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Authors
Souza, Andre L.
Legare, Cristine H.

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André L. Souza (andre.souza@crdh.concordia.ca)
Concordia University
Department of Psychology, 7141 Sherbrooke St. W.
Montreal, QC H4V 1N3 Canada

Cristine H. Legare (legare@psy.utexas.edu)
The University of Texas at Austin
Department of Psychology, 1 University Station, A8000
Austin, TX 78712 USA

Abstract

Reestablishing feelings of control in the face of uncertainty is a fundamental motive for human behavior. We propose that rituals (i.e., socially stipulated, causally opaque practices) provide a means for coping with the aversive feelings associated with randomness due to the perception of a connection between ritual action and a desired outcome. Two experiments were conducted (one in Brazil [$N = 40$] and another in the U.S. [$N = 94$]) to evaluate how the perceived efficacy of rituals is affected by feelings of randomness. In a between-subjects design, the Scramble Sentence Task was used as a priming procedure in three conditions (i.e., randomness, negativity, and neutral) and participants were then asked to rate the efficacy of rituals used for problem-solving purposes. The results demonstrate that priming randomness increased participants' perception of ritual efficacy relative to negativity and neutral conditions. Implications for increasing our understanding of the relationship between perceived control and ritualistic behavior are discussed.

Keywords: Randomness; Ritual; Perception of Control; Supernatural Cognition.

Introduction

Anthropologists have long noted that the use of rituals for instrumental purposes is linked to conditions of risk and uncertainty (Malinowski, 2004). When Malinowski visited the Trobriand Islands of New Guinea, for example, he noted that at times the Trobrianders would base their behavior on practices with clear causal rationales while at other times they would rely on causally opaque practices such as ritual. The Trobrianders rarely relied on ritual when fishing in a reliable and safe setting such as the lagoon; they described their successes and failures in terms of skill. In contrast, extensive ritual preceded the uncertain and dangerous conditions of deep-sea fishing.

The Trobriand fishermen are not alone in their use of ritual to restore feelings of control when confronted with uncertainty (Souza & Legare, 2011). On college campuses, for instance, up to 70% of students employ such strategies to assist with performance on exams (Gallagher & Lewis, 2001) or athletic competitions (Bleak & Frederick, 1998; Ciborowski, 1997; Todd & Brown, 2003; Van Raalte, Brewer, Nemeroff, & Linder, 1991; Vyse, 2000; Womack, 1992).

To the extent that the rituals have little or no actual bearing on the success of instrumental outcomes (Lobmeyer & Wasserman, 1986) through a process of physical causation (Legare & Herrmann, 2013; Legare & Souza, 2012; Humphrey & Laidlaw, 1994), we propose that one of the functions of rituals is to maintain an illusion of control, a phrase coined by Langer (1975). An illusion of control is inferred when participants believe or respond as if contingencies between their behavior and the outcome exist, even if the outcomes are random (Alloy, Abramson, & Viscusi, 1981; Matute, 1994). Regardless of how the illusion of control is manipulated, all dependent measures reflect a belief that one's actions can influence an outcome that is, in fact, outside of their control.

There is considerable empirical evidence demonstrating that lack of perceived control – an individual's belief that he or she cannot predict and affect future events – has applied consequences and is associated with a number of negative outcomes. For example, it contributes to the tendency to demonstrate depressive and pessimistic behavior and avoid facing challenging situations (Fast, Gruenfeld, Sivanathan, & Galinsky, 2009). Conversely, feelings of control promote increased self-esteem, optimism and greater sense of agency (Scheier, Carver, & Bridges, 1994). Despite the benefits associated with feelings of control (Kofta, Weary, & Sedek, 1998), people frequently experience situations in which they lack the capacity to exert the control they desire. Many of the most pervasive ailments that afflict humans such as chronic illness (e.g., cancer), economic insecurity (e.g., unemployment) and interpersonal problems (e.g., infidelity) are often not within our control.

When people are unable to control and predict their environment, attributional biases are activated and strategies are implemented to restore feelings of control (Underwood, 1996; Vaughn & Weary, 2003; Weary & Jacobson, 1997; Weary, Jacobson, Edwards, & Tobin, 2001). For example, people detect correlations among random sets of stimuli that are presumably unrelated when they are primed with feelings of lack of control (Whitson & Galinsky, 2008). There is also evidence that when desire for a coveted item and uncertainty are high and personal control is lacking, people may be more likely to help others, as if they can encourage fate's favor by doing good deeds proactively.

Seminal work on the illusion of control and magical thinking has examined first-person experiences with superstitious behavior (Keinan, 1994) or procedures that approximate rituals (Rudski, 2001; Rudski & Edwards, 2007). Keinan (1994)

explains the increase in superstitious behavior under conditions of stress and uncertainty as an attempt to regain control. Rituals, which we define as conventional, causally opaque procedures may provide a means for coping with the aversive feelings associated with randomness by reestablishing feelings of control. We propose that the structure of ritual can be interpreted in light of intuitive causal beliefs (Legare & Souza, 2012) and predict that intuitive causal reasoning, not familiarity with the content of particular rituals, drives how ritual efficacy is evaluated.

Despite the fact that engaging in causally opaque practices may seem to be a paradoxical means of increasing perceived control, we hypothesize that this is possible because rituals provide a socially stipulated and culturally sanctioned opportunity to exert agency through action, thereby giving the illusion of increased control (Thompson, Armstrong, & Thomas, 1998). We propose that priming randomness increases the activation of attributional biases to detect a connection between action and outcome as a means of reestablishing feelings of control. The perception of a connection increases the evaluation of ritual efficacy. We predict that this effect occurs not only in first-person experiences with uncertainty (Keinan, 1994, 2002) but also implicitly when evaluating the experiences of others. Two studies investigated this prediction directly by examining whether priming randomness affects the perception of the efficacy of rituals.

Study 1 was conducted in Brazil, a cultural context in which a particular type of ritual – called simpatia – is used to treat a variety of problems. Simpatias are ritualistic remedial procedures used to solve everyday biological (e.g., sinusitis, asthma), psychological (e.g., depression, anxiety), and interpersonal problems (e.g., attracting a partner, infidelity). They are available to the general population, are relatively low-cost, and do not require any specialized expertise to be performed. Despite the lack of a physical-causal mechanism underlying their efficacy, simpatias are widely endorsed and used for a greater variety of problem-solving purposes. For example, a simpatia to cure depression might require a person to drink coconut water straight from the coconut and then bury the coconut husk in a garden full of flowers (Legare & Souza, 2012).

Legare and Souza (2012) designed experimental simpatias to match the characteristics and content of existing ones. A selection of these simpatias was used in the current studies to assess perceptions of ritual efficacy. To prime feelings of randomness, we used a previously validated task called The Scrambled Sentence Task – SST (Kay, Moscovitch, & Laurin, 2010). A more detailed description of the task is provided below.

Study 1

Methods

Participants Forty Brazilian Portuguese-speaking adults participated in the study. Participants were recruited from the metropolitan area of the city of Belo Horizonte located in the southeastern region of Brazil. They were recruited from public health centers located in a peripheral neighborhood of Belo Horizonte. The public health centers (known as *Posto de Saúde*) are centers maintained by the city administration, and serve the population from the community in which the center is located.

According to the Brazilian Institute of Geography and Statistics, Belo Horizonte has a population of over 6,082,776 people. The ethnic composition of the population is 47% Black, 41% Pardo (mixed-race), and 12% White.. In terms of religious composition, over 68% of the population self-identify as Catholic, 19% Protestant, and 8% of the population reported not having any religious affiliation. Although census data has traditionally failed to capture the range of religious traditions available in Brazil (especially those of Afro-Brazilian roots), the endorsement of simpatias exists across all religious groups.

Materials To assess the perceived efficacy of rituals, we used simpatias designed by Legare and Souza (2012). They were designed to match the characteristics of existing simpatias to maximize ecological validity. A previously validated task called *The Scrambled Sentence Task* – SST was used to prime randomness in one condition and negativity in the other (Kay et al., 2010). A baseline condition containing neutral words was also created. In the SST, each participant is given 20 scrambled sentence strings composed of five words each. Participants were asked to rearrange four of the five words to form a meaningful sentence and then to cross out the one word left out. For half the participants, the word sets contained words related to randomness (e.g., *chaotic*) and for the other half, these words were replaced with negatively valenced control words (e.g., *lazy*). This procedure is similar to the one used by Kay et al. (2010).

Procedure Participants were randomly assigned to one of the two conditions (i.e., *randomness condition* and *negativity condition*). The second author, a native speaker of Brazilian Portuguese, interviewed each participant individually. Each participant was given a set of words (according to the condition assigned) and was asked to form sentences. Participants were allowed to take as long as they wanted to for the sentences. For the randomness condition, 10 of the 20 lists contained randomness-related words, whereas for the negativity condition, these 10 words were replaced with negatively valenced words.

Following the priming task, participants were presented with six simpatias paired with specific problems. The order of presentation was randomized across participants. Then participants were asked: *"In a scale from 1 to 10, 1 being EFFECTIVE and 10 being INEFFECTIVE, how much do you think this simpatia is effective for treating this specific problem?"*

Results and Discussion

Preliminary analysis revealed that the priming manipulation affected all six simpatias equally, that is, in terms of efficacy ratings, there was no main effect of specific simpatia used and no interaction between specific simpatias and the priming procedures. Thus, the ratings of the six simpatias were averaged to form a single index of ritual efficacy for each participant. Results revealed that participants in the randomness condition rated the simpatias as significantly more effective (M = 4.33, SD = .31) than participants in the negativity condition (M = 4.64, SD = .40), $t(38) = 2.65$, $p < .05$, (simpatias with lower ratings were judged to be more effective than simpatias with higher ratings).

This finding supports the hypothesis that the evaluation of ritual efficacy increases when the motivation to reestablish control is primed. Rituals may provide a mechanism for accomplishing this goal (Keinan, 2002). Alternatively, however, this pattern of data could potentially be explained by the possibility that negativity reduced perceptions of efficacy, instead of randomness increasing perceptions of efficacy. To address this potential alternative explanation, in Study 2 we included a third condition containing neutral words. In previous research by (Legare & Souza, 2012), the evaluation of ritual efficacy did not vary between populations familiar with (*e.g.* in Brazil) and unfamiliar with (*e.g.* in the U.S.) simpatias. Thus to examine the generalizability of the results from Study 1 in a population unfamiliar with the content of these culturally specific rituals, Study 2 was conducted in the U.S.

Study 2

Methods

Participants Ninety-four undergraduate students at a large research university located in the southwest of the United States participated in Study 2 for course credit.

Materials The materials used in Study 2 were identical to the materials used in Study 1 except that they were translated from Brazilian Portuguese into American English by the second author.

Procedure The procedure for Study 2 was identical to Study 1 except that the simpatias and efficacy ratings questions were presented using *E-Prime* rather than being read to participants. Again, participants were asked to rearrange four of the five words to form a meaningful sentence and then to cross out the one word left out. For 33 participants (randomly selected), the word sets contained words related to randomness (e.g., *chaotic*), for 32 participants, these words were negatively-valenced words (e.g., *lazy*) and finally for 29 participants, the words were neutral words extracted from the ANEW database (Bradley & Lang, 1999).

Results and Discussion

The objectives of Study 2 were to examine the generalizability of the effect in a cultural context unfamiliar with simpatias and explore the possibility that negative words reduced the evaluation of ritual efficacy. As predicted, although the simpatias were rated as less effective in the U.S. sample than in the Brazilian sample (consistent with Legare & Souza, 2012), a one-way ANOVA revealed a main effect of condition, $F(2,91) = 5.07$, $p < 0.05$, $\eta^2 = .10$ on the efficacy ratings. Post-hoc tests (Bonferroni corrected) demonstrated that participants primed with randomness rated the simpatias as significantly more efficacious (M = 8.06, SD = 1.64) than participants in the neutral condition (M = 9.01, SD = .97), $t(60)$ = -2.71, $p < .002$, and marginally more efficacious than participants in the negativity condition (M = 8.84, SD = 1.02), $t(63)$ = 2.27, $p = 0.02$. Notably, there was no significant difference between the efficacy ratings of people in the neutral condition and negativity condition (See Figure 1). The results demonstrate that even with unfamiliar content, priming randomness increased ritual efficacy evaluations, consistent with the results of Study 1. Moreover, the lack of difference between the negativity and neutral condition suggest that randomness increases perceptions of ritual efficacy, rather than negativity decreasing ritual efficacy evaluation.

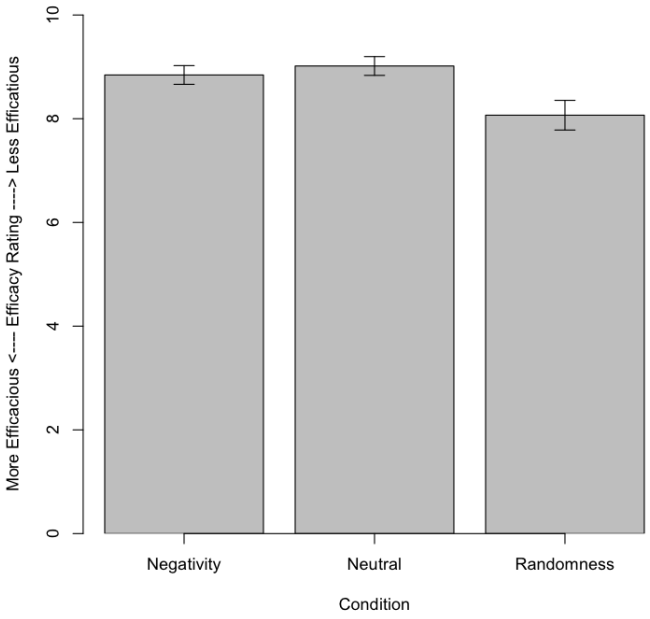

Figure 1: Mean Efficacy Ratings per Condition in Study 2

Discussion

In the face of randomness, attributional biases are activated and strategies are used to cope with feelings of lack of control (Weary & Edwards, 1994; Weary & Jacobson, 1997; Weary et al., 2001; Wichman, Brunner, & Weary, 2008). We propose that rituals provide a means for coping with the aversive feelings associated with lack of control. The current studies sought to examine this possibility empirically by investigating the extent to which priming feelings of randomness influences perceptions of ritual efficacy.

Our results support the hypothesis that perceptions of the

efficacy of ritualistic behavior are influenced by the drive to regain a sense of control. Participants primed in the randomness condition rated simpatias as significantly more efficacious than participants in the control condition. One potential explanation for this effect is that the experience of randomness triggered by the manipulation activated a need to reestablish perceived control. Rituals may provide a mechanism for accomplishing this by providing an opportunity to posit a connection between action and outcome.

Examining the interplay of perceived control and ritual is of pervasive interdisciplinary interest with longstanding roots in both anthropology and experimental psychology (Keinan, 1994; 2002; Rudski & Edwards, 2007). Despite this interdisciplinary interest, these studies are the first to examine the relationship between priming randomness and reasoning about the efficacy of ritualistic practices used by others. By examining this relationship experimentally, we have demonstrated that ritual may serve as a mechanism for reestablishing the perception of control and have provided insight into the cognitive underpinnings of the evaluation of ritual efficacy. Studying ritual from this perspective contributes to the body of research (Boyer & Liénard, 2006; Kay, Gaucher, Napier, Callan, & Laurin, 2008; Kay et al., 2010; Keinan, 1994, 2002; Rudski, 2001) demonstrating that one of the functions rituals serve is to make the world seem more comprehensible, certain, and predictable.

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APPENDIX - Experimental Simpatias

Employment In the first day of last quarter phase of the moon, take the milk from a coconut and give it to the unemployed person to drink. After that, ask the person to spit three times in the hole made in the coconut. Following this, light up a brand-new white candle and drop the wax around the hole until the hole is sealed. Take the coconut to a far away beach or river.

Depression For five days, the person with depression should go to a crossroad. While there, the person should say: "Depression, stay here!" The person should not walk through the crossroad for one year.

Infidelity Throw a shoe and a shirt of the unfaithful person into a streaming river unbeknownst to the person. As the river flows away, you say: "I hope the river takes the infidelity away as fast as it can." Take some of the water from the river and keep it somewhere in the house.

Evil-Eye Fill a cup with sand spit inside the cup. Seal the cup and bury it upright before the sunrise.

Lack of Luck Get an orange, peel it, squeeze its juice and bury its flesh. Place the peel on top of the dirt. Drink the juice three times a day (morning, afternoon, and evening).

Lack of Money Collect seven red apples directly from an apple tree. In the morning, before eating anything, peel the apples, eat them and save the peel. Right before going to bed, make a tea with the peel.