply poor at the unconscious process of raising counterfactual alternatives for testing (Leicester, 2012). Why doesn't the crossword answer, known perfectly well, not emerge until the added cues of some of its letters are known?

The inquirer forms her beliefs and bases her decisions on information to hand, relying on evidence from her knowledge and her own prior beliefs, or she might take the advice of a companion. She is insensitive to the adequacy of this evidence. In Kahneman's expression, she acts as though "what you see is all there is" (2011, pp. 85–88). I believe this failing is a natural consequence of belief having retained its old evolved function of guiding quick actions without being "paralysed" by indecision and the lack of good evidence.

The most salient factor is often the best response, but it is not always so, and it exerts an unduly strong influence on the inquiry (Tversky and Kahneman, 1973). I believe this bias is a natural consequence of the nature of belief, acting in one of two ways. First, belief will stop inquiry prematurely when the most salient response is mistakenly strongly believed, and second, when it is believed weakly it will influence later stages of the inquiry by acting as a prior belief.

This explanation for the bias caused by availability is supported by a recent report of what happens as doctors do diagnostic consultations. Olga Kostopolou and her coworkers had each of ninety general practitioners carry out simulated consultations on six supposed patients, three of whom were aged over sixty and had a leading symptom that might or might not have been due to cancer (cough for six weeks, constipation for one month, or back pain for over two months) and three had other symptoms and different ages. Participants were encouraged to "think aloud" as they did the consultations. The doctors' first impressions were typically voiced very early in the consultation and often suggested a possible diagnosis. This suggestion affected the rest of the consultation, when subsequent questions and requested investigations showed a bias to confirm the prior belief that was estimated to contribute thirty percent of the undue influence of the first impression. The final opinion "possible cancer" was made in 67 of 108 instances when this was the initial impression, and 27 of 104 instances where the first impression was another diagnosis. The study is in accord with my own long experience of diagnostic work (Kostopolou, Sirota, Round, Samaranayaka, and Delaney, 2017).

There is another confirmation bias that is often present during inquiry that leads people to find more support for their prior beliefs than is warranted. For example, one experiment exposed participants to two purported studies, one confirming the deterrent effect of the death penalty and the other denying it. Proponents and opponents of capital punishment both found the experience supported and strengthened their prior beliefs (Lord, Ross, and Lepper, 1979). I believe this bias is a natural consequence of Peirce's law that doubt starts inquiry and belief stops it, leading inquirers to accept at face value aspects they agree with while subjecting to critical scrutiny aspects they doubt.

Doubt and belief give speed and economy to inquiry in several ways. Through the mechanisms of automatic attention, belief and doubt tend to be restricted to pertinent matters that might require actions. Robert Audi reports that on irrelevant aspects of a situation there is often no more than a readiness to form a belief. His example is that he does not form the belief that the paragraph he is reading has more than thirty-three words (Audi, 2015, pp. 15–16, 48). The length of a paragraph is only pertinent for a person writing or editing a piece to be of prescribed length. Coming into a familiar room in which nothing is out of place or missing is another example of this common phenomenon. Belief that a solution is found or cannot be found terminates inquiry, freeing the mind to move on to the next matter. Human curiosity can trigger inquiry into doubtful matters that will not require a personal response, and there is pleasure forming a belief about them. What will the government do? Is the dark thing on the distant snowfield a rock or a skier?

This is the method of inquiry that Frank Ramsey described (Ramsey, 1929/1990). It is consistent with more recent models of naturalistic decision making (Klein, Orasanu, Calderwood, and Zsambok, 1992). I have emphasized the role that I think belief plays in the process.

Humans living in advanced societies often have the option of taking inquiry the further step of deliberately seeking additional evidence from less readily available sources. This is a practical option for selected important problems. It has only been available in historical times, and until very recently was extremely slow. It is far removed from the evolution, nature, and natural function of belief. It is not surprising to find that we are poor judges of our evidence, are often satisfied with poor evidence, and have undue confidence in our beliefs, acting as though what we know is all there is. Some people are more prepared than others to use this option. People with stronger dislike for careful cognitive analysis, greater faith in their intuition, and less interest in other people's opinions are less likely to take inquiry this extra step before making important decisions (Stanovich, 2009). The search for additional evidence is subject to another confirmation bias, a bias to choose and use sources we expect to support our prior beliefs, and to avoid sources we expect to challenge them (Shermer, 1997). This is clearly shown by the news sources people choose to use. This bias is in large part deliberate, but it also has an unconscious element. It probably relates to the fact that repeated exposure to beliefs different from our own is aversive and disturbs cognitive ease.

Subjects' Failure to Have Evidence for Their Beliefs

Deanna Kuhn (1991, p. 89) showed how frequently people are satisfied with inadequate evidence. Working with the complex problems of the most important reasons why some children do poorly at school, why many prisoners reoffend after leaving jail, and why some people are unable to find and keep steady employment, she and her team found most individuals readily reported their opinions, often nominated a single most important reason, and were often confident of their correctness. When asked why they held their beliefs, participants could offer no genuine evidence for their opinions in over half the instances. Their answers often amounted to an elaborated restatement of their belief, or were based on unwarranted inductions from a small number of instances, sometimes a single personal experience.

In most situations most people are overconfident in the correctness of their beliefs (Lichtenstein, Fischoff, and Phillips, 1982). In a general knowledge test, one quarter of their answers that college students felt certain were correct were wrong, yet the students were uncritical of their answers (Fischhoff, Slovic, and Lichtenstein, 1977). Watching medical students interpret x-rays, the educational theorist Abercrombie wrote "The inferences the students made were not arrived at as a result of a series of logical steps, but swiftly and almost unconsciously. The validity of the inferences was usually not inquired into, indeed the process was usually accompanied by a feeling of certainty of being right" (1960, p. 89). I believe this is because belief inhibits the impulse to inquiry and a feeling of certainty brings inquiry to a stop, to the detriment of accuracy. There are some exceptions to this

overconfidence rule. People do not show overconfidence about very simple issues and questions, when they correctly judge that the accuracy of their beliefs is high, and it is not seen in a few special situations involving trained experts in fields that automatically provide good feedback (Lichtenstein, Fischhoff, and Phillips, 1982).

Belief and Limited Human Ability for Abstract Concepts

Humans use simple logic, abstract concepts, and statistical probability all rather poorly. These things have to be taught and are easily neglected, even by trained people when they are off their guard. Alexander Luria showed that many unschooled people living in isolated communities cannot use deduction. When attempting to answer syllogisms, they had to rely on what they knew. In a typical example, a man was told "Cotton can grow only where it is hot and dry. England is cold and damp." He was then asked "Can cotton grow there?" He answered "I don't know." Given further hints and helpful questions the best he could manage was "I've only been in Kashgar County, I don't know beyond that" (Luria, 1974/1976, pp. 102–106). On slightly more difficult logical problems even educated people do poorly. There is no better example than Wason's four-card selection task, the problem that played a large part in the first proposal of the dual-process model of thinking (Wason and Evans, 1975). In this task participants are instructed "Every card has a letter on one side and a number on its other side. The rule is that if a card has a consonant on one side it has an even number on its other side. Which cards must be turned over to know if the rule is being obeyed?" The subjects are then shown a row of four cards, for example T, e, 4, 7. Most subjects new to the test and not warned to expect a trap select either T or T and 4. The task is unfamiliar and abstract. When the problem is set in a concrete and familiar form subjects do much better (though familiarity could make them less careful). For example: "The law is that alcohol can only be served to people aged 18 or older. The bar has four customers, one aged 16, one aged 53, one drinking coke, and one drinking beer. Which customers must the inspector check to know that the law is being obeyed?" People also estimate and use probability poorly (Gettys, Kelly, and Patterson, 1973). These limitations might be because humans evolved to deal with particular incidents, not abstract considerations, which are a recent human achievement, not an evolutionary adaptation.

Wishful Believing

There is a strong tendency to believe what we wish was true, which I speculate is adaptive: that the sacrifice of truth that wishful believing causes is in some situations worth the price. There is more than one mechanism for wishful believing. Rationalization, projection, hindsight bias, the bias to believe our own part in remembered events was larger and more praiseworthy than it was, and the bias to

take credit and shed blame serve to maintain a degree of self-esteem, something that is necessary for efficient functioning. This explanation does not explain most instances of wishful believing. Belief, fear, and cognitive assessment can have a restraining influence on desire, and perhaps it is best if that restraint is not too strong. Certainly the rewards for attempting something dangerous or difficult are sometimes great, and too much prudence can hold people back. Alternatively, perhaps because pleasant beliefs are attractive and inconvenient truths are aversive, wishful believing is a price paid for behaviorism's old laws.

Repetition and Belief

Repetition has the unfortunate ability to generate belief (Dechêne, Stahl, Hansen, and Wänke, 2010). The effect begins with only one or two repetitions for plausible statements about which the subject is uncertain or ignorant. Persistent repetitions can sometimes change justified disbelief to belief. Repetition is used by manipulators of our beliefs, by advertising, by propaganda, and, of most concern, by election campaigns. It is most effective with arresting posters and catchy slogans (Coke Adds Life; Get Brexit Done). Unlike a reasoned argument, these brief messages are weak invitations to analysis and are easy to remember. Slogans can even be chanted in chorus by supporters at political rallies and protest demonstrations, often in front of television crews. The more frequent the repetition the stronger the effect. People sometimes indoctrinate themselves with repeated assertions. The cyclist Tyler Hamilton said of his part in cycling's doping scandals "Sometimes if you lie enough you start to believe it" (Hamilton and Coyle, 2012, p. 23).

Why does repetition work? Why, if we disbelieve a proposition on first contact, do we not doubt it more strongly on hearing it repeatedly, but often begin to believe it? Part of the reason is because of our natural credulity — our innate tendency to believe rather than disbelieve (Bain, 1888; Gilbert, 1991). This credulity is presumed to be essential for infants to make a start in life, and the tendency towards credulity continues into adult life. Adults believe as they watch plays and read novels. People believe testimony unless they have a reason to doubt it. Natural credulity might be why simple disbelief takes a fraction longer than simple belief to register (Harris, Sheth, and Cohen, 2008), and why only belief occurs in dreams. I believe that the habituation of disbelief contributes to the effect of repetition, that disbelief is one of those feelings that, like horror, gradually loses its force with repetition, leaving natural credulity to gradually assert itself. I have experienced this dual effect of persistently repeated repetition myself, in an episode described in my earlier article (Leicester, 2008).

The generation of belief by repetition arises in System 1. During the early stages of its development the incipient belief will be dispelled at least temporarily if the believer chooses to recruit System 2 to the issue. Hamlet has not killed Polonius,

two actors are on a stage playing roles. I should ignore the slogan, and consider the issues at stake over Brexit.

Belief and Cognitive Fluency

The account of belief given above offers a perspective on the new field of cognitive fluency. Cognitive fluency refers to the user's subjective experience of how difficult or easy it will be to perform a proposed mental task (Alter and Oppenheimer, 2009; Newman and Zhang, 2020). It is the feeling the user associates with the prospect of undertaking the task, and is not always related to how hard the task really is. High fluency equates with perceived cognitive ease and has positive valence. A person happy with her situation and unworried is in a state of cognitive ease. She tends not to activate System 2 and is prone to careless assumptions. Low fluency refers to perceived cognitive strain and has negative valence. It alerts the user, recruits her System 2, and makes her more careful with her response and less likely to make careless errors. There is a bias to disbelieve statements which have low cognitive fluency, and to believe statements with high cognitive fluency.

Peirce wrote "Doubt is an uneasy and dissatisfied state from which we struggle to free ourselves and pass into a state of belief, while the latter is a calm and satisfactory state which we do not wish to avoid" (1877/1957, p. 11). The parallels are clear, though Peirce is more explicit about what he believes causes cognitive stress. Psychologists who work on cognitive fluency do write of feelings of truth, but emphasize feelings of familiarity and the exposure effect as an important cause of cognitive ease. I have been unsure about the relationships between belief and familiarity, except that they are close. "Perceived cognitive ease" is a belief. The unconscious exposure effect begins with a preference (Zajonc, 1980), and the belief that something seems better in some way underlies the preference for it. Dejà vu and jamais vu are disconcerting experiences that occur when belief and familiarity become uncoupled, when what you believe should feel unfamiliar feels familiar, and what you believe should feel familiar feels unfamiliar. They occur commonly in patients with temporal lobe epilepsy and occasionally in most other people. Cognitive ease, of course, is not present only when a problem has just been solved. It is the usual state for people in good mental health and even only moderately satisfactory situations, as assent is the usual state on the belief/disbelief dimension.

Other Theories of Belief

Locke's Cognitive or Intellectualistic Theory of Belief

Locke lay the basis for the cognitive theory of belief when he wrote "Belief is the admitting or receiving any proposition for true, upon arguments or proofs

that are found to persuade us to receive it as true" (Locke, 1690/1976, Book 4, Chapter 15, p. 356). This is an operational definition that does not say what belief is. The usual answer is that belief is an attitude to a proposition, different from other attitudes to a proposition, for example, disbelief, desire, or anger. To me, this seems to imply something subjective about experiencing belief. The cognitive theory holds that the primary purpose of belief is to indicate truth, and implies that it is only through truth that belief can guide action. The theory is intuitive. I believe this is in large part because the things you believe feel true, and if one of them stops feeling true then you stop believing it.

The cognitive theory always had the problem that some people hold beliefs that are manifestly false. Locke knew that on some issues the beliefs of experts were based on judgments of probability that might be wrong (p. 356). He accepted that the limits of time and education made it necessary to accept some beliefs on the authority of others and argued that their testimony was evidence for those beliefs. He believed that misjudging the reliability of testimony was the most frequent cause of false beliefs (p. 357). He commented on people who were unwilling to change a belief when shown evidence that it was false, which he attributed to a personality trait, obstinacy (Book 2, Chapter 33, p. 198). He knew that reason could make no contribution to some issues, which he believed were settled by a different process of revelation and faith (Book 4, Chapter 18, p. 378). Other writers of the time had shown that wishful believing occurred and that emotions could affect beliefs, but Locke seems to keep these apart from cognition and to underestimate their importance.

None of these old problems has been resolved, while advances in psychology provide new insights into belief that don't help the cognitive theory. The need to be cautious about relying on intuition is better appreciated now. As discussed above, believers are often satisfied with poor evidence for their beliefs. It is now realized that belief is the easier position and a degree of credulity is natural. The cognitive theory requires belief to belong to System 2, but belief has all the characteristics of belonging to System 1. The fields of cognitive biases and cognitive fluency have discovered many new factors that contribute to the large gap between belief and truth. The cognitive theory itself falls for the availability heuristic, giving undue importance to the most salient determinant of belief, which is evidence, and neglects the many other determinants. Locke's theory is relatively simple and easy to understand, giving it high cognitive fluency, opening another bias towards believing it.

Locke's definition of belief describes how people should believe, which is part of epistemology, but it does not account well for how or why people do believe, which is part of psychology. The definition lacks explanatory power. There is not even consensus about how belief could indicate truth (Chan, 2014).

Epistemology has an important contribution to make, which is that there is a moral dimension to believing (Audi, 2015, pp. 42–46, 258–276). Beginning with

the observation that forming a belief is not a voluntary act of will, Robert Audi nevertheless agrees with those who believe there is an ethical dimension to belief, a way we should believe. Beliefs are not under direct voluntary control, but they can be influenced indirectly, usually by finding and carefully assessing the evidence bearing on them. There is a responsibility to believe truly, especially about important matters, and "for some categories of people" (p. 260). Audi tactfully leaves it to his readers to identify these categories of people. It is also obvious on ethical grounds that beliefs, once formed, should be acknowledged when appropriate, not concealed or denied. When you are not prepared to make the effortful inquiry needed to reach a sound belief you should acknowledge this if your opinion on the matter is sought. It is gracious to be modest about your beliefs concerning matters about which you have no special expertise, in part because sometimes your belief will be false.

Dispositional and Eliminativist Theories of Belief

These are minority opinions, and I will comment on them only briefly. How are we able to tell so easily between believing, disbelieving, and simply considering a statement? With simple statements this three-way discrimination is made in less than four seconds (Harris, Sheth, and Cohen, 2008). The easy answer is to propose that belief and disbelief are signalled by specific feelings. People who are not happy to adopt this explanation have found the question hard to answer satisfactorily. One answer is the dispositional theory of belief, which proposes that beliefs are behavioral dispositions. Wittgenstein wrote "Believing … is a kind of disposition of the believing person. This is shewn me in the case of someone else by his behaviour; and by his words … how do I myself recognize my own disposition? — Here it will have been necessary for me to take notice of myself as others do" (1953, pp. 191–192). This is counterintuitive. The intuitive position is that the beliefs cause the behavioural dispositions. For example, I have put up my umbrella because I believe it is raining, and I believe it is raining because I have seen and felt raindrops. Another answer is to propose that belief does not exist, but is an artifact of our culture. The idea originated in philosophy and appeals to some workers in artificial intelligence. To most people it is counterintuitive. But if there is no more to belief than the conclusion from analysis of evidence, no signal of belief, then in a sense belief does not exist, only analysis of evidence exists. The word "belief" is easy to eliminate. English speakers have many alternatives, the most frequently used being simple assertion and the broader term "think" — Nelson never married; I think it is important. Other alternatives include "judgment" and, for prediction, "expect" — in my judgment she is selfish; I expect we will win. Some simple languages do not have a word for belief (Needham, 1972). I argue that these linguistic facts do not necessarily imply that belief does not exist. Hume's definition says what belief is, and denies eliminativism.

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