

## Erosion of Belief and Disbelief: Effects of Religiosity and Negative Affect on Beliefs in the Paranormal and Supernatural

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**ABSTRACT.** The authors investigated the effects of religiosity and negative affect on beliefs in the paranormal and supernatural among 94 undergraduate students enrolled in psychology classes at a small, private U.S. university. They hypothesized that religiosity would predict differential beliefs in the supernatural versus the paranormal but that negative affect would attenuate these beliefs. In addition, the authors predicted that belief in the supernatural and negative affect would interact to predict belief in the paranormal. Overall, the results were consistent with predictions. The religious participants were skeptical of paranormal phenomena but were accepting of supernatural phenomena. In addition, increased reports of negative affect over the preceding year appeared to attenuate belief in the supernatural for the religious participants. By contrast, for the nonreligious participants, increased belief in both the supernatural and paranormal was predicted when reports of negative affect were high. Finally, the interaction of supernatural belief and negative affect significantly predicted belief in the paranormal.

**Key words:** belief, disbelief, negative affect, paranormal, religiosity, supernatural

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RESEARCHERS HAVE FREQUENTLY USED the terms *paranormal* and *supernatural* interchangeably in the empirical literature. However, factor analytic studies (Grimmer & White, 1990; Haraldsson & Houtkooper, 1996; Johnston, de Groot, & Spanos, 1995) of belief in the paranormal have indicated that certain individuals do make distinctions between paranormal phenomena (e.g., extra-sensory perception, or ESP; telekinesis; clairvoyance; precognition; com-

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munication with the dead) and the supernatural phenomena typically associated with Christian belief systems (the activity of supernatural agents such as angels or demons, the present-day occurrence of miracles, the causal power of prayer).

The thoughtful reader may object to the foregoing distinction in terminology, noting that the division is ambiguous, at best. And yet, certain populations do make such distinctions. Why people make such discriminations appears to depend on whether they have preexisting religious beliefs (Clarke, 1995). Prior beliefs may influence which phenomena are accepted as credible occurrences and which are treated with skepticism. Indeed, Christians may express disbelief about ESP or telekinesis but believe in guardian angels. We refer to this bias as *metaphysical chauvinism*, whereby one rejects certain quasi-empirical claims if they are not consistent with one's metaphysical assumptions, despite simultaneously holding beliefs that are equally unverifiable from an empirical point of view.

In the present study, however, we have contended that metaphysical chauvinism is shaped not only by prior religious belief but also by the life experiences of the individual. Consequently, researchers should address not only why certain individuals discriminate between these phenomena but also how their belief systems change and evolve in response to life experiences.

Constructivist cognitive psychologists have noted that cognitive structures are continually constructed and revised to assist in explaining and predicting experience (Mahoney, 1991). Cognitive structures, such as the higher level belief systems just described, give meaning to people's experiences and assist them in making sense of the flux of daily existence (Hayek, 1952). As noted, these structures are not static. Belief systems are fluid and dynamic; they adjust to the feedback gleaned from experience (Guidano & Liotti, 1983; Mahoney). Although beliefs in the paranormal or the supernatural are not tacit, "core-ordering" cognitive schemas, they are higher level cognitive products generated by more fundamental cognitive structures (Mahoney). Consequently, we hypothesized (a) that paranormal and supernatural belief systems would be dynamic and adjustable and (b) that changes in these beliefs would be symptomatic of the individuals' attempts to make sense of their experiences. Consistent with the cognitive constructivist models, we proposed that such adjustments would occur when the individual had experienced prolonged negative affect (Mahoney). During such periods, life cognitive structures are subject to revision, because prolonged negative affect may indicate a mismatch between cognitive structure and environment. In short, we hypothesized that shifts from skepticism to belief or from belief to skepticism would be intimately linked with an individual's emotional experience. Consequently, we predicted that an initial skepticism for both the paranormal and supernatural would give way to increasing belief after prolonged experiences of negative affect and, conversely, that a previously held belief would diminish during prolonged experiences of negative affect.

However, prior biases may constrain the direction of the cognitive structure's

evolution. People's searches for consistency between their experiences and their internal models of the world can proceed in a variety of directions. Yet, some changes may be more easily accommodated. In this view, although religiosity may create differential beliefs in the paranormal versus the supernatural, supernatural belief is similar to paranormal belief in its acceptance of nonempirical cause and effect. Thus, although metaphysical biases initially exist, they may break down more easily than does a comprehensive shift from belief toward a gross skepticism for all quasi-empirical phenomena. In short, prior biases may actually hide an underlying predisposition toward a particular belief system if the resulting belief system is relatively compatible with previously held beliefs. In support of this argument, some researchers have already indicated that prior religious faith can be predictive of paranormal belief (MacDonald, 1995; Schumaker, 1987; Williams, Taylor, & Hintze, 1989).

Although the actual content of paranormal and supernatural beliefs might strike some readers as trivial, we thought that an exploration of the dynamics of these higher level cognitive structures was important. Any attempt to explore the fluidity of human belief, opinion, and skepticism seemed worthy of scientific attention. We examined beliefs in the supernatural and paranormal because, although they seem very similar in actual content, many populations make distinctions between them. The present study was an attempt to understand why such distinctions are made and under what circumstances such distinctions may break down. Such investigations may illuminate why people believe what they believe and may describe the dynamic nature of these beliefs. Of particular interest were those variables that predict when and how people revise their beliefs to adopt new ways of viewing the world around them.

The basic purpose of the present study was to investigate the nature of differential beliefs in the paranormal and supernatural and the effects of prolonged negative affect on those beliefs. On the basis of the arguments described earlier, we made the following predictions. First, religiosity would predict differential beliefs in the supernatural and the paranormal: The religious participants would rate supernatural phenomena as more believable than paranormal phenomena (a replication of the metaphysical chauvinism bias); the nonreligious participants would not display this sort of differential belief.

Second, we posited that negative affect would interact with religiosity to predict erosion of belief or disbelief in the supernatural and in the paranormal. For the religious participants with increased negative affect, belief in the supernatural would decline as a consequence of disillusionment with a belief system in which there was prolonged negative feedback from the environment. For the nonreligious participants without prior religious biases and with increased negative affect, beliefs would increase in both the supernatural and the paranormal as a product of adjustments in cognitive structures in response to prolonged negative feedback. Phenomenologically, this would be interpreted as the participant's search for answers about the causes of their current life circumstances. There-

fore, we hypothesized that the predicted increases in belief would be evidence that this search included metaphysical explanations and solutions.

Last, although we predicted that disillusionment with the supernatural would increase for the religious participants with prolonged negative affect, we also predicted that a prior belief in the supernatural would predispose the participants to increased belief in the paranormal. Consequently, we posited an interaction between belief in the supernatural and negative affect in predicting belief in the paranormal. Specifically, a prior belief in the supernatural would predict increased belief in the paranormal with increased negative affect.

## Method

### *Participants and Procedure*

The participants were 94 undergraduate students (mean age = 21 years,  $SD = 1.69$ ; 63% women) enrolled in psychology classes at David Lipscomb University, a small (fewer than 3,000 students), private, Christian-affiliated institution in Nashville, TN. The participants completed measures of negative affect, religiosity, belief in the supernatural, and belief in the paranormal. They received course credit for participation.

### *Assessment of Variables*

*Negative affect.* We assessed negative affect by using the 10-item (e.g., "distressed," "upset") Negative Affect subscale of the Positive and Negative Affect Schedule (Watson & Clark, 1990). We asked the participants to rate the items on a Likert-type scale (1 = *very slightly or not at all*, 5 = *extremely*) according to their experience of negative emotions "over the past year." The Negative Affect subscale yielded an alpha coefficient of .81 in this sample.

*Religiosity.* In the rating of religiosity, the participants rated a single item, "How religious are you?" on a 5-point Likert-type scale (1 = *not at all*, 5 = *extremely*).

We obtained ratings of belief in the supernatural and the paranormal by having the students rate the extent of their beliefs in a variety of supernatural and paranormal phenomena.

*Belief in the supernatural.* On the Belief in Supernatural Scale (BIS), developed for the present study, the students rated on a 5-point Likert-type scale (1 = *I don't believe this*, 5 = *I definitely believe this*) the magnitude of their belief for 8 items describing various supernatural phenomena (e.g., "Angels exist and, at times, interact with earthly events," "Miracles have occurred and, at times, continue to occur," and "God communicates with people directly with words or strong feelings"). The BIS items yielded an alpha coefficient of .81. In addition, a principal

component analysis indicated that a single factor solution explained most of the variance between BIS items (eigenvalue = 3.55, 44.49% of variance).

*Belief in the paranormal.* On the Paranormal Questionnaire (PQ), also developed for the present study, the students rated on a 5-point Likert-type scale (1 = *I don't believe this*, 5 = *I definitely believe this*) the magnitude of their belief for 11 items describing various paranormal phenomena (e.g., "the use of ESP for communication," "the ability of dreams to anticipate future events," and "communication and/or contact, direct or indirect, with spiritual entities or the souls of deceased persons"). The PQ items yielded an alpha coefficient of .71. As with the BIS items, a principal component analysis of PQ items indicated that most of the variance between these items was best accounted for by a single factor (eigenvalue = 3.76, 34.2% of variance).

## Results

Religiosity was not significantly correlated with belief in the supernatural,  $r = .15$ ,  $p > .05$ . However, we noted a marginally significant negative correlation between religiosity and belief in the paranormal,  $r = -.23$ ,  $p = .06$ . Experiences of negative affect over the preceding year were positively correlated with belief in the paranormal,  $r = .25$ ,  $p < .02$ . Consistent with the factor analytic studies concerning the structure of paranormal belief (Grimmer & White, 1990; Haraldsson & Houtkooper, 1996; Johnston et al., 1995), supernatural belief and paranormal belief were unrelated,  $r = .01$ .

### *Negative Affect and Religiosity as Predictors of Belief in the Paranormal*

To test for the effects of negative affect on religiosity in predicting belief in the paranormal, we conducted a two-step hierarchical regression equation predicting belief in the paranormal. Before the analysis, we centered negative affect and religiosity scores by calculating the mean deviation scores for each variable for each participant. On Step 1 of the equation, we entered the two centered predictor variables (negative affect and religiosity). On Step 2 of the equation, we entered the interaction term of the centered predictors (Negative Affect  $\times$  Religiosity) to test for the presence of an interaction between the predictors.

The overall prediction was significant,  $F(3, 88) = 3.68$ ,  $p < .02$ ,  $R = .33$ . An analysis of the predictors revealed that the interaction term was not significant but that each of the predictors made a significant contribution in predicting belief in the paranormal. High religiosity predicted lower scores for belief in the paranormal,  $\beta = -.22$ ,  $t = -2.14$ ,  $p < .04$ , whereas high scores for negative affect during the preceding year predicted greater belief in the paranormal,  $\beta = .25$ ,  $t = 2.51$ ,  $p < .02$ .

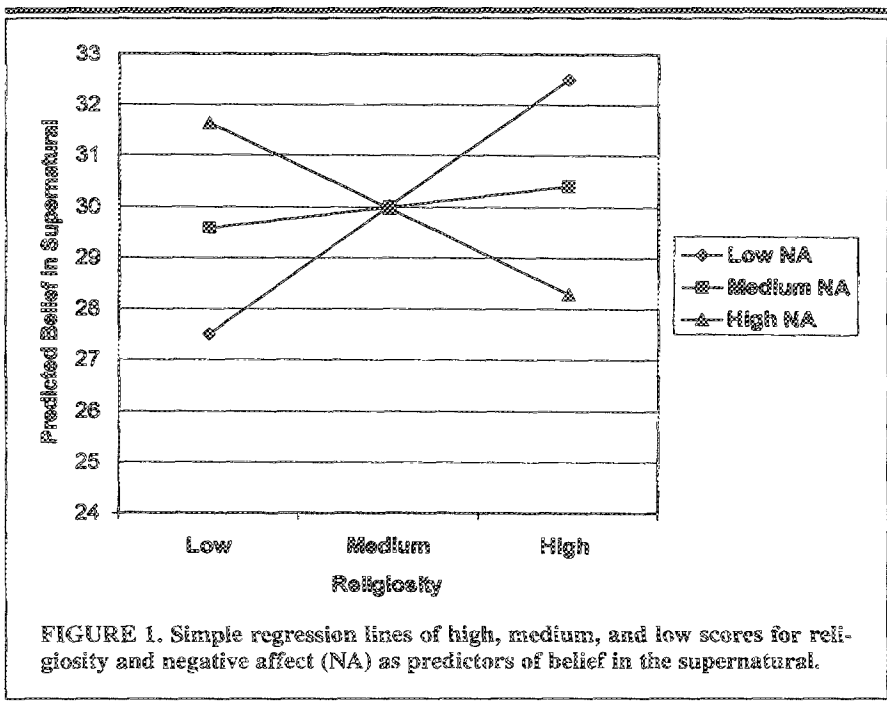
*Negative Affect and Religiosity as Predictors of Belief in the Supernatural*

To examine the effects of negative affect and religiosity in predicting belief in the supernatural, we conducted a similar two-step regression equation, this time predicting supernatural belief. We again entered the centered predictor variables (negative affect and religiosity) on Step 1 of the equation, with the interaction term entered on Step 2.

The overall prediction of supernatural belief was significant,  $F(3, 87) = 2.79$ ,  $p < .05$ ,  $R = .30$ . An analysis of the predictors revealed no main effects for either negative affect or religiosity. However, a significant interaction between negative affect and religiosity did predict belief in the supernatural,  $\Delta R^2 = .07$ ,  $F(1, 87) = 6.51$ ,  $p < .02$ .

To examine the interaction, as recommended by Aiken and West (1991), we plotted the simple regression lines for high, medium, and low scores for each of the predictors in predicting supernatural belief (Figure 1). As can be seen, a clear crossover interaction was present. For the nonreligious participants, belief in the supernatural increased as ratings of negative affect increased. Alternatively, for the religious participants, belief in the supernatural eroded as ratings of negative affect increased.

In conjunction with the findings from the first regression equation predict-



ing paranormal belief, the picture for the nonreligious and religious participants appears clear. For the nonreligious participants, belief both in the paranormal and in the supernatural increased as reports of negative affect increased. Alternatively, for the religious participants, an erosion of belief in the supernatural occurred as reports of negative affect increased. This erosion appeared to occur without any concurrent increases in belief in the paranormal.

### *Negative Affect and Belief in the Supernatural as Predictors of Belief in the Paranormal*

Our prediction was that belief in the supernatural, under certain conditions, would indicate a latent predisposition toward belief in the paranormal. Consequently, in the analyses just noted, religiosity, by itself, would not clearly test this hypothesis. To test this prediction directly, we used belief in the supernatural and negative affect as predictors for belief in the paranormal.

Toward this end, we conducted a final two-step regression equation by using negative affect and belief in the supernatural as predictors of belief in the paranormal. As before, we centered all predictors before entering them into the equation and forming the interaction term.

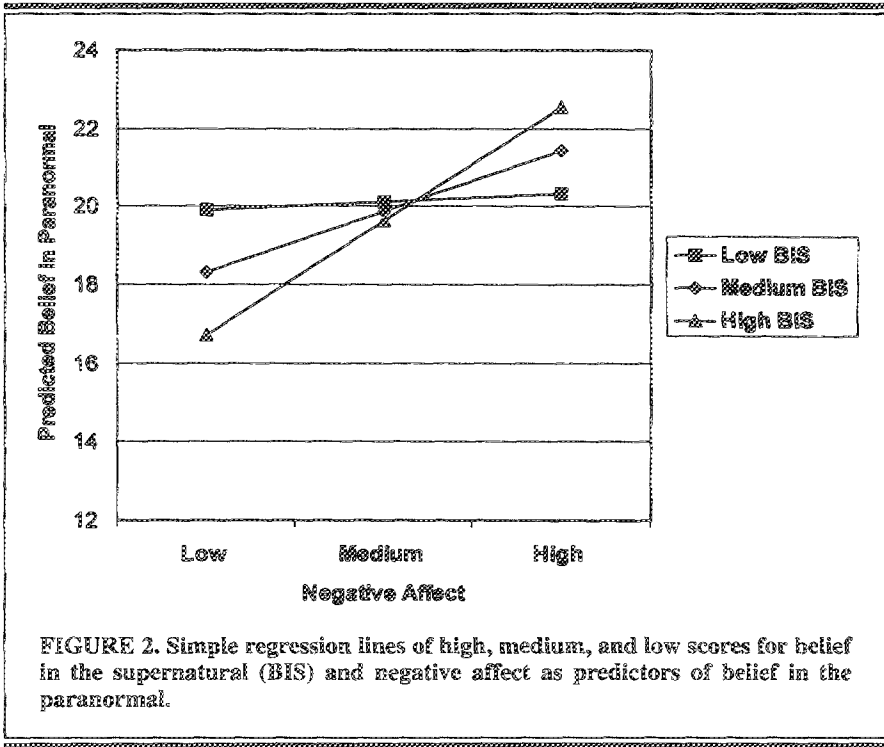
The overall equation predicting paranormal belief was significant,  $F(3, 87) = 3.92, p < .02, R = .35$ . Negative affect significantly predicted belief in the paranormal,  $\beta = .27, t = 2.54, p < .01$ . However, this effect was qualified by the presence of a second-order interaction between negative affect and belief in the supernatural,  $\Delta R^2 = .05, F(1, 87) = 5.32, p < .03$ . As before, we plotted simple regression lines for high, medium, and low scores for each of the predictors to interpret the interaction.

Figure 2 displays the interaction predicting belief in the paranormal with negative affect and belief in the supernatural as predictors. High ratings for belief in the supernatural with low ratings of negative affect predicted the most skeptical ratings for belief in the paranormal. However, as ratings of negative affect increased, those participants with high ratings for supernatural belief predicted the highest levels of belief in the paranormal. This finding appears to support the view that belief in the supernatural, under certain emotional conditions, is significantly predictive of belief in the paranormal.

## Discussion

### *The Erosion of Belief and Disbelief*

Overall, the present results present a relatively straightforward picture for the participants with low ratings of religiosity, for whom both paranormal and supernatural beliefs increased as reports of negative affect over the preceding year increased. It appeared that the nonreligious participants did not discriminate



between supernatural and paranormal beliefs. Consequently, for the nonreligious participants with increased negative affect, we observed a similar increase for belief in the supernatural as belief in the paranormal increased. That the nonreligious participants did not discriminate between the paranormal and supernatural is most likely attributable to a lack of preexisting religious biases. The results also indicate that both sets of beliefs increased as reports of negative affect over the past year increased.

We explained this trend by using a cognitive constructivist perspective, according to which people modify cognitive structures to generate a fit between belief and experience. For instance, nonreligious individuals, as their negative affect increases, may make efforts to alleviate their unpleasant life experiences. Some of these efforts may involve reevaluations of what can assist them in a given life circumstance. Would going to church help? Calling a psychic telephone service? Thus, a prolonged experience of negative affect may provide a motivation for people to explore a variety of potential solutions or explanations (some metaphysical) for their current life situations. However, as we suggested, this search is not constrained by prior religious prejudices for the nonreligious participants, leaving them free to explore a variety of beliefs and metaphysical explanations.

What about the religious participants? The present results paint a more complicated picture for the participants with high scores for religiosity. As predicted, the religious participants were more skeptical of the paranormal, a trend consistent with the metaphysical chauvinism seen in factor analytic studies of supernatural and paranormal beliefs (Grimmer & White, 1990; Haraldsson & Houtkooper, 1996; Johnston et al., 1995). Compared with the skepticism of the nonreligious participants, that of the religious participants for the paranormal persisted, even as reports of negative affect increased over the last year.

By contrast, the degree of belief in the supernatural for the religious participants depended largely on their emotional lives over the past year. If the preceding year had been relatively free of negative emotions, then their belief in the supernatural was high. Yet, with increased negative affect during the preceding year, their belief in the supernatural eroded. This provides an interesting contrast with the low-religiosity participants. We had predicted that belief in the supernatural would be at its highest level for two groups: the nonreligious participants who reported increased negative affect and the religious participants who reported little experience with negative affect.

We interpreted the findings by viewing belief and skepticism as extreme ends of a continuum for a given belief system. A person's beliefs may sit at either end of this spectrum of belief and disbelief (or somewhere in between). If a person is relatively content, happy, and free from negative affect, then he or she may feel little internal impetus to modify his or her current stance (skepticism or belief). But if negative affect increases over time, then the person may begin to gravitate toward the opposite end of the continuum. This model is a vast oversimplification, and it poses many more questions than it answers. However, we feel that this model may generate testable hypotheses for research concerning belief systems other than the paranormal and supernatural.

### *Biases in Changing Belief Systems*

In the preceding section, we discussed independent changes in beliefs in the supernatural and in the paranormal. We suggested that prior belief (regardless of its content) erodes to skepticism as the person experiences prolonged negative affect. However, because belief in the paranormal and belief in the supernatural are closely related (as evidenced by parapsychologists' grouping both sets of phenomena under the single descriptor paranormal), a person may gravitate toward a different, but closely related, belief system as negative affect increases. If one thinks of belief systems as occupying a "conceptual search space," then certain belief systems may lie more closely together than other belief systems within this space. Therefore, if a person becomes dissatisfied with his or her current beliefs, he or she may begin to search this space in the conceptual vicinity of the previously held beliefs. The present findings seem consistent with that suggestion. We predicted that the participants who were high in belief in the supernatural but reported little negative

affect would be the most skeptical about the paranormal. However, as their reports of negative affect increased, so did their belief in the paranormal. We feel that this finding provides support for the position that prior belief in the supernatural, with its acceptance of nonempirical cause and effect, may hide an underlying predisposition to accept other kinds of paranormal phenomena.

In conjunction with the previous discussion regarding the continuum of belief and skepticism for a single belief, one can now discuss the role of continua of belief–disbelief for entire networks of related beliefs and observe how belief and disbelief are adjusted across a span of metaphysical beliefs. Although there is probably no practical way to assess concurrent belief–disbelief adjustments across an entire network of related beliefs systems as they respond to life events, we feel that the results of the present study illuminate some of the basic dynamics for how and when such adjustments are made.

#### *Limitations and Future Directions*

The main limitation of the present study was the participants' retrospective assessments of negative affect and concurrent assessments of paranormal and supernatural beliefs. To test more directly for belief–disbelief adjustments in response to negative affect, researchers should replicate our study, first controlling for prior belief in the supernatural and paranormal and then examining these beliefs over time and in response to negative and positive life events.

In addition, the present sample of undergraduate students from a private Christian university clearly limits the generalizability of the results. Future investigators may want to examine the dynamics of paranormal and supernatural beliefs among populations without prior religious beliefs. Furthermore, the religious beliefs of U.S. college students are hardly representative of the religious diversity existing worldwide. The distinction between supernatural and paranormal may be an artifact of Western Christian thought. However, our deeper goal was to examine how two related belief systems, regardless of their content, are modified in the face of prior conviction and emotional well-being. Perhaps cross-cultural researchers could examine associated but separate beliefs in other cultures.

Beyond the foregoing design improvements, future researchers may also want to explore or challenge some of our interpretations. For instance, are belief–disbelief adjustments gradual, or are some abrupt? Is an agnostic stance toward a belief in the middle of a belief–disbelief continuum, or is it a radically different type of position? Do changes in beliefs persist over time? What are the immediate and enduring effects of these changes on emotional functioning? Do the present findings generalize to other beliefs, values, and attitudes?

To our mind, it is most important that future researchers assess the perceived psychological importance of a given belief. Beliefs vary in how central, deep, or fundamental they are. Changes in keystone beliefs may create more psychological turmoil than changes in beliefs that are not as fundamental. This is, perhaps,

the most intriguing limitation of the present study. Changes in one's belief concerning ESP can hardly be equated with the types of cognitive upheaval that occur when one adopts a radically new way of seeing him- or herself and the world. Before discrediting the present findings because of that limitation, however, one should note that changes in beliefs in the supernatural may be potentially traumatic. If people believe that life is kind through the agency of supernatural forces but do not experience such beneficence in their own lives, then the magnitude of their disillusionment and the psychological sequelae cannot be discounted as trivial.

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