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Abstract

The authors review experimental evidence that religious conviction can be a defensive source of compensatory control when personal or external sources of control are low. They show evidence that (a) belief in religious deities and secular institutions can serve as external forms of control that can compensate for manipulations that lower personal control and (b) religious conviction can also serve as compensatory personal control after experimental manipulations that lower other forms of personal or external control. The authors review dispositional factors that differentially orient individuals toward external or personal varieties of compensatory control and conclude that compensatory religious conviction can be a flexible source of personal and external control for relief from the anxiety associated with random and uncertain experiences.

Keywords

Compensatory control, belief in God, religiosity, external control, uncertainty, system justification

We believe that this good God, after He had created all things, did not abandon them or *give them up to fortune or chance*, but that according to His holy will He so rules and governs them that in this world nothing happens without His direction. . . . This doctrine gives us unspeakable consolation, for we learn thereby that *nothing can happen to us by chance*, but only by the direction of our gracious heavenly Father. He watches over us with fatherly care, keeping all creatures so under His power that not one hair of our head—for they are all numbered—nor one sparrow can fall to the ground without the will of our Father.

de Bres (1561/1984, p. 449-450, italics added)

Extreme religious conviction can seem paradoxical. It can entail presumptuous, even aggressive, personal confidence in the exclusive truth of one's own faith. But it can also rely on humble submission to a controlling external force as illustrated above. We propose a compensatory control interpretation of religious conviction that can account for both manifestations. We propose that some of the enduring psychological power of religious conviction may derive from its capacity to promote both external and personal control, which together provide a powerful shield from the anxiety aroused by randomness, confusion, or uncertainty. Although we acknowledge that religious conviction is not always defensive or extreme and can be grounded in thoughtful commitment to noble purpose and prosocial living, the perennial prevalence of seemingly defensive, antisocial religious extremes calls for improved understanding of defensive religious motivation.

Religious belief in supernatural agents of control, ranging from personal Gods to spiritual forces, has figured prominently in nearly every culture humanity has produced (Atran & Norenzayan, 2004; Boyer, 2001; Tylor, 1871/1958). Such belief may uniquely serve some specifically religious function (Pargament, Magyar-Russell, & Murray-Swank, 2005), but our research focuses on the basic psychological needs it can powerfully serve (cf. Epley, Akalis, Waytz, & Cacioppo, 2008; Greenberg, Landau, Solomon, & Pyszczynski, in press; Heine, Proulx, & Vohs, 2006; Jonas & Fischer, 2006; Kirkpatrick, 1998; Norenzayan & Hansen, 2006; Osarchuk & Tatz, 1973; Park, 2005). This type of approach, although not designed to identify a unique function of religiosity or spiritual belief, offers the advantage of connecting these types of religious beliefs to broad psychological models and a wide range of social-psychological behavior (Baumeister, 2002). In doing so, it holds promise for illuminating motivational mechanisms of defensive psychological processes that can turn religious conviction into such a volatile social phenomenon.

Below, we provide a detailed account of our compensatory control model, along with several lines of supportive evidence gathered across Western and non-Western countries and a variety of correlational, experimental, and neural paradigms. By treating religious belief as a dependent measure in experimental paradigms, our research provides a

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fresh perspective to complement much other research in this domain. Until recently, the empirical study of religion tended to rely on correlational studies examining relations between religiosity and various individual difference and well-being variables (Pargament, 1997, p. 174). In contrast, our largely experimental approach supports a causal process model of the elements of external and personal control that can heighten religious conviction.

Substitutable Personal and External Control and Implications for Religious Belief

For nearly half a century, several streams of social, personality, and clinical psychology have maintained a consistent emphasis on documenting the human drive to preserve beliefs in personal control and individual agency (Kelley, 1971; Kelly, 1955; Perkins, 1968; Presson & Benassi, 1996; Seligman, 1975, 1976; Skinner, 1995; White, 1959). A common theme across much of this research is that the belief in one's capacity to wield influence benefits physical and psychological well-being (Alloy & Abramson, 1982; Janoff-Bulman, 1992; Langer & Rodin, 1976; Lerner, 1980; Rothbaum, Weisz, & Snyder, 1982). One reason may be that personal control beliefs make the world seem like a less random, bewildering, and unmanageable place (Kay, Whitson, Gaucher, & Galinsky, *in press*).

Several research programs have converged on the notion that there exists a fundamental motivation to view the world as composed of understandable cause and effect relations (Greenberg, Porteus, Simon, & Pyszczynski, 1995; Heine et al., 2006; Jost, Banaji, & Nosek, 2004; Kruglanski, 1989a; Landau et al., 2004; Landau, Greenberg, Solomon, Pyszczynski, & Martens, 2006; Lerner, 1980; Whitson & Galinsky, 2008). Believing otherwise—that the world operates randomly or haphazardly—is stressful, anxiety provoking, and generally psychologically aversive (Janoff-Bulman, 1992; Pennebaker & Stone, 2004; Proulx & Heine, 2008; van den Bos & Lind, 2002). Beliefs in personal control offer one of the most easily accessible and direct modes of defense against such threatening perceptions. To the extent people believe that what happens to them, good or bad, will be the result of their own actions or ability, the world becomes less confusing and seemingly unmanageable. Accordingly, perceptions of personal control are often assumed to be fundamental to healthy psychological functioning (Janoff-Bulman, 1992; Lerner, 1980; Rothbaum et al., 1982).

At the same time, however, beliefs in personal control and personal agency vary greatly across situations, people, and cultures (Burger, 1989; Burger & Cooper, 1979; Dweck & Leggett, 1988; Iyengar & Lepper, 1999; Ji, Peng, & Nisbett, 2000; Pepitone & Saffiotti, 1997; Rodin, Rennert, & Solomon, 1980; Snibbe & Markus, 2005; Weisz, Rothbaum, &

Blackburn, 1984; Wohl & Enzle, 2003). If beliefs in personal control fluctuate so greatly, how else might people preserve a sense that the world is orderly and structured?¹ We propose that perceptions of order can be flexibly derived from interchangeable personal or external resources (Kay et al., 2009; Kay, Gaucher, Napier, Callan, & Laurin, 2008; also see Fritzsche, Jonas, & Fankhänel, 2008). When dispositional or situational factors militate against perceptions of personal control, people can rely on external sources of control to provide a comforting sense that things are under control, even if not by their own means. Even though external sources of control (e.g., a controlling God) are not necessarily conducive to personal control, they can effectively relieve the anxious uncertainty of a random and chaotic world. As such, we suggest that reliance on external control resources can promote psychological functioning for the same reason that personal control resources can. For the individual who may not be able or inclined to rely on personal control, sources of external control can provide an alternative means for guarding against the anxious uncertainty arising from random or confusing experiences.

Among the most culturally pervasive (and, as we will see, interchangeable) forms of external control are (a) religious and spiritual (e.g., God or Karma) belief and (b) political and institutional (e.g., a student's university, an employee's workplace, or a citizen's government) support (Jost & Banaji, 1994). As illustrated in the opening quotation, religious conviction (especially belief in a controlling God) can provide confidence that events, good or bad, do not just happen by "chance" or "fortune" but are controlled or willed, even if not by the self. Thus, when protective sources of personal control are lowered and the world seems perilously random and uncertain, beliefs in the existence of a controlling God may be a particularly attractive mode of coping. This argument implies that threats to personal control should increase religious conviction and belief in the existence of a controlling God, which should, in turn, relieve the anxious uncertainty.

Thus, our compensatory control model makes specific predictions about when people will heighten religious conviction to shore up personal and external control. Experiences that lower feelings of control should increase belief in religious sources of control. This effect should be mediated by anxious arousal and be strongest when the religious conviction is specifically linked to control. Furthermore, if modes of control are truly substitutable and compensatory, threats to any specific source of control should heighten any other. That is, (a) threats to personal control should cause reliance on compensatory external sources of control, (b) threats to external control should cause reliance on compensatory personal sources of control, (c) threats to one source of external control should cause reliance on alternative sources of compensatory external control, and (d) threats to one source of personal control should cause reliance on alternative sources of compensatory personal control. Below we review evidence

that supports these predictions, with special attention to the role that religious and spiritual conviction can play in restoring feelings of control.²

Effects of Personal Control Manipulations on Endorsement of Religious and Secular Sources of External Control

Religious External Control. Several studies have demonstrated that manipulations that lower beliefs in personal control increase beliefs in the existence of God, especially a controlling God. In many of these studies, personal control is threatened via a simple memory exercise in which participants are asked to “Please try and think of something positive that happened to you in the past few months that you had ‘absolutely no’ (or ‘had’ in the comparison condition) control over. Please describe that event in no more than 100 words.” Importantly, this manipulation creates a temporary decrease in feelings of personal control but does not influence mood or self-esteem (Kay et al., 2008).

Studies employing this manipulation have demonstrated that remembering a positive event over which one had no control leads to higher beliefs in the existence of a controlling God (sample items include, “To what extent do you think it is feasible that God, or some type of non-human entity, is in control, at least in part, of the events within our universe” and “To what extent do you think that the events that occur in this world unfold according to God’s, or some type of non human entity’s plan”) than does remembering a positive event over which one does have control.³ In other words, a manipulation that reduces feelings of personal control (but, importantly, does not lead to increased negative mood or decreased self-esteem) increases beliefs in the existence of God (Kay et al., 2008).

Because this manipulation of personal control requires participants to recall only *positive* events, these effects can be distinguished from previous research and theory on the belief in God that tends to exclusively associate lack of personal control with the occurrence of negative events (Park, 2005). This point is further buttressed by other recent research. In this research, it was demonstrated that priming participants via a scrambled sentence task that contained words semantically associated with uncontrollability (e.g., *random*, *uncontrollable*, *uncertain*) produced increased beliefs in God, but priming participants (also via a scrambled sentence task) with words semantically associated with only negativity (e.g., *slimy*, *terrible*) did not (Kay, Moscovitch, & Laurin, in press).

These studies demonstrate the basic phenomenon we predict—that lowered personal control will lead to increased beliefs in God. They tell us little, however, about the extent to which these effects are occurring for the reasons we presume—that is, that people are endorsing this system of

external control because the manipulation of personal control challenged people’s belief that the world is a controlled place. Fortunately, several different studies support our precise motivational account.

First, we have observed that the effect of the memory manipulation on beliefs in God is moderated by the extent to which God’s controlling nature is emphasized (Kay et al., 2008). In these studies, we follow our manipulation of personal control not just with the two items gauging belief in a controlling God or supernatural force but also with items that assess religious belief in a manner that does not also emphasize control. In this latter condition, when God’s ability to control the events that unfold in the universe is *not* emphasized in the wording of our dependent measure, the effects of the personal control manipulation on beliefs in God are weakened (Kay et al., 2008)—a pattern of moderation that suggests that the increased beliefs in God following the personal control manipulation were primarily because of the utility of this particular belief for reestablishing a generalized sense of order or control. Second, via the inclusion of measures that assess beliefs in order and nonrandomness between our personal control manipulation and belief in God dependent measure, we have also garnered mediational data that support our specific account (Kay et al., 2008). Namely, we have observed that the personal control manipulation does indeed threaten overarching beliefs in order and structure and that the magnitude of this threat response is what determines the influence of the personal control manipulation on beliefs in the existence of (a controlling) God.

Third, two different studies have demonstrated that the anxiety engendered by a lack of control plays a crucial role in the generation of compensatory belief in a controlling God. In one such study (Laurin, Kay, & Moscovitch, 2008), two groups of participants are taken through a guided visualization of the same anxiety-provoking scenario (“someone attacks you while walking home”). Half of the participants completed this visualization in the context of a manipulation of low personal control (“you are saved by the lucky appearance of a policeman”) and half in the context of a manipulation of high personal control (“you save yourself”). Both groups then reported beliefs in the existence of a controlling God. In both conditions, this scenario created considerable anxiety (measured both physiologically and through self-report). However, consistent with our model, feelings of anxiety predicted increased beliefs in the existence of God only for those participants who also had their beliefs in personal control threatened. In other words, in contexts of low, but not high, personal control, the more anxiety participants experienced, the more they reported believing in the existence of a controlling God.

In another study (Kay et al., in press), the role of anxiety was assessed via a misattribution of arousal paradigm, borrowed from Zanna and Cooper (1974; also see Proulx & Heine, 2008). In this experiment, participants were told we

were interested in testing the effectiveness of a new herbal supplement on color perception. On arrival, all participants swallowed this pill (which was, in fact, just an innocuous cellulose pill). The experimenter told half of the participants that the pill would have no side effects and told the other half that the pill might make them feel anxious. If, as we predict, manipulations that induce thoughts of low control increase belief in God via attempts to quell the anxiety arising from these thoughts, then those participants led to believe the anxiety they were experiencing was merely a side effect of the pill should not respond by increasing beliefs in the existence of a controlling God. Those not given the opportunity to “misattribute” the source of their anxiety, however, should demonstrate the typical effect. Indeed, this is what was found. For those participants who believed that the pill would have no side effects, a manipulation of low control (compared to a manipulation of just negative affect) led them to report higher beliefs in the existence of a controlling God. Those participants told the pill may make them feel anxious, however, showed no effect of the control manipulation on their beliefs in God.

Across several studies, then, there is converging evidence that manipulations that threaten feelings of personal control increase belief in a controlling God. This happens even when the manipulations of low personal control are positively valenced and relatively mundane. Furthermore, this effect seems to occur because threats to personal control arouse anxiety. Such findings suggest that the prevalence of beliefs in God may reflect, at least in part, a psychological process set in place to help relieve the anxious uncertainty associated with the threat lowered personal control poses to beliefs in an orderly world. In what follows, we describe data demonstrating that secular sources, just like religious deities, can serve to restore external control following personal control threats (cf. Jost et al., 2004).

Secular External Control

Political. When personal control is experimentally lowered (via the memory task described earlier), people become more supportive of their government and more resistant to changing it (Kay et al., 2008). That is, they become more likely to endorse statements that assert the government is performing its duties properly and less likely to endorse items suggesting the governmental system needs to be overhauled or restructured. In addition, experimental manipulations designed to *increase* feelings of personal control, compared to baseline conditions, freed people to increasingly criticize their government (sample items include, “I am becoming increasingly displeased with our system of government and its ability to run the country,” “Not enough is being done by the Canadian government to stop suspicious transactions that have occurred within the government,” and “In terms of cutting back on greenhouse gas emissions, the Canadian government really needs to get on board and start dealing more with the issue”).

That is, bolstering feelings of personal control increased the extent to which people criticized their governmental system (Shepherd & Kay, 2009).

Relational. The research described above focuses on external systems that impose some sort of overarching order to the social structure. But religious and political conviction may be so ubiquitous partly because it can effectively provide not only the kind of systemic external control described above but also another more relational kind of external control. People may also derive feelings of external control from the supportive relationships associated with political and religious affiliation.

When exposed to uncertain experiences, some people exaggerate their faith that close others will assume control on their behalf. In one recent study, Laurin, McGregor, and Kay (2009) first threatened personal control by having participants write about a precarious relationship in their life that was floundering out of control and had an unpredictable outcome. Participants in the comparison condition completed the same materials but about a relationship in someone else’s life. Participants then rated the extent to which they expected other people would support them in their most important, self-generated personal projects in life (e.g., get all A’s, stay healthy, take good care of my kids, enjoy life to the fullest). The personal control threat significantly increased some participants’ expectations of receiving social support in pursuit of their personal projects. That is, they believed they could count on relational support. In other research, mortality and uncertainty salience manipulations have similarly caused participants to idealize their close relationship partners, perhaps for similar compensatory control reasons (Marigold, McGregor, & Zanna, in press; Mikulincer, Florian, & Hirschberger, 2003). This form of relational external control has obvious overlap with the belief in many religious traditions that one can have a personal relationship with incarnations of a deity who cares and supports one’s personal endeavors. Thus, for some religious people, God may act as a supportive or controlling significant other (Epley et al., 2008; Kirkpatrick, 1998), which may account for some of the palliative social support and hope associated with religious coping (cf. Ai, Park, Huang, Rodgers, & Tice, 2007).

Effects of External Control Manipulations on Personal Control

We have also experimentally assessed the hypothesis that external control threats can cause compensatory personal control (Kay et al., 2008). Canadian participants led to believe that the government-run medical system was ineffective at fixing a randomly contracted illness, through the presentation of a video in which a woman described how the medical system failed to help her with her illness, subsequently demonstrated increased illusions of personal control

on a modified version of the Alloy and Abramson (1982) classic contingency task. In this task, participants are asked to estimate the extent to which they were able to learn how to “control” the onset of a green circle appearing on a computer screen by either pressing the space bar or not. Although the program was designed to ensure levels of actual control remained constant across conditions, those participants who first learned the governmental system was failing subsequently reported more control over the green dot than those participants who learned the government was doing its job adequately. In addition, correlational data collected from 67 countries also suggests a similar pattern (Kay et al., 2008): Lower levels of belief in governmental control are associated with higher reports of personal control.

It should be noted, however, that many people do not place a premium on personal control and individual agency (Iyengar & Lepper, 1999; Markus & Kitayama, 1991; Snibbe & Markus, 2005). For these people too, however, threats to a given external sources of control should still produce compensatory control phenomena. As we demonstrate in the following section, threats to one source of external control (e.g., the government) can also cause increased reliance on alternative sources of external control (e.g., religion).

Effects of External Control Manipulations on Endorsement of Alternative Sources of External Control

Secular External Control. The previous section reviewed evidence that external control manipulations cause a compensatory surge in personal control. Here we review some of our research on how external control manipulations can influence alternative sources of external control. According to our model of compensatory control, whenever any individual source of order is compromised, people will increasingly compensate by relying on different sources of order to relieve anxious uncertainty. But manipulations that make an external source seem more authoritative and controlling should also incline people to cleave to it.

In one experiment, participants were told that most of the outcomes in their life are under the control of either their federal government or their university. That is, participants read a fictitious set of data suggesting that people’s success or failure in life is controlled by the decisions and programs of their federal government in one condition or the decision and programs of their university in a second condition. Afterward, they were asked a series of questions to gauge their support for the policies of their university and federal government. Those participants told their fate was under the control of their university defended a specific funding policy (one based on merit rather than equality) more when told it was adopted by their university than when they were told it was adopted by their federal government. For those

participants told their fate was under the control of their federal government, however, the reverse pattern emerged: They defended the policy more when they were told it was adopted by their federal government than when they were told it was adopted by their university (Kay et al., 2009).

A corollary to this finding of increased support for effectively controlling external systems is that people should be expected to migrate their support from ineffective to effective external systems. In a study that tested this idea, participants’ faith in the American legal system was undermined by exposure to an article that depicted corporate crime going unpunished by an ineffective legal system (participants in the comparison condition read a similar article in which the crime was effectively punished). Results revealed that the ineffective legal system manipulation caused some participants to increase their endorsement of essays extolling the benefits of another external system of control—American capitalism (McGregor, Nail, Marigold, & Kang, 2005, Study 3).

Last, we have observed that threatening religious systems of external control also lead to increased faith in governmental systems. In one such study (Kay, Shepherd, Blatz, Chua, & Galinsky, 2009), Canadian participants read reports from a scientific study informing them that advances in theoretical physics, although unable to speak to whether or not God exists, have begun to inform questions of whether there appears to be divine intervention in the cosmos or not. In one condition, participants learned that physicists are becoming relatively confident that the operation of the universe can be explained entirely by scientific principles and that there appears to be no effect of any sort supernatural force, such as God. In the other condition, participants learned that physicists now believe there are certain physical phenomena that appear explainable only via some sort of other-worldly or divine control (crucially, a manipulation check demonstrated that participants in the former condition thought it less likely that a controlling God exists than participants in the latter condition). Afterward, all participants were asked questions gauging their confidence in the Canadian government. Consistent with our model, those made to be less confident in the existence of a controlling God subsequently demonstrated more confidence in the Canadian government’s ability to properly run the country.

Religious External Control. We have also employed several experimental paradigms to test the effects of threatening governmental systems of control on belief in religious control (Kay et al., 2009). In one such experiment, Canadian participants were exposed (under the guise of a memory task) to fictitious newspaper articles in which experts predicted the current Canadian minority federal government was likely to be abolished (which would require a new election) or was very stable and not at all likely to change. Participants then rated their beliefs in the possible existence of a controlling God. As predicted, participants in the unstable government condition reported more belief in a

controlling God than those in the stable government condition. We interpret this finding as evidence that when one source of external control (i.e., the government) is threatened, people will flexibly rely on another (i.e., God). However, it is possible that our manipulation of government stability threatened more than just its ability to offer control—one's federal government, as a representation of one's country, could also fulfill a sense of identity, and so our observed effects may have been because of the threat our manipulation posed to the government's ability to affirm identity (and the utility of God beliefs in restoring identity) rather than the government's ability to affirm order.

To tease apart these two mechanisms in a second study, a design was employed that directly compared the effects of threats to the government's ability to provide control and threats to the government's ability to provide identity (Kay et al., 2009). Specifically, participants were exposed to fictitious newspaper articles that described the government either as failing at providing control and order to its citizens or as failing to provide a sense of unique group identity to its citizens (e.g., "the government is allowing Canadian identity to dilute"). Afterward, participants were asked about the extent to which they believed in the concept of a God or some source of supernatural control. Beliefs in religious control were significantly higher following exposure to the passage that suggested the government was failing at providing control compared to the passage that suggested the government was failing at providing its citizens with a group identity.

Finally, in a longitudinal design, we attempted to replicate this general pattern of data in a non-Western sample and using a naturally occurring, rather than an experimentally manipulated, threat to governmental stability (Kay et al., 2009). To this end, we administered a questionnaire to Malaysian participants 2 weeks before and 2 weeks after their national election. Directly before an election, when the state of the government was in question, we assumed people would feel less confident about the stability of their government. As such, before an election, as compared to directly after it, participants should be less capable of relying on their government as a source of control and should therefore need to find alternative sources of external control, such as God. To test this idea, both before and after the election, participants were asked questions that gauged (a) the extent to which they view their government as stable and certain, (b) the extent to which they defended the government (e.g., "In general, the Malaysian political system operates as it should," "Most policies serve the greater good"), and (c) the extent to which they believe in the existence of a controlling God. Consistent with our model, participants were less certain about their government, less likely to defend it, and more likely to believe in the existence of God before as compared to after the election (despite the fact that there was no change in government after the election). In addition, a path analysis on the change scores between Time 1 and Time 2

demonstrated that immediately before the election, lowered perceptions of government stability led to lowered willingness to defend the government, which, in turn, led to increased beliefs in the existence of a controlling God.

Effects of Personal Control Manipulations on Personal Control

So far our review has focused on how political and religious external systems can furnish compensatory external control. However, religious conviction, when considered in both its intrinsic and extrinsic forms (Allport & Ross, 1967), involves more than just submission to supernatural external control. It can also provide self-confident personal agency and certainty. Religious conviction is thus well positioned to confer personal as well as external compensatory control. To understand how religious belief can also support this type of intrapersonal compensatory control process, it is useful to distinguish between two forms of personal control: volitional and epistemic.

Volitional Personal Control. Volitional personal control is the most obvious and extensively researched form of compensatory control. It refers to the feeling of being personally in control of one's outcomes. Certain varieties of religious belief, especially those that offer clear guides for living (e.g., ten commandments, eightfold path, four pillars) may support genuine feelings of personal volitional control. Confidence about what to do and value can confer efficacy, a key aspect of personal volitional control. Volitional personal control can be illusory, however. The illusory control response to an external control threat, demonstrated during the modified classic contingency task described earlier, is an example of exaggerated volitional personal control. Participants inflated their perceptions of the extent to which they actually controlled the onset of a randomly occurring event.

Threats to some facet of personal control similarly motivate exaggerations of volition control. In our recent research, mortality salience (McGregor, Gailliot, Vasquez, & Nash, 2007, Studies 1 and 3; McGregor, Zanna, Holmes, & Spencer, 2001, Studies 3 and 4) and various uncertainty-related threats that similarly undermine personal control (McGregor et al., 2001, Study 2; McGregor, Nash, Mann, & Phills, 2009, Study 3; Nash, McGregor, & Prentice, 2009, Studies 2, 3, and 5) have been shown to cause exaggerated estimates of autonomy, efficacy, and control over the personal projects that characterize participants' everyday personal lives (for evidence that mortality salience effects are at least in part driven by personal uncertainty and loss of personal control, see Fritsche et al., 2008; McGregor et al., 2001; and van den Bos, in press). In addition, threatening personal control by exposing psychology students to a baffling statistical assignment they could not complete (vs. assignment to a boring but nonbaffling statistics assignment) caused them to exaggerate the volitional aspects of their religious convictions. That is,

after the personal control threat, participants rated themselves as more determined to live and act in accordance with their religious beliefs, more willing to derogate others' religious institutions, more willing to argue for their religious opinions, and even more willing to support religious warfare (McGregor, Haji, Nash, & Teper, 2008, Studies 1-2; McGregor, Nash, & Prentice, 2009, Studies 2-3). The same compensatory increase in the volitional elements of religious control resulted in another study that threatened participants' control using the floundering relationship uncertainty threat manipulation described above (McGregor, Nash, & Prentice, 2009, Study 1).

Religious belief may also affirm feelings of volitional personal control via other means. These include vicarious control (Rothbaum et al., 1982), in which the individual identifies and develops feelings of self-other overlap with other powerful sources of control, and God-mediated control, in which the individual feels he or she influences the world indirectly through other powerful sources (e.g., praying; see Krause, 2005).

Epistemic Personal Control. A second form of compensatory personal control, epistemic personal control, refers to the tendency for people to have unrealistic convictions about their idiosyncratic opinions and values and the objectivity and social consensus for those opinions and values (Marks & Miller, 1987). It has long been proposed that beliefs in the objective truth of one's own views and identifying with others who share one's values and goals promote a kind of interpretive control that can be as empowering as volitional control (Rothbaum et al., 1982; cf. Shah & Kruglanski, 2000).

Various uncertainty threats cause compensatory epistemic personal control. For example, experimentally manipulated goal conflict (induced by requiring participants to mull over difficult personal dilemmas), mortality salience, and relationship uncertainty threats (induced by having them focus on uncertain relationships) all cause compensatory certainty and consensus about personal opinions and values. Specifically, after these various threats, participants see lists of between 10 and 15 diverse opinions about contentious, value-laden social issues such as capital punishment, abortion, and the U.S. invasion of Iraq and circle the opinion they agree with most. They then rate their certainty, strength, firmness and lack of ambivalence towards their selected opinion and estimate what percentage of the population would agree with their selected opinion. The various threats reliably heighten these markers of epistemic control (McGregor et al., 2001, Studies 1-2; McGregor et al., 2005, Studies 1-2; McGregor & Jordan, 2007; McGregor & Marigold, 2003, Studies 2-3). The extremes of exaggerated epistemic control in such experiments are striking. Participants typically move from having moderately deluded certainty and consensus scores to certainty scores averaging 8 out of 10 and consensus estimates approaching 80%. This is despite having just reviewed a list of 10 to 15 opinion options.

As most religions offer a clear interpretation and understanding of the world, along with a community of fellow believers that share this understanding, religious belief likely represents an excellent means of affirming this type of epistemic personal control. Indeed, we have found that participants react to the same psychological threats as described above with exaggerated epistemic control in the form of religious zeal. For example, they claim to be more confident in their religious beliefs, more certain that their religious beliefs are grounded in objective truth, more willing to state that their own religious beliefs are more correct than others' religious beliefs, and more convinced that others would agree with their own religious beliefs if only others would take the time to understand them (McGregor et al., 2008; McGregor, Nash, & Prentice, 2009). These findings are consistent with other labs' findings that various forms of personal control threat and uncertainty salience cause participants to react with group identity and worldview defense (Fritsche et al., 2008; Hogg, 2007; van den Bos, in press; cf. Heine et al., 2006).

Finally, compensatory personal control appears to be specifically mediated by a kind of negative affect related to anxious uncertainty. In several of the studies described above, manipulation checks revealed that feelings related to anxiety and confusion specifically resulted from the threats and in some cases mediated the defensive reactions (McGregor et al., 2001; McGregor et al., 2008; McGregor & Marigold, 2003).

Summary

There is considerable new experimental, correlational, and cross-national support for the predictions derived from our compensatory control perspective on motivated religious conviction. Experiences that lower feelings of personal control or lower faith in other sources of external control increase belief in an externally controlling God. This effect is mediated by anxious arousal and is strongest when religious convictions confer order and external control. On the other hand, experiences that lower feelings of personal control also cause people to bolster personal certainty and confidence about compensatory religious convictions, an effect that also appears to specifically arise from anxious uncertainty. The capacity of religion to purvey both external control (religious, secular, relational) and personal control (volitional and epistemic) may account for some of its perennial appeal.

Preference for Compensatory External Versus Personal Control

Thus, religiosity (both intrinsic and extrinsic; see Allport & Ross, 1967) may be particularly appealing in the face of anxious uncertainty because it can provide both external and

personal compensatory control. Other complex threat-caused outcomes in the social psychological literature, such as worldview defense or meaning maintenance, that have close psychological links to aspects of religiosity may similarly shore up both external and personal control (Fritsche et al., 2008; Heine et al., 2006; Landau et al., 2004). In the laboratory, subtle differences in how religious, meaning maintenance, or “worldview defense” dependent variables are operationalized may determine whether external or personal compensatory control processes predominate. For example, dependent variables that emphasize participants’ personal self-worth or connection to clearly shared group values and beliefs might more likely reflect personal compensatory control. In contrast, dependent variables that emphasize participants’ social support networks, the legitimacy of the system, or supernatural sources of control might more likely reflect external compensatory control. Outside the laboratory, there is no reason to assume that external and personal forms of compensatory control (especially in the context of religious belief) need to be mutually exclusive. Indeed, in the face of anxiety engendered by low control situations, people may increasingly submit to external control conferred by an interventionist God and at the same time feel personally empowered by the clarity of consensually accepted religious dogma.

Nonetheless, personality variables may affect the relative likelihood of engaging in external or personal compensatory control. Two general strategies for self-regulation highlight either the collective or the individual as the primary source of guidance and control for living (Markus & Kitayama, 1991). People with *interdependent* self-construals rely more on the social context and salient relationships for guidance, whereas people with *independent* self-construals primarily rely on their own personal beliefs and preferences for guidance. Interdependent self-construal is associated with a prevention-focused motivational orientation that focuses on avoiding undesirable outcomes (Hamamura & Heine, 2008). In contrast, independent self-construal is associated with high self-esteem and a promotion-focused motivational orientation that focuses on promoting optimal and idealized outcomes (Hamamura & Heine, 2008). Indeed, only participants with high self-esteem, independent self-construal, and promotion-focused personality orientations react to the personal control threats described in the previous section (i.e., personal dilemmas; difficult statistics; uncertain relationships) with compensatory *personal* control reactions (Laurin et al., 2009; McGregor et al., 2005; McGregor, Nash, & Prentice, 2009; McGregor & Marigold, 2003). In contrast, participants with low scores on orientations related to personal agency assimilate to the threat and decrease their estimates of personal control when faced with these threats (Laurin et al., 2009). Instead, to maintain a sense of control they increase estimates of *external* control, as assessed by a measure of the extent to which they expected supportive

others to help them with their most important personal projects in life (Laurin et al., 2009). Future research is needed to assess whether similar personality differences moderate the extent to which individuals cleave to the personal or external control aspects of religious conviction.

Discussion

Religious belief has proven remarkably persistent across time and geography. Given this “stickiness,” it is highly likely that religious belief is a multidetermined phenomenon, capable of serving several separate (although potentially overlapping) psychological functions, including the human need to cope with mortality (Greenberg et al., in press; Jonas & Fischer, 2006; Norenzayan & Hansen, 2006; Osarchuk & Tatz, 1973), the search for and preservation of meaning following the experience of traumatic events (Park, 2005; also see Heine et al., 2006), motivations to affiliate with stable, trustworthy attachment figures (Kirkpatrick, 1998), needs for social companionship (Epley et al., 2008), and benefits of group support and loyalty (Fritsche et al., 2008). At least part of the power of religion likely comes from its potential to simultaneously serve so many vital psychological needs. To fully understand religious belief, then, it is crucial to understand these various processes.

The specific process we focus on in this review is religion’s capacity to provide a balanced repertoire of compensatory control strategies. As described throughout much of this review, belief in a controlling religious deity may serve as an especially attractive resource for restoring a sense of externally controlled order when personal control cannot protect one from the anxiety of a random and uncertain world (Kay, Moscovitch, & Laurin, in press; Laurin et al., 2008). On the other hand, zeal for personal religious convictions may provide a haven of personal control when conventional sources of external control seem tenuous. Religion may empower feelings of epistemic personal control via shared creeds, faith, meanings, “logos,” and group beliefs (Fritsche et al., 2008) and also inspire volitional personal control via clear injunctions to orient one’s will toward the ideal of holy living and identify with omnipotent and omniscient deities. Moreover, both forms of compensatory religious control—personal and external—may be particularly reliable when compared to temporal sources of control because religious “faith” in transcendent truth is often impervious to counterargument or evidence. In short, religious belief may offer multiple routes for salvation from the anxious uncertainties inherent in human life.

Lest our analysis seem overly cynical in its depiction of religion as merely a defense mechanism, we are advised to remember that not all forms of religious faith are compensatory and William James’s conclusion not only that religion provides a vital solution to the human existential condition but also that, on the whole, it tends to encourage generous,

compassionate, and courageous living (James, 1902/1958; cf. Armstrong, 2006). Indeed, religious belief and conviction are negatively correlated with error-related activity in the anterior cingulate cortex (ACC), the part of the brain that initiates anxious alarm during conflict and uncertainty (Inzlicht, McGregor, Hirsh, & Nash, 2009). Such basic, neural insulation from chaos may account for the positive health outcomes and resilience of the religious in the face of loss of control associated with failure, hardship, and death (Baumeister, 2002; Pargament, 2002; Park, 2005). Furthermore, such insulation may also help people to function more efficiently. Indeed, Inzlicht et al. (2009) found that the more religious participants in their studies not only experienced less ACC-generated activity in response to errors but also performed better, with fewer errors on a Stroop task. Rather than being an opiate, Inzlicht et al. proposed that religious conviction functions more like an anxiolytic that can promote effective action. Still, muted error and uncertainty detection could, for some people under some circumstances, promote a cavalier disinterest in truth and accuracy and unleash the more deluded varieties of religious extremism so often featured in the headline news. Future research assessing personal and situational moderators within the experimental compensatory control framework proposed here may hold promise for further understanding the triggers of antisocial versus prosocial varieties of religious experience.

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Notes

1. Although not all people do successfully maintain the belief in order and nonrandomness, the failure to do is presumably rare and has been associated with many psychological illnesses, including anxiety and depression. Indeed, many forms of therapy, including overcoming depression, anxiety, trauma, and addiction, focus on trying to reestablish in patients a sense of (personal or external) control.
2. It is this emphasis on external forces of control that distinguishes the construct we are interested in—control—from related constructs such as personal control, personal agency, and self-efficacy. Agency, personal control, and personal efficacy, although they each have subtle differences between them, all focus on the *individual's* ability to himself or herself affect his or her own outcomes. The generalized construct of control, however, includes both the control exerted by the individual and the control exerted by forces external to the individual,

such as religious and governmental systems. These external forces are, in one respect, opposite to personal control, insofar as to the extent external forces control his or her outcomes the individual does not (although there can be exceptions to this, such as when people attempt to wield personal influence via appeals to these external systems rather than simply submitting to their power). It is this inclusion of external forces of control, and our suggestion that the human reliance on them can decrease the anxiety arising from random and confusing experiences in much the same way that beliefs in personal control can, that distinguishes how we define “control from constructs,” such as personal control, agency, mastery, efficacy, and the like, that solely focus on the individual.

It is also worth noting that control, as defined this way, differs in an important way from the construct of prediction. Namely, although external control is sufficient to increase beliefs in order and nonrandomness, it does imply increased predictive ability. Knowing that someone or something, such as a God, has a “grand plan” or is “in charge” allows the individual to know that whatever happens is planned but does not *necessarily* give the individual insight into what that plan is. Thus, these two constructs are not identical. However, given that people do also have a preference for prediction (Kruglanski, 1989b) whereas forces of external control need not also provide for prediction (as is the case with certain conceptions of God—e.g., “God works in mysterious ways”), those that combine control with prediction are likely to be particularly attractive.

3. This measure, it should be noted, focused only on the supernatural aspects of religious belief. This is because this program of research was designed to help explain that specific aspect of religious belief (which others have noted is perhaps the key unifying aspect of all religions; Atran & Norenzayan, 2004) and not all of its facets. It does, however, strongly correlate with general measures of religiosity ($r = .74$; Kay, Gaucher, Napier, Callan, & Laurin, 2008, Study 1).

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