

Research Article

Explanations Versus Applications

The Explanatory Power of Valuable Beliefs

Jesse Preston¹ and Nicholas Epley²

¹Harvard University and ²University of Chicago

ABSTRACT—*People hold beliefs that vary not only in their perceived truth, but also in their value to the believer—their meaning, relevance, and importance. We argue that a belief's value is determined, at least in part, by its explanatory power. Highly valuable beliefs are those that can uniquely explain and organize a diverse set of observations. Less valuable beliefs, in contrast, are those that can be explained by other observations, or that explain and organize few observations. The results of three experiments are consistent with these hypotheses. These experiments demonstrate that applying either scientific or religious beliefs to explain other observations increases the perceived value of those beliefs, whereas generating explanations for the existence of beliefs decreases their perceived value. Discussion focuses on the implications of these findings for people's resistance to explaining their own beliefs, for the perceived value of science and religion, and for culture wars between people holding opposing beliefs.*

Beliefs are propositions held to be true, and the average person holds more beliefs than anyone would care to count. But not all of these beliefs are equally valuable. Some—such as belief in God—are vigorously defended when called into question, whereas others—such as the belief that it will rain tomorrow—are not. And some—such as those of Democrats versus Republicans—create intense cultural conflicts between believers, whereas others—such as those of dog lovers versus cat lovers—do not. Valuable beliefs are those that are personally meaningful, relevant, and important to people in their daily lives, and the

research we report here investigates one important mechanism by which beliefs become valuable.

To be sure, beliefs are valued for a variety of reasons: for emotional comfort (Lerner, 1980), self-expression (Prentice, 1987), ego defense (Katz, 1960), and behavior regulation (Greenwald, 1989), among others (Eagly & Chaiken, 1998). Perhaps a belief's most basic instrumental function, however, is to serve as an explanation for one's observations. Belief in free will, for instance, explains one's own and other people's actions (Wegner, 2002). Belief in right-wing conspiracies explains presidential impeachments. And religious beliefs explain the origin of the universe and life after death. Many of the beliefs people possess are in some sense causal explanations that organize their observations and reduce complexity (e.g., life exists because of God), thereby providing expectations for the future (Berlyne, 1960; Gilbert, 1991; Heider, 1958) and reducing the anxiety associated with uncertainty (Ortony, Clore, & Collins, 1988). To the extent that beliefs serve as explanations for one's observations, their value should be a function of their explanatory power.

The idea that beliefs serve as explanations is certainly not new (e.g., Allport, 1935; Frazer, 1890/1923; Thagard, 1989). However, unlike previous functional accounts of belief, our account suggests that it is not simply the perceived truth of a belief that is influenced by its explanatory power, but its perceived value—its meaning, importance, and personal relevance—as well. As people apply a belief to explain more observations, the value of that belief should increase. Applying a belief to other observations positions it as a first cause in a sequence of events, and unites different effects together through a mutual cause. The belief in love as a critical ingredient in romantic relationships, for example, can explain a spouse's steadfast monogamy, lifelong devotion, and tender laughter at one's bad jokes. With each new application, belief in the importance, meaningfulness, and personal relevance of love should increase. We therefore predict that applying a belief to explain one's observations should increase its perceived value.

Address correspondence to Nicholas Epley, University of Chicago, 5807 S. Woodlawn Ave., Chicago, IL 60637, e-mail: epley@chicagosb.edu, or to Jesse Preston, e-mail: jpreston@post.harvard.edu.

Perhaps more important, the flip side of this argument is that explanatory power diminishes if the belief is itself explained by other beliefs. Love for one's spouse, for instance, can be explained by physical attraction, perceived similarity, and the formal commitment that comes with marriage. Now all of the beliefs that could previously be explained by love can be explained by other, more basic, beliefs. Thus, explaining a belief also positions it in a causal sequence, but relegates the focal belief to a secondary or mediating status that may make the focal belief seem less important, meaningful, and relevant (Pennebaker, 1990, 1997; Wilson, Gilbert, & Centerbar, 2003; Wortman, Silver, & Kessler, 1993). We therefore predict that explaining a belief will cause it to lose some of its unique explanatory power, and therefore lose some of its meaning, importance, and relevance as well.

Notice that this example about love refers to the perceived importance of love in a relationship, not to whether or not one is actually loved in one's own relationship, thus demonstrating that the perceived value of a belief can be quite independent of its perceived truth. A person may hold two beliefs to be equally true, but can still value one belief over the other. In addition, both applications of a belief and explanations for a belief can provide evidence consistent with the validity of a belief. Indeed, previous research has found that both explanations and applications of a belief can increase the extent to which that belief is perceived to be a "good" explanation (Read & Marcus-Newhall, 1993). Our predictions about the perceived value of a belief, then, are not dependent on altering the perceived truth or validity of a belief.

We tested our hypotheses in three experiments. In each, participants considered either a novel or an existing belief and were asked to focus on either applications of that belief (i.e., observations that the belief could explain) or explanations for that belief (i.e., observations or underlying causes that could explain the existence of the belief). We predicted that participants asked to apply beliefs would find them to be more valuable—that is, more meaningful, important, and personally relevant—than participants asked to explain beliefs.

STUDY 1: CREATING BELIEFS

Participants in Study 1 were presented with one of two novel scientific beliefs that are familiar to most psychologists but would be considerably less so to the participants: (a) that people prefer similarity in relationship partners or (b) that people with high self-esteem are more likely to be aggressive than people with low self-esteem. Participants in the *applications* condition were then asked to apply their provided belief to other observations (i.e., to think of observations that their belief could explain). Participants in the *explanations* condition, in contrast, were asked to think of observations that could explain the belief (i.e., why people prefer similarity, or why self-esteem might be linked to aggression).

Participants in a control condition neither applied nor explained the provided belief. We expected that participants in the applications condition, compared with those in the control condition, would rate their assigned belief as more valuable—more important, meaningful, and relevant to society—whereas participants in the explanations condition would rate their belief as less valuable than would those in the control condition.

Study 1 also tested our secondary prediction that the perceived value of a belief can vary somewhat independently of its perceived truth. We tested this prediction by asking participants to indicate the likelihood that the target belief was correct.

Method

Interested travelers in a Boston, MA, train station ($N = 171$) received a questionnaire describing one of two beliefs. One group ($n = 73$) read about the widely documented relationship between similarity and attraction (Berscheid & Reis, 1998):

Psychologists have argued that, whether choosing friends or falling in love, we are most attracted to people whose traits are similar to our own. There seems to be wisdom in the old saying, "Birds of a feather flock together." (Myers, 1994, p. 18)

Another group ($n = 98$) read about the documented relationship between self-esteem and aggression (Baumeister, Smart, & Boden, 1996):

Although intuition suggests that people who are depressed or low in self-esteem are more likely to be violent or aggressive towards others, some research demonstrates exactly the opposite. In fact, people who are high in self-esteem are more likely to be aggressive toward other people.

All participants were then randomly assigned to one of three conditions. Those in the applications condition were asked to list as many "implications or observations that this research finding would explain." Those in the explanations condition were asked to list as many reasons "why this finding could come about." Participants in the control condition received no writing instructions.

All participants then reported the likelihood that the finding was correct, using a scale ranging from 0% to 100%. Participants then rated the perceived value of the finding. Specifically, they indicated how important, meaningful, and personally relevant the finding appeared to them, as well as how likely the finding was to have an impact on society. All value ratings were made on 11-point scales ranging from 0 (*not at all*) to 10 (*a great deal*). Finally, participants rated the difficulty of the task on an 11-point scale ranging from 0 (*extremely easy*) to 10 (*extremely difficult*).

Results and Discussion

The difficulty people experience when generating information is often used as a cue for its validity (e.g., Schwarz, 1998), but

TABLE 1
Ratings of Value and Correctness in Study 1 and Study 2

Belief and measure	Condition			Predicted linear contrast	
	Explanations	Control	Applications	<i>t</i>	<i>d</i>
Similarity and attraction					
Correctness	62.4	62.0	61.3	-0.21	.05
Total value	4.64	5.13	5.93	2.3*	.55
Self-esteem and aggression					
Correctness	53.3	49.4	52.2	-0.19	.04
Total value	3.80	4.81	5.81	3.86***	.76
Greeks' belief in Poseidon					
Total value	5.51	6.48	7.36	2.97**	.90

Note. Correctness was rated on a 101-point scale ranging from 0 to 100. Total value is the average across ratings of value, which were made on 11-point scales ranging from 0 (*not at all*) to 11 (*extremely*).
 * $p < .05$. ** $p < .01$. *** $p < .001$.

between-condition differences in difficulty cannot account for our predicted effects as the difficulty ratings were inconsistent with our predictions. A one-way analysis of variance (ANOVA) on perceived difficulty yielded a marginally significant effect of condition, $F(2, 172) = 2.82, p = .06, d = 0.27$, with participants in the control condition (who were asked to do the least) perceiving the task as less difficult ($M = 1.43$) than those in the applications ($M = 2.54$) or explanations ($M = 2.12$) condition. These latter two conditions did not differ from each other, $t < 1$.

To test our main hypothesis about explanatory power, we created a single composite measure by averaging across the four dependent measures ($\alpha = .85$). As predicted, a 2 (scenario: similarity vs. self-esteem) \times 3 (condition: explanations vs. control vs. applications) ANOVA on this composite measure yielded a main effect for condition, $F(2, 169) = 8.99, p < .001, \eta^2 = .10$. There was no main effect of the particular scenario and no interaction between scenario and condition. As can be seen in Table 1, participants in the applications condition found their assigned belief to be the most valuable, whereas those in the explanations condition found their assigned belief to be the least valuable, linear contrast $F(1, 174) = 19.71, p < .001, d = 0.67$.

Perceived correctness of the belief did not show the same pattern, also as predicted. As can be seen in Table 1, there were no differences in the perceived correctness across conditions ($F < 1$). A 2 (scenario) \times 3 (condition) \times 2 (measure: correctness vs. value) ANOVA conducted on standardized values of correctness and value yielded only the predicted three-way interaction, $F(2, 165) = 9.01, p < .001, \eta^2 = .10$.¹

STUDY 2: OTHER PEOPLE'S BELIEFS

Understanding other people's thoughts and beliefs is a central feature of nearly all social interaction, and such understanding

influences people's behavior and attitudes toward one another. To the extent that the explanatory utility of a belief is used as a guide for determining the value of one's own beliefs, so too should it be used as a guide when making inferences about other people's beliefs. A long line of research, however, suggests that such social judgments tend to be egocentrically biased (Nickerson, 1999), and people are therefore likely to use their own perceived value of a belief as an intuitive guide to others' perceived value. In order to highlight the role of explanatory power in predicting other people's beliefs without possible contamination from egocentric biases, we asked participants in Study 2 to make inferences about a belief that none were likely to find even remotely valuable. Specifically, participants in Study 2 were asked to consider the extent to which the ancient Greeks valued their belief in the mythological god Poseidon, the god of the sea. As in Study 1, we expected that participants led to focus on applications would rate the belief as most valuable, whereas those led to focus on explanations would rate it as least valuable.

Method

Interested travelers ($N = 47$) in a Boston, MA, train station received a short paragraph about Poseidon:

In Greek Mythology, each god or goddess governed a specific part of the world, or represented a specific part of life that the ancient Greeks experienced. The sea was believed to be the realm of the god Poseidon.

Participants randomly assigned to the applications condition were then asked to list observations in the daily life of the Greeks that Poseidon could explain, whereas those assigned to the explanations condition were asked to list "observations that the average Greek citizen believed could explain Poseidon's behavior." Participants in a control condition received no writing instructions.

¹Degrees of freedom differ for analyses of correctness and value because some participants failed to respond to the correctness item.

On the next page, participants were asked how important Poseidon was to the ancient Greeks, how relevant Poseidon was to the ancient Greeks, and how meaningful Poseidon was to the average Greek citizen, using separate 11-point scales ranging from 0 (*not at all*) to 10 (*a great deal*).

Results and Discussion

Our main prediction was that participants in the applications condition would rate the belief in Poseidon as most valuable to the ancient Greeks and that participants in the explanations condition would list Poseidon as least valuable. A one-way ANOVA on the overall composite measure of value ($\alpha = .79$) confirmed this prediction, $F(2, 44) = 4.45, p < .05, d = 0.64$ (see Table 1). The perceived value of Poseidon increased as people considered applications of the belief, and decreased as people considered explanations for the belief.

Although the results of Study 1 and Study 2 are consistent with our hypotheses, in neither study did we try to influence the perceived value of an existing belief, nor did either study investigate beliefs that are generally considered to be especially valuable. In Study 3, we sought to do just that.

STUDY 3: CHERISHED BELIEFS

Few beliefs are more valuable to people than their religious beliefs. Wars are fought in defense of such beliefs, communities and nations are organized around religious institutions, and personal identities are often defined by the presence or absence of religious affiliations. Study 3 investigated whether people's religious beliefs could be influenced by highlighting the explanatory power of their God concepts. Much as in Study 2, participants were asked either to apply their concept of God to explain other observations (applications condition) or to consider observations that could explain God's behavior (explanations condition).

In addition, Study 3 manipulated explanatory utility by altering not only the observations participants were led to consider, but also the number of observations they were asked to generate. All else being equal, the more observations a belief can explain, the more valuable it should appear to be. Conversely, the more a belief can be readily explained by other observations, the less valuable it should appear to be. To investigate whether such effects would be observed with people's own religious beliefs, we asked participants in Study 3 to generate either 3 or 10 applications that God could explain, or 3 or 10 observations that could explain God's behavior. We predicted that increasing the explanatory power of God would increase the perceived value of participants' religious beliefs.

Because the vast majority of participants held Judeo-Christian beliefs, many were likely to see explaining God as exceedingly difficult (and perhaps somewhat inappropriate). In this religious tradition, God is perceived to operate auton-

mously without being influenced by the natural world, and God's behavior is therefore uncaused in the traditional sense. Consistent with this possibility, a pretest ($n = 33$) measuring the perceived difficulty of the four conditions revealed a significant main effect of the kind of observations listed (explanations vs. applications), but no effect of the number of observations listed. Listing observations that could explain God's behavior was perceived to be more difficult ($M = 6.61$) than applying God as an explanation for other observations ($M = 4.75$), $F(1, 29) = 4.71, p = .04$. To the extent that God cannot be readily explained, the belief in God may be relatively immune to a decrease in value. Nevertheless, we retained these conditions to maintain symmetry with the previous experiments.

Method

Eighty interested Harvard undergraduates received a questionnaire informing them that this study was investigating people's religious beliefs. Those in the applications condition were then asked to list either 3 or 10 observations that God can explain, whereas those in the explanations condition were asked to list either 3 or 10 observations that can explain God's behavior. Participants who considered themselves atheists were asked to list observations that a believer would likely make. When finished, participants answered four questions about their religious beliefs: "What is the general importance of God in your life?" "How important is God to you on a daily basis?" "How confident are you that God exists?" and "To what extent do you feel you have a personal relationship with God?" All responses were made on 11-point scales ranging from 0 (*not at all*) to 10 (*extremely*). One final question asked participants to rate their faith in God compared with the faith of the average Harvard student, on a scale ranging from -5 (*much weaker*) to 5 (*much stronger*).

Results and Discussion

Twenty-three of the 80 participants considered themselves atheists, which approximates the ratio in the Harvard population. We excluded these participants, but including them does not alter the significance levels of any of the following analyses.

To test our hypotheses, we first converted responses to the final comparative faith question from a scale from -5 to $+5$ to a scale from 0 to 10 by adding 5 to each response, thereby matching the scales for the other items. We then created a composite measure of belief in God by averaging together all five items ($\alpha = .98$). A 2 (number of observations: 3 vs. 10) \times 2 (condition: explanations vs. applications) between-participants ANOVA on this composite score revealed a significant main effect of condition, $F(1, 53) = 8.06, p < .01, \eta^2 = .13$, indicating greater belief in the applications condition than in the explanations condition. Neither the main effect of number nor the two-way interaction between condition and number was significant.

The pattern of means shown in Figure 1 suggests that the number of items listed amplified the effects of the applications

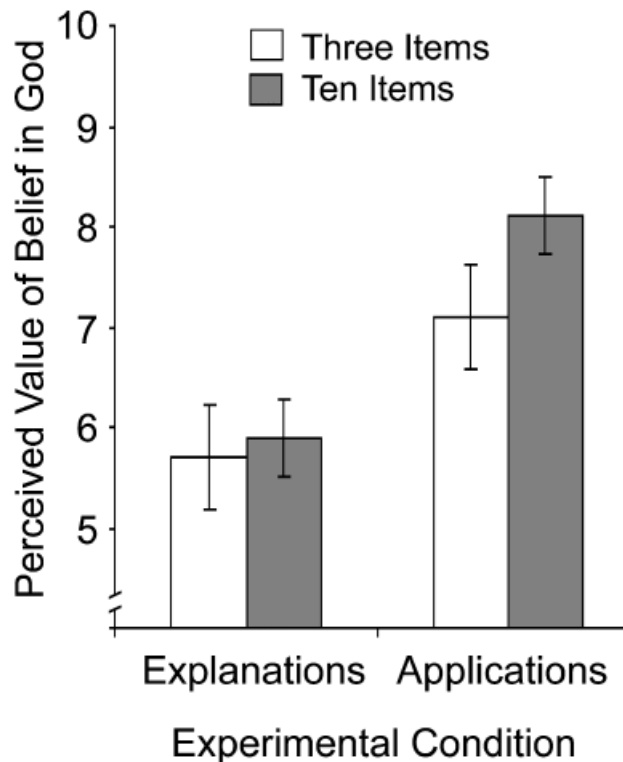


Fig. 1. Mean perceived value of belief in God as a function of experimental condition and number of observations in Study 3.

condition, resulting in a substantial increase in reported belief in God among participants asked to list 10 observations that God could explain. Indeed, a follow-up contrast indicated that belief was significantly higher in this condition than in the others, $t(53) = 2.67, p = .01, d = 0.77$. There was not a reciprocal decrease in belief as the number of explanations increased. This finding is not especially surprising as most of our participants did not believe that God's actions could be explained by much at all. In fact, none of the participants asked to list 10 explanations were able to do so, and participants in this condition listed only an average of 4.2 explanations—barely more than in the 3-explanations condition. There was no difference in belief in God between the 10-explanations and the 3-explanations conditions, it appears, simply because participants were unable to generate 10 explanations for God's behavior, and the experimental manipulation was therefore unsuccessful. In fact, the difficulty of explaining God's behavior may partially account for the extremely high value of belief in God. God is easy to apply but difficult to explain.

GENERAL DISCUSSION

Beliefs held with confidence may vary considerably in their perceived value to the believer, and the results of these three experiments suggest that one important component of a belief's value is its explanatory power. Those beliefs that can be broadly

applied to explain a variety of observations are considered to be more meaningful, important, and personally relevant than those that can be applied more narrowly. Whether considering novel beliefs, other people's beliefs, or their own cherished religious beliefs, participants found beliefs to be more valuable when they were led to apply their beliefs as explanations for other observations. In contrast, those beliefs that can readily be explained by other observations seem to lose some of their explanatory power, and therefore their perceived value. In both Studies 1 and 2, participants who considered observations that could explain a belief found that belief to be less valuable than those who did not consider such explanations.

To be sure, explanatory power is not the only mechanism through which beliefs derive their value. For instance, the perceived difficulty of generating applications or explanations may well moderate the perceived importance of the belief. Although we did not find that perceived difficulty could explain the results of the present experiments, substantial evidence suggests that a controlled manipulation of perceived difficulty would moderate the value of a belief (Schwarz, 1998). Also, variability in the importance of functional versus symbolic sources of value may moderate the importance of explanatory power. Functional sources of value—like explanatory power—may be especially important when people are motivated to possess accurate beliefs, whereas symbolic sources of value such as self-expression may be relatively more important when people are motivated to possess socially desirable beliefs. The present research is therefore not intended to supplant existing functional accounts of beliefs, but rather to expand on them by demonstrating an additional, and we believe critically important, source of a belief's value.

We believe that, in addition to shedding new light on the determinants of a belief's value, these results have important implications for persuasion. Like the marketer who points out the unique functionality of his or her favored gadget that can both slice and dice, so should influence peddlers advertise the unique and wide variety of observations that their favored beliefs can uniquely explain. Attempts to explain those beliefs, of course, should be left to their opponents.

Although we know of no research in the persuasion literature that has tested the persuasive appeal of applications versus explanations, we cannot help noticing that our predictions often seem confirmed in scientific discourse. People attempting to praise one's research often do so by highlighting its wide array of applications, whereas those attempting to belittle one's research do so by highlighting the host of existing mechanisms that could explain one's findings. What is more, higher levels of analysis within scientific discourse often appear—rightly or wrongly—to lose some of their appeal with the arrival of more basic levels of analyses. Broadly speaking, for example, sociology can be explained by the mechanisms of social psychology, social psychology can be explained by the mechanisms of cognitive psychology, and all perhaps eventually will be explained by

neuroscience. Part of the appeal, then, of these lower levels of analysis may be due to their apparent ability to explain higher-level phenomena. Of course, whether lower levels of analyses really ought to devalue higher levels of analyses is a functional issue that depends on what, exactly, one is trying to predict or explain.

We also believe these experiments can help account for people's resistance to explanations for their cherished beliefs. Those of religious faith, for example, seem threatened when scientific explanations—such as evolution—are offered for observations otherwise explained by religious concepts or when psychological concepts are used to explain religious belief itself. Even if these explanations do not impinge on the core tenets of a religious ideology, they may nevertheless seem to devalue religious beliefs, and lead to an intense resistance to such explanations. Indeed, the history of science and religion is replete with examples of such resistance. In some cases, it may be so intense that believers wish to avoid the search for underlying explanations altogether. Senator William Proxmire, for example, justified giving one of his “Golden Fleece Awards” to Ellen Berscheid and Elaine Hatfield for their research on love by stating, “I don't want the answer. I believe that 200 million other Americans want to leave some things in life a mystery” (cited in Hatfield & Walster, 1978, p. viii). Explanations for cherished beliefs can devalue those beliefs to such an extent that people may prefer to stop further understanding altogether. The results reported here may therefore shed explanatory light on culture wars that are likely to develop between groups who hold opposing beliefs, and thereby join the growing body of research investigating how cultural beliefs and practices arise from basic psychological processes (Gilbert, Brown, Pinel, & Wilson, 2000; Heath, Bell, & Sternberg, 2001; Lyons & Kashima, 2001; Schaller & Crandall, 2004).

Finally, this research suggests that the ultimately valuable belief (a) explains everything and (b) is explained by nothing. Few beliefs can manage this feat, but those associated with science and religion are the most common contenders. We think it is no accident that Western theology has historically depicted God as the “unmoved First Mover.” Both science and religion seek primary causes that can explain higher-level observations, albeit through different methods. It is of little surprise, given our findings, that believers in science and believers in religion so often come into direct conflict. What these experiments suggest is that at least some of this conflict can be attributed to the psychological mechanisms that create valuable beliefs. What these valuable beliefs share, our research suggests, is not simply their perceived truth, but their power as explanations.

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