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ATTITUDES AND SOCIAL COGNITION

Enacting Rituals to Improve Self-Control

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Rituals are predefined sequences of actions characterized by rigidity and repetition. We propose that enacting ritualized actions can enhance subjective feelings of self-discipline, such that rituals can be harnessed to improve behavioral self-control. We test this hypothesis in 6 experiments. A field experiment showed that engaging in a pre-eating ritual over a 5-day period helped participants reduce calorie intake (Experiment 1). Pairing a ritual with healthy eating behavior increased the likelihood of choosing healthy food in a subsequent decision (Experiment 2), and enacting a ritual before a food choice (i.e., without being integrated into the consumption process) promoted the choice of healthy food over unhealthy food (Experiments 3a and 3b). The positive effect of rituals on self-control held even when a set of ritualized gestures were not explicitly labeled as a ritual, and in other domains of behavioral self-control (i.e., prosocial decision-making; Experiments 4 and 5). Furthermore, Experiments 3a, 3b, 4, and 5 provided evidence for the psychological process underlying the effectiveness of rituals: heightened feelings of self-discipline. Finally, Experiment 5 showed that the absence of a self-control conflict eliminated the effect of rituals on behavior, demonstrating that rituals affect behavioral self-control specifically because they alter responses to self-control conflicts. We conclude by briefly describing the results of a number of additional experiments examining rituals in other self-control domains. Our body of evidence suggests that rituals can have beneficial consequences for self-control.

Keywords: rituals, self-regulation, self-control, health, prosociality

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As "a hallmark virtue of human character" (Prelec & Bodner, 2003, p. 277), self-control refers to the capacity to inhibit prepotent responses that are immediately gratifying but ultimately detrimental, to align short-term behavior with longer-term goals (Baumeister, Bratslavsky, Muraven, & Tice, 1998; Baumeister, Vohs, & Tice, 2007; Carver & Scheier, 1998). Individuals must exercise self-control to accomplish tasks ranging from eating healthily and exercising to behaving prosocially and saving money. However, people generally find exerting self-control to be challenging, and often fail despite their good intentions (Baumeister & Heatherton, 1996; Baumeister, Heatherton, & Tice, 1994; Baumeister et al., 2007; Muraven &

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Baumeister, 2000). Self-control failures have been linked to obesity, smoking, and binge drinking, with economic, health, and social costs for individuals and society (Baumeister, 2002; Baumeister et al., 1994). Interventions that help people to exercise self-control are therefore critical (Patrick & Hagtvedt, 2012).

We propose a simple yet effective tool to help people exercise self-control: engaging in rituals. Anecdotal evidence supports this notion: popular online blogs suggest that rituals can facilitate self-control, offering "A Simple Ritual That Will Make Your Goals 'Stick'" (Reynolds, 2011) and describing "The Power of Ritual: Conquer Procrastination, Time Wasters, and Laziness" (Young, 2015). However, research has not empirically tested the effects of personal rituals on improving self-control. We investigate whether rituals play a causal role in facilitating self-control by randomly assigning individuals to enact rituals in contexts that require self-control—such as healthy eating and prosocial decision-making. Moreover, we document a psychological mechanism that at least in part underlies the effectiveness of rituals. The performance of rituals—characterized by rigidity and repetition—increases feelings of self-discipline; in turn, this heightened sense of self-discipline drives the effect of rituals on self-control.

Theoretical Background

Rituals are pervasive in everyday life. Religious rites, cultural practices, group activities, and personal routines often involve ritualistic elements. Drawing on previous conceptualizations (Legare & Souza, 2012; Rook, 1985; Tambiah, 1979), we define a ritual as a fixed episodic sequence of actions characterized by rigidity and repetition. Although rituals are often viewed as either religious expressions or primitive regressive behavior (Moore & Myerhoff, 1977), rituals in practice take a wide variety of forms, are enacted by individuals and groups in not only religious but also secular settings, and are deployed in situations ranging from consuming food to mourning loved ones (Brooks et al., 2016; Browne, 1980; Hobson, Schroeder, Risen, Xygalatas, & Inzlicht, 2017; Moore & Myerhoff, 1977; Norton & Gino, 2014; Romanoff, 1998; Rook, 1985; Turner, 1969; Vohs, Wang, Gino, & Norton, 2013).

Rituals have been linked to a wide variety of beneficial outcomes. Collective rituals promote social integration and group solidarity (Baumeister & Leary, 1995; Durkheim, 1912/1995; Goethals, 1996), facilitate the transmission and reinforcement of social norms (Rossano, 2012), and align individuals' belief systems with those of society (Davis-Floyd, 1996). Moreover, an emerging stream of research documents the causal impact of rituals on a variety of intrapersonal psychological and behavioral consequences, including enhanced consumption experiences (Vohs et al., 2013), mitigated grief over loss (Norton & Gino, 2014), and reduced anxiety and improved performance (Brooks et al., 2016).

We suggest that rituals can also facilitate the exertion of self-control. A large body of research suggests a general link between rituals and control, broadly defined: rituals are perceived as rendering order and stability, particularly in times of chaos (Romanoff, 1998; Turner, 1969), and superstitious rituals are often enacted with the purpose of restoring a sense of agency and control (Bleak & Frederick, 1998; Burger & Lynn, 2005; Keinan, 2002; Souza & Legare, 2011). Personal mourning rituals can help individuals regain feelings of control after losses (Norton & Gino, 2014), and religious rituals have been linked to increased perceptions of control, including strengthening and instilling willpower for the achievement of virtuous goals (Ahler & Tamney, 1964; Anastasi & Newberg, 2008; Hamayon, 2012; Kehoe, 1970; Woods & Lamond, 2011). The reverse link is evident as well: people behave in more rigid and patterned ways after their sense of control has been diminished (Lang, Krátký, Shaver, Jerotijević, & Xygalatas, 2015; Whitson & Galinsky, 2008).

Why might rituals increase self-control? People often infer their own attitudes, emotions, and other internal states from the observation of their own behavior (Ariely & Norton, 2008; Bem, 1972). This psychological process also applies to rituals: when arbitrary sequences of behaviors lack apparent instrumentality, people adopt a *ritual stance* toward them, imbuing them with meaning (Kapitány & Nielsen, 2015; Legare & Souza, 2012). Relatedly, we propose that enacting the rigidity and repetition inherent to rituals (Boyer & Liénard, 2006; Rook, 1985; Tambiah, 1979)—and observing oneself do so—can signal self-discipline to the performer. Ainslie (1975) links behavioral rigidity to the exercise of self-control, and, as facets of the overall construct of conscientiousness, traits such as dutifulness (adherence to strict standards) and self-discipline (the ability to persist on tasks) have similarly been linked to behavioral inhibition and self-control (Costa, McCrae, & Dye, 1991).

Further evidence in support of this conjecture comes from research on consumption. Repeated family dinner rituals (e.g., remaining at the table until everyone has finished eating) are negatively correlated with family BMI (Body Mass Index; Wansink & Van Kleef, 2014), and successful (albeit unhealthy) efforts to exert excessive self-control over food intake are linked to rigid and repetitive pre-eating rituals (Halmi et al., 2000), again suggesting that rituals might serve a self-regulatory function. Critically, self-discipline has been associated with a range of positive outcomes requiring self-control (e.g., academic success; Duckworth & Seligman, 2005, 2006; Waschull, 2005). As a result, we suggest that enacting rigid, repetitive ritualistic behaviors leads to increased feelings of self-discipline, and that these subjective feelings of self-discipline can in turn increase behavioral self-control.

The Present Research

Although prior findings suggest the possibility of a link between rituals and self-control, these are primarily correlational in nature. The present research examines whether—and through what mechanism—rituals exert a causal impact on effective self-control. We present evidence from six experiments designed to test our account that rituals improve self-control by heightening feelings of self-discipline. Moreover, we assess several potential alternative explanations for the efficacy of rituals. Across the experiments, we design and utilize rituals characterized by rigidity and repetition to compare the effect of enacting rituals to performing comparable nonritualized actions—or doing nothing.

Experiment 1 is a field experiment designed to test the effect of rituals on a common self-control problem—eating less—in which participants attempted to reduce their calorie intake over a 5-day period. Experiment 2 examines the effect of ritual engagement on a food choice that posed a self-control dilemma and investigates

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whether the effect is specific to ritualized (as opposed to random) actions. Experiments 3a and 3b distinguish the effect of rituals from habits and provide initial evidence for the psychological process—feelings of self-discipline—proposed to underlie the effect of rituals on self-control behaviors. These experiments also address potential alternative mechanisms such as lower decision difficulty, greater involvement or enjoyment, and more positive affect. Experiments 4 and 5 assess the effect of rituals in another self-control context—prosocial decision-making—and provide further evidence for the mediating role of self-discipline. Experiment 5 also identifies a boundary condition for the effect, namely that rituals are no longer influential in the absence of a self-control conflict.

Across the studies, we report all variables collected and all conditions included in the study designs. No participants who completed our studies were excluded from the analyses unless otherwise noted for reasons identified before conducting the research.

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Experiment 1: Weight Loss

To test our hypothesis that rituals can improve self-control, we first examined the effect of enacting rituals on a pervasive and consequential self-control problem—unhealthy food consumption—in a longitudinal field setting. Obesity is an increasing concern in the United States: as of 2014, more than one third (37.7%) of American adults qualified as obese (Flegal, Kruszon-Moran, Carroll, Fryar, & Ogden, 2016). We recruited undergraduate women at a gym who had the goal to lose weight. All participants received the same instructions to try to reduce their calorie intake over a 5-day period, but half were told to be "mindful" about their food consumption, whereas the other half were taught a pre-eating ritual to remind them to reduce calorie intake. We created the ritual for Experiment 1 to fit our theoretical definition of a ritual: a fixed sequence of behaviors characterized by repetition and rigidity. The ritual itself did not require participants to eat less food; because it was a pre-eating ritual, it did not directly interfere with consumption. We predicted that those who paired a ritual with food consumption would reduce their calorie intake more that those who were merely mindful.

Method

Participants. Because we did not know what effect size to expect, we planned to recruit as many participants as possible over the course of one summer at a gym at a college in the Midwestern United States. There were three requirements to participate in the study. First, we required participants to be female, both to reduce variance in participants' daily food intake and because college-age women tend to be more concerned with weight-loss goals than college-age men (Anderson, Lundgren, Shapiro, & Paulosky, 2003). Second, we required participants to have a weight-loss goal to include only individuals who cared about the goal, would seriously try to follow our instructions, and would stay in the study for all 5 days. Finally, we required participants to own a smartphone so that they would be able to report their daily calories through a phone application. In total, 93 women (M_{Age} = 23.6 years, SD = 5.2, M_{Weight} = 147.6 pounds, SD = 25.4, M_{Height} = 65.4 in., SD = 2.9) enrolled in the experiment in exchange for a $5 Starbucks gift card immediately upon entry, with the promise of another $5 gift card upon completion of all parts of the study.

Procedure. We randomly assigned participants to one of two conditions: ritual or mindful eating (control) condition. Upon agreeing to participate, participants signed a consent form. We collected participants' names, e-mail addresses, and phone numbers on a separate sheet. We explained to participants that we would call them if we did not receive their survey response by the week's end.

At enrollment, participants completed Survey 1 in which they reported the following: their age, estimated body weight (in pounds), estimated height (in feet and inches), and estimated average daily calorie consumption (in kcals). They reported: (a) How likely is it that you will be able to cut your calories by 10% for the next 5 days? (1 = *not at all likely*, 7 = *very likely*); (b) How important to you is your goal to lose weight? (1 = *not at all important*, 7 = *very important*); and (c) How happy are you with your current body image? (1 = *not at all happy*, 7 = *very happy*).

Next, participants downloaded an application called "MyFitnessPal" onto their phone. The application allowed participants to track their daily food and beverage intake, and their exercise. MyFitnessPal allows users to list exactly the type and amount of food or beverage they consumed; the user can search for the exact brand of a product from the grocery store or a specific meal ordered from a chain restaurant. Users have the choice to list individual foods separately (e.g., breakfast consisted of 1 egg, 1 tbs. butter, 1 cup of spinach, and 1 onion), or to use preprogrammed meals that MyFitnessPal or other users have already inputted (i.e., breakfast consisted of 5 oz. of a spinach and onion omelet). We required participants to add the experimenter as a "friend" and set their food diary settings to "Friends only," thereby giving the experimenter access to their online food diaries. Participants set reminders three times per day that would ring or vibrate to remind them to log their food intake. The experimenter showed participants how to complete the food diary. The experimenter also recorded participants' usernames so that we could match their food diaries to their data for the rest of the study.

Next, participants received the instructions for the study. All participants received these instructions:

> For the purpose of the study, please try to reduce your typical food consumption for the next five days. Try to cut the number of calories you consume by about 10% if you can.[1] We will track the number of calories you consume and burn for the next five days.

In the mindful eating (control) condition, we then told participants, "In order to help you cut your calories, please try to be mindful about what you eat this week. Every time you eat, please try to pause and think carefully about what you are eating." We designed this condition to control for the amount of attention that participants paid to their eating behaviors.

In the ritual condition, we instead told participants,

> In order to help you to cut your calories, please complete a ritual every time that you eat in the next five days. This pre-eating ritual has three steps. First, cut your food into pieces before you eat it. Second, rearrange the pieces so that they are perfectly symmetric on your

[1] We arbitrarily selected 10% to encourage participants to reduce their food consumption as drastically as possible.

plate. That is, get the right half of your plate to look exactly the same as the left half of your plate. Finally, press your eating utensil against the top of your food three times. In order to be in the study, you must do the three steps of this ritual each time you eat. The ritual will remind you to reduce your food consumption.

To ensure understanding, participants repeated the steps of the ritual to the experimenter.

All participants received an "instruction" card (see Figures 1 and 2) that was the size of a business card. Printed on this card were the instructions for their experimental condition.[2] Participants then signed a final sheet promising that they would adhere to the study instructions.

After 5 days, we emailed an online survey to participants. Participants first recorded their MyFitnessPal username. Next, they reported: (a) "How happy did you feel with your eating habits this past week?" (1 = *not at all happy*, 7 = *very happy*); (b) "How successful do you think you were in cutting calories by 10% this week?" (1 = *not at all successful*, 7 = *very successful*); (3) "How important to you is your goal to lose weight?" (1 = *not at all important*, 7 = *very important*); and (d) "How happy are you with your current body image?" (1 = *not at all happy*, 7 = *very happy*). The survey asked participants whether or not they completed a ritual before eating and, if so, to describe the steps of the ritual. It asked, "How do you think this ritual affected your eating habits this week?" (with a blank response box), whether they believed the ritual helped them cut calories (1 = *not at all helpful*, 7 = *very helpful*), and whether they planned to continue the ritual (1 = *not at all likely*, 7 = *very likely*). The survey asked all participants to estimate their daily average calorie consumption over the past 5 days, to estimate their body weight in pounds, and to report "how carefully you logged your food intake throughout the week (1 = *not at all carefully*, 7 = *very carefully*). Finally, the survey asked participants: "If you missed logging any meals, please tell us what you missed and why below. (Please be honest; you will not be penalized at all for your response!)" (with a blank response box). Participants were debriefed on the last page of the survey.

Results

Attrition. Of the 93 participants who originally enrolled (47 in control condition, 46 in ritual condition), 85 (91.4%: 45 in control condition, 40 in ritual condition) completed the final survey and logged their food intake for at least two full days. Therefore, we removed eight participants from the sample for not completing enough of the study to analyze. The response rate was not significantly different between conditions, χ^2 (n = 93) = 2.28, p = .131.

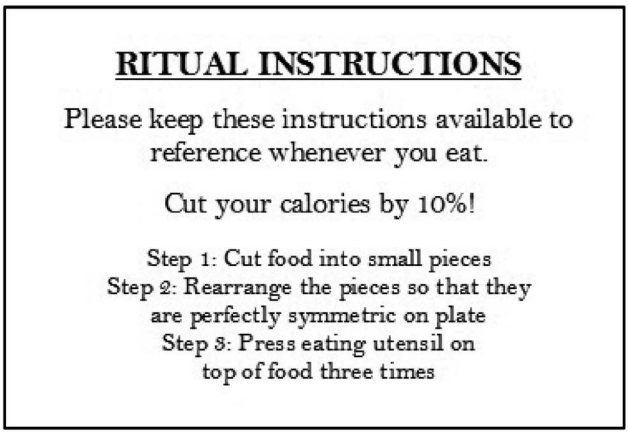

Figure 1. "Instruction" card in the ritual condition (Experiment 1).

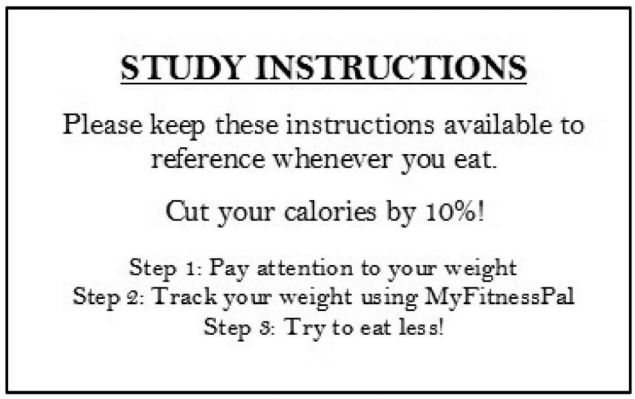

Figure 2. "Instruction" card in the control condition (Experiment 1).

Food consumption. We removed any food diaries that were clearly incomplete. Of the 85 participants, 84 completed the Day 1 diary, 81 completed the Day 2 diary, 83 completed Day 3, 76 completed Day 4, and 67 completed Day 5 (n = 391 total diaries). As such, there was significant attrition across days: fewer participants completed their diary on Day 5 compared with Day 1 in both the ritual condition (Day 1 = 40/40, Day 5 = 33/40) and the control condition (Day 1 = 44/45, Day 5 = 34/45), zs = 2.77 and 3.10, ps = .006 and .002. We derived the following data from the food diaries: the number of calories consumed each day (kcal), the number of calories burned (from exercise, kcal), the amount of fat consumed (g), and the amount of sugar consumed (g).

Participants reported consuming fewer calories in the ritual condition (averaging consumption across all 391 available food diaries; M = 1424.26, SD = 224.92) than in the control condition (M = 1648.12, SD = 389.27), $t(83) = 3.19$, p = .002, d = .70, but did not burn fewer calories (M_{Ritual} = 270.05, SD = 232.77 vs. $M_{Control}$ = 234.18, SD = 344.34), $t(83) < 1$. Consistent with this, participants in the ritual condition reported consuming less fat and sugar (Ms = 50.10 and 53.32, SDs = 13.32 and 24.51, respectively) than those in the control condition (Ms = 60.12 and 66.61, SDs = 20.89 and 28.85, respectively), ts(83) = 2.61 and 2.27, ps = .011 and .026, ds = 0.57 and 0.50. Fat and sugar consumption were positively correlated with the number of calories consumed, rs = 0.75 and 0.65, ps < .001. These data indicate that enacting the pre-eating ritual caused participants to report consuming fewer calories, implying that the ritual aided them in exercising self-control to achieve their weight loss goals.

To examine the pattern of consumption across days, we conducted a 5 (days) × 2 (experimental condition: ritual vs. control)

[2] Some participants had subsequent questions about how to perform the ritual in various cases, such as if they were eating soup, were not using an eating utensil, or were in a social setting. We created scripted responses to each of these questions in which we told participants that they could revise the ritual by removing or adjusting a single step but that they must still try to perform the ritual to the best of their ability.

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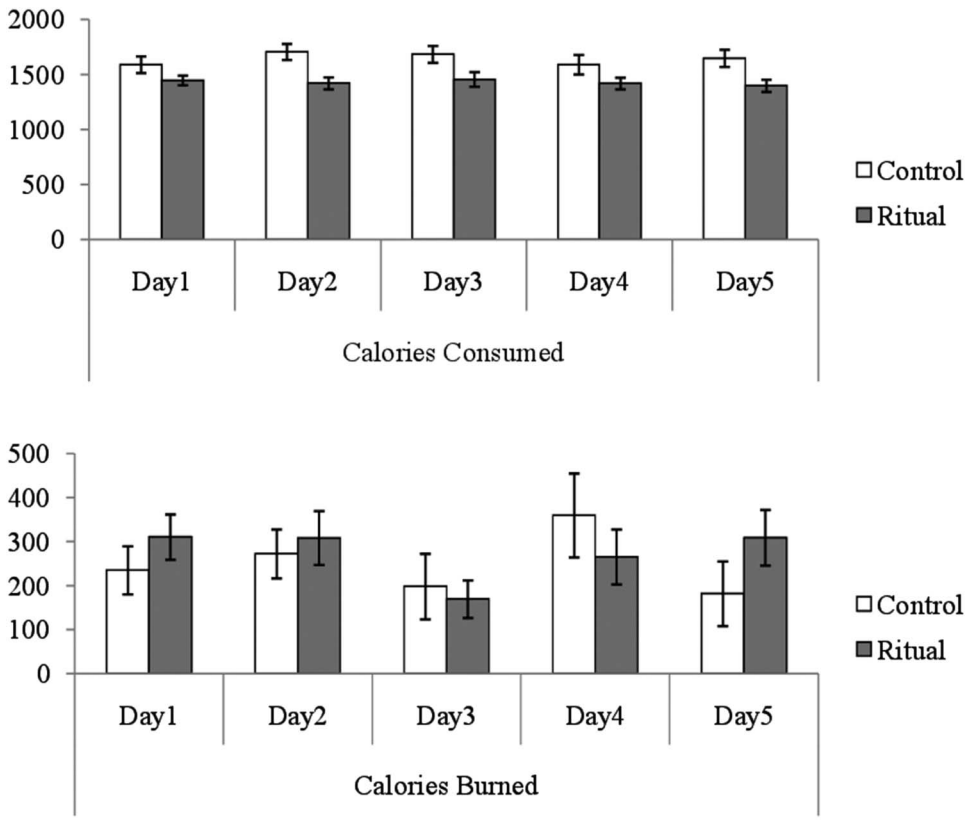

Figure 3. Calories consumed and calories burned across each of all 5 days as a function of ritual condition (Experiment 1). Error bars represent *SEM*.

mixed-model analysis of variance (ANOVA) on calories consumed and calories burned (see Figure 3). This analysis only included participants who completed their food diary for all 5 days ($n = 33$ in control condition, $n = 30$ in ritual condition). Consistent with the results above, there was an effect of experimental condition on calories consumed, $F(1, 61) = 10.02$, $p = .002$, $\eta_p^2 = 0.14$, but not on calories burned, $F(1, 61) < 1$. There was no effect of days on calories consumed, $F(4, 61) < 1$, but a marginal effect on calories burned, $F(4, 61) = 2.01$, $p = .093$, $\eta_p^2 = 0.03$; this effect on calories burned was not linear, $F(1, 61) < 1$. Finally, there were no interactions, $Fs(1, 61) < 1.24$, $ps > .270$, suggesting no systematic difference in consumption over time between the conditions.

Survey responses. As expected given random assignment, there were no differences across conditions in participants' BMI before the study started, their perceived likelihood of cutting calories by 10%, their goal importance, or their body image happiness, $ts < 1.42$, $ps > .158$. In a linear regression that controlled for age, weight, height, perceived likelihood of cutting calories, goal importance, and body image happiness before the experiment started, experimental condition continued to predict average calories consumed, $\beta = -0.32$, $p = .003$ (see Table 1).[3]

By the end of the 5 days, participants in the ritual condition reported feeling marginally happier with their eating habits and more successful in meeting their goals (Ms = 4.90 and 5.05, SDs = 1.34 and 1.55) than those in the control condition (Ms = 4.36 and 4.38, SDs = 1.40 and 1.47), $ts(83) = 1.83$ and 2.05, $ps = .071$ and .043, $ds = 0.40$ and 0.45, respectively. There were no differences by condition for how happy participants were with their body image ($M_{Ritual} = 4.53$, $SD = 1.15$, $M_{Control} = 4.27$, $SD = 1.25$), how important their goal was to lose weight ($M_{Ritual} = 5.00$, $SD = 1.43$, $M_{Control} = 5.04$, $SD = 1.40$) or how carefully they logged their food intake ($M_{Ritual} = 5.74$, $SD = 0.99$, $M_{Control} = 5.56$, $SD = 1.10$), $ts < 1$ (see Figure 4).

There was no difference in the change in body image happiness or goal importance from the first to last survey in the ritual condition (Ms = −0.05 and 0.30, SDs = 1.08 and 1.32) compared with the control condition (Ms = −0.27 and 0.00, SDs = 0.81 and 1.19), $ts(83) = 1.10$ and 1.05, $ps > .274$ (see Figure 4). However, body image happiness significantly decreased in the control con-

[3] In this regression, age and body image also marginally positively predicted number of calories consumed, βs = 0.19 and 0.20, $ps = .073$ and .062, respectively. Surprisingly, body weight did not predict calories consumed, but we note that weight and height were self-reported and, therefore, these measures are subject to social desirability concerns. We examined the raw correlations between these presurvey variables and calories consumed: age, weight, and height were positively correlated with calories consumed, $rs = 0.22$, 0.20, and 0.27, $ps = .049$, .061, and .014, respectively, but the other presurvey measures did not correlate with calories consumed. We also examined whether any presurvey measures correlated with calories burned: only the perceived likelihood of cutting calories correlated with number of calories actually burned, $r = 0.23$, $p = .034$.

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Table 1
Results of Regression Analysis on Average Calories Consumed Over 5 Days (Experiment 1)

Predictor	*b*	*SE*	β	*t*	*p*
Age	12.42	6.83	.19	1.82	.073
Weight	1.70	1.82	.12	.93	.354
Height	11.84	15.30	.10	.77	.441
Perceived likelihood of cutting calories	−7.95	24.14	−.04	−.33	.743
Goal importance	−24.02	27.75	−.10	−.87	.389
Body image happiness	63.89	33.68	.20	1.90	.062
Ritual (0 = control, 1 = ritual)	−213.61	69.52	−.32	−3.07	.003

Note. Dependent variable: Average calories consumed over 5 days.

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dition, one-sample *t* test compared with 0: $t(44) = -2.21$, $p = .032$, but not in the ritual condition, one-sample $t(39) = -0.29$, $p = .772$, suggesting rituals may provide at least some buffer against unhappiness.

Finally, we examined beliefs about the ritual from the participants in the ritual condition; 100% of these participants correctly recalled the three steps of the ritual. Despite the effectiveness of rituals, participants tended to think the ritual was not very helpful ($M = 2.84$, $SD = 1.39$), significantly less than 4 on the 7-point scale, $t(37) = -5.31$, $p < .001$, and reported being unlikely to continue it ($M = 1.70$, $SD = 1.20$).

Discussion

Experiment 1 provides initial evidence for our proposition that rituals boost self-control. Participants who enacted a pre-eating ritual reported significantly lower calorie consumption than those who attempted to be mindful about what they ate, indicating that the effect of ritual on self-control goes above and beyond the effect of mindfulness about one's behavior. Results also suggest that the effect of rituals on calorie consumption is not driven by changes in perceived goal importance or happiness with body image.

Of course, there are several alternative explanations for why the pre-eating ritual reduced food consumption in this study. For instance, enacting pre-eating rituals may have been embarrassing, leading participants to eat less socially, or may have been arduous, making the eating experience less enjoyable. The ritual may also have made the food seem less appealing; cutting food into little pieces and rearranging it on the plate might reduce the positive, tempting, palatable appearance of food. Moreover, it is also possible that participants who were told to enact rituals only reported consuming fewer calories because they felt guiltier about their calorie consumption. Therefore, we turned to the laboratory in our next studies to exert greater experimental control in assessing how rituals improve behavioral self-control.

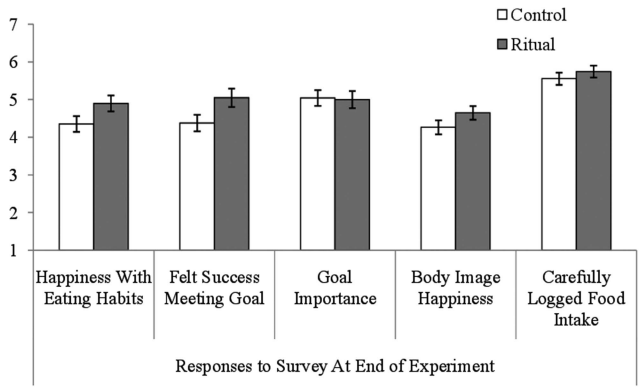

Figure 4. Control measures collected in survey at end of experiment, as a function of ritual condition (Experiment 1). Error bars represent *SEM*.

Experiment 2: Healthy Eating

Experiment 2 had two primary goals. First, it provides a conceptual replication of the positive effect of rituals on self-control, using a different ritual and a choice measure of self-control in a healthy eating setting. Second, it examines whether rituals are uniquely effective for facilitating self-control, above and beyond any type of action paired with a goal-relevant behavior: we added a random gestures control condition that involved similar physical gestures as the ritual, but that varied each time they were enacted such that they did not form a repeated ritualistic script. Prior research has demonstrated that engaging in behaviors that are considered part of a ritual leads to more powerful effects than engaging in the same actions when they are considered random (Brooks et al., 2016; Vohs et al., 2013): behaviors feel more ritualistic when they are represented as part of a ritual. Furthermore, to avoid potential demand effects, we did not convey any information to participants that the ritual could improve self-control.

We paired a ritual with a healthy eating task for individuals who had the goal to be healthy. After two rounds of consuming a healthy food (carrots) along with enacting a ritual, we gave participants the choice to consume a desirable but unhealthy food (chocolate truffles)—or to eat another carrot. We predicted those who had enacted (and continued to enact) the ritual would be more likely to make the choice that was consistent with their health goals: in this case, the carrot.

Method

Participants. Based on our effect sizes in Experiment 1, we expected that we would need at least 50 participants per condition in this study. Because the paradigm in Experiment 2 differs from Experiment 1, we preferred a larger sample size and, therefore, aimed for about 70 participants per condition (210 participants total in three conditions). We recruited adults on the e-mail list of a participant pool at a Midwestern University. Adults were only allowed to participate if they reported (a) liking chocolate and (b)

a goal to eat healthy. After this screening, 198 adults (M_{age} = 23.96, SD = 7.31; 80 men) participated in exchange for $3.

Procedure. Participants learned they would be completing a taste test of carrots and chocolate. They rated their current hunger level (0 = *none*, 10 = *a lot*). They received four bags from the experimenter: three each with a baby carrot inside, and one with a highly desirable Lindt chocolate truffle inside. The experimenter placed the bags next to the participant's computer and told the participant to start the survey on the computer in front of him or her.

The study design entailed three conditions (between-participants): ritual, random gestures, and control. We adapted the ritual and random gestures procedures from Vohs et al. (2013), who pretested these steps and found that the steps in the ritual condition felt more ritualistic than those in the random gestures condition. In the ritual and random gestures conditions, participants completed an initial set of steps, ate the first carrot, completed a second set of steps, ate the second carrot, completed a final set of steps in anticipation of eating the third carrot, answered two questions about eating the third carrot, and finally learned they had a choice between eating a carrot or a chocolate. In the control condition, participants simply ate the first two carrots and then answered the same two questions and were given the final choice, without performing any additional steps.

Participants in the ritual condition completed exactly the same set of steps three times in a row (displayed below). The steps were described as "your carrot-eating ritual, which you must always do before eating carrots. It is important that you do each step exactly the same every time that you eat a carrot." We did not provide any further explanation to participants about why they needed to perform a carrot-eating ritual, but ensured by observing them in the laboratory that all participants completed the gestures as required.

1. Make a fist with your right hand. Using your knuckles, knock on the table twice.
2. Now, take out the first [second] [third] plastic bag and put it in front of you.
3. Then, use your right hand and knock twice again on the table.
4. Now, take a deep breath and close your eyes for 2 s.

Participants in the random-gestures condition completed a different set of steps each time (displayed below). The steps were described as "specific steps" (e.g., "Please follow the specific steps before you taste the carrot"). As a cover story for why participants needed to follow these steps, we told participants that we were piloting these behaviors for a different study. We again observed participants to ensure they were following instructions.

1. Make a fist with your right hand. Using your knuckles, knock on the table twice.
2. Now, take out the first plastic bag and put it in front of you.
3. Then, use your right hand and knock twice again on the table.
4. Now, take a deep breath and close your eyes for 2 s.
5. Now, take out the second plastic bag and put it in front of you.
6. Now, please turn around the room, from the left wall to the right wall.
7. Then, use your left hand, snap once.
8. Now, use your left hand, curl the fingers of your hand.
9. Use your right hand, shake it back and forth four times.
10. Now, take out the third plastic bag and put it in front of you.
11. Use your left hand, open and close your hand into a fist three times.

Just before learning that they had a choice to eat the carrot or the chocolate, participants believed they would be eating the third carrot and completed the following two questions: (a) How much do you anticipate enjoying the last carrot? (1 = *no enjoyment*, 7 = *extreme enjoyment*), and (b) How much do you want to have the last carrot? (1 = *not at all*, 7 = *very much*). The next page of the survey read: "You can eat the last carrot or you can eat the chocolate instead. You can only choose ONE item. You will return the other item to the experimenter. If you eat the carrot, you may not eat the chocolate. If you eat the chocolate, you may not eat the carrot. Make your choice now."

After participants made their choice, we measured two exploratory variables we thought might be affected by enacting a ritual: how happy participants felt about their choice (1 = *not at all happy*, 7 = *very happy*) and how much they personally cared about eating healthy foods like carrots (1 = *do not at all care*, 7 = *very much care*). Finally, we asked participants two questions to control for individual variance in their predilections for carrots and chocolate: how much they generally like eating carrots and chocolate (1 = *not at all*, 7 = *very much*).

Results

Choice. The results of a χ^2 test revealed that experimental condition significantly affected participants' food choices, χ^2 (n = 198) = 7.30, p = .026. Specifically, participants who enacted a ritual were more likely to choose the carrot (M = 58.2%, SD = 0.50) than were participants who did nothing (M = 34.8%, SD = 0.48), χ^2 (n = 198) = 7.29, p = .007, but not statistically significantly more likely than were participants who performed random gestures (M = 46.2%, SD = 0.50), χ^2 (n = 198) = 1.92, p = .166 (see Figure 5). The choice share did not vary between the control and random condition (p = .187). Given that we expected no difference between the control and random condition, we combined these two conditions and reran the analysis. Compared with those in the control and random conditions (40.5%), more participants in the ritual condition chose virtue (carrot, 58.2%) over vice (chocolate), χ^2 (n = 198) = 5.62, p = .018.

To control for other obvious predictors of participants' food choices beyond experimental condition, we further conducted a logistic regression analysis using choice (0 = chocolate, 1 = carrot) as the dependent variable and the following independent

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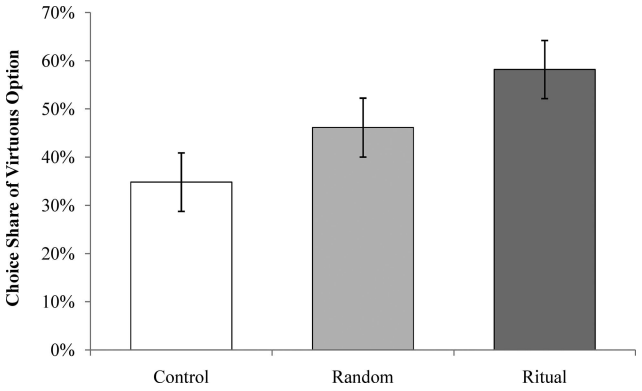

Figure 5. Choice share of virtuous option (carrot) as a function of ritual condition (Experiment 2). Error bars represent *SEM*.

variables: (a) a dummy variable for whether participants enacted a ritual (0 = control, 0 = random, 1 = ritual); (b) a dummy variable for whether participants performed any (random or ritualized) gestures (0 = control, 1 = random, 1 = ritual); (c) participants' initial hunger; (d) their overall liking for carrots; and (e) their overall liking for chocolate. Results revealed a marginally significant effect of the ritual dummy, $b = .80$, $p = .05$, 95% confidence interval (CI) for odds ratio (*OR*) [1.000, 4.951]. The gesture dummy was nonsignificant ($p = .538$), suggesting that this effect is specific to ritualized gestures rather than any gestures. Participants' overall liking for carrots ($p < .001$) and for chocolate ($p < .001$) predicted choice, whereas initial hunger did not ($p > .60$).

Self-reports. We combined the two measures of wanting and anticipating into a single index of anticipation, $r = .85$, $p < .001$. In a one-way ANOVA of experimental condition on this index, condition marginally affected anticipation, $F(2, 197) = 2.79$, $p = .064$. Decomposing the effect of condition on anticipation, participants who enacted a ritual reported greater anticipation ($M = 4.71$, $SD = 1.76$) than those who performed random gestures ($M = 3.98$, $SD = 1.87$), $t(195) = 2.32$, $p = .021$, but not those who did nothing ($M = 4.23$, $SD = 1.80$), $t(195) = 1.53$, $p = .127$. Neither of these results changed after controlling for hunger, liking for carrots, and liking for chocolate: $\beta = 0.13$, $p = .042$ and $\beta = 0.09$, $p = .125$, respectively. Experimental condition did not affect happiness with choice or caring about the goal to eat healthy, Fs < 1.

Discussion

Participants who enacted a ritual while eating carrots subsequently made healthier choices—they were more likely to eat another healthy carrot rather than an unhealthy chocolate—compared with individuals who performed no actions and, albeit with a much smaller effect size, compared with those who performed random actions. These findings cannot be simply attributed to demand effects: participants in this experiment were not informed that engaging in the ritual could increase self-control.

Experiments 3a and 3b: Food Choice

Experiments 3a and 3b had two objectives. First, we sought to empirically differentiate the effects of rituals from those of a related construct: habits. In Experiment 2, participants practiced two rounds of eating a carrot paired with a ritual before the opportunity to choose between a third carrot and chocolate; these first two practice rounds may have instituted a "carrot-eating habit." Indeed, Wood and Neal (2007) write that "[h]abits typically are the residue of past goal pursuit; they arise when people repeatedly use a particular behavioral means in particular contexts to pursue their goals" and that the "associative learning underlying habits is characterized by the slow, incremental accrual of information over time in procedural memory." In Experiments 3a and 3b, we removed practice rounds in which a ritual is paired with a self-control choice to eliminate the opportunity for associative learning. Thus, participants repeat the steps of the ritual multiple times to create a rigid, repetitive script, but the ritual is not paired with self-control behavior before the critical choice. We predicted that a ritual enacted for the first time in a self-control context—and, therefore, clearly before the formation of a self-control habit—would increase self-control.

Furthermore, we designed these experiments to directly investigate the psychological process underlying the benefits of rituals for self-control. According to our theoretical framework, rituals promote self-control by increasing subjective feelings of self-discipline: we added a self-reported measure of feelings of self-discipline to test this hypothesis. As in Experiment 2, we again included a "random gestures" (i.e., nonritual) condition to test our conjecture that feelings of self-discipline arise specifically when enacting ritualized gestures. We predicted that enacting a ritual (vs. random gestures or doing nothing) would promote self-control by heightening feelings of self-discipline. In Experiments 3a and 3b, we examined the causal relationship between enacting a ritual and self-control in a food choice context where participants chose between a healthy food (Odwalla bar) and an unhealthy food (Snickers bar). As a replication of Experiment 3a, Experiment 3b was a preregistered study on Open Science Framework (see https://osf.io/tcxha/).

Pretest. We conducted a pretest to demonstrate that this food decision required self-control. Participants from Amazon Mechanical Turk took part only if they reported that they (a) had a goal of achieving and maintaining good health, (b) liked chocolate, and (c) ate health bars. After this screening, 96 MTurk participants from across the United States completed our pretest ($M_{age} = 33.70$, $SD = 10.46$; 46 women). Specifically, we presented participants with nutritional information for the two bars along with pictures. Participants indicated the extent to which they agreed that choosing the Odwalla bar required more self-control than choosing the Snickers bar (1 = *strongly disagree*, 9 = *strongly agree*). They also reported the extent to which the two bars are healthy (1 = *not at all healthy*, 9 = *very healthy*), tempting (1 = *not at all tempting*, 9 = *very tempting*), and tasty (1 = *not at all tasty*, 9 = *very tasty*). Participants' rating of the extent to which choosing the Odwalla bar required greater self-control than choosing the Snickers bar was significantly higher than the midpoint of the scale ($M = 6.39$, $SD = 2.47$), $t(95) = 5.50$, $p < .001$. Moreover, compared with the Odwalla bar, the Snickers bar was perceived as less healthy ($M_{Snickers} = 2.74$, $SD = 2.05$ vs. $M_{Odwalla} = 7.13$, $SD = 1.56$), $F(1, 190) = 277.97$, $p < .001$, more tempting ($M_{Snickers} = 7.44$, $SD = 1.95$ vs. $M_{Odwalla} = 5.44$, $SD = 2.13$), $F(1, 190) = 46.10$, $p < .001$, and tastier ($M_{Snickers} = 7.73$, $SD = 1.69$ vs. $M_{Odwalla} = 6.05$, $SD = 1.79$), $F(1, 190) = 44.56$, $p <$

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.001. Overall, these results support the claim that this choice task involves self-control.

Experiment 3a

Method.

Participants. Based on the effect size in Experiment 2, we predetermined a sample size of at least 80 participants per experimental condition. We allowed individuals to participate in this study if they reported that they (a) had a goal of achieving and maintaining good health, (b) liked chocolate, (c) ate health bars, and (d) passed an attention check. Because we expected that these restrictions might limit participation, we recruited more participants than our preferred sample size. After this screening, 276 MTurk participants from across the United States (M_{age} = 34.67, SD = 10.89; 152 women) completed this study in exchange for $0.75.

Procedure. We randomly assigned participants to one of three conditions (ritual vs. random gestures vs. control). All participants were informed that they would make a real choice about which food they would like to consume and that 10% of participants would actually receive their choice.[4] Then, we presented participants across conditions with pictures of the two bars (i.e., Snickers bar and Odwalla bar) and their nutritional information.

In the ritual condition, participants performed a set of ritualized gestures twice in a row before making their choice:

- Sit upright
- Put your hands on your knees
- Take a deep breath
- Close your eyes
- Bow your head
- Silently count to exactly 10 (one number per second)
- Then, open your eyes

In contrast, in the random condition, participants performed two sets of random, nonritualized gestures before making their choice, in any order they wanted:

- Sit normally
- Place a hand on your belly
- Cough
- Blink your eyes
- Shake your head
- Look at the space key on your keyboard just for a few seconds
- Wink

They then performed a different set of gestures in any order they wanted:

- Touch your finger to your nose
- Slouch in your seat
- Look around
- Keep your legs crossed just for a few seconds
- Breathe in-and-out
- Squeeze your eyes shut
- Move your head

We created these gestures to match the ritual condition in terms of the total number of behaviors and types of behaviors (e.g., one gesture involving touching, one gesture involving breath, one gesture involving eyes, etc.). In contrast to the ritual condition, these gestures did not contain ritualistic elements of repetitiveness and rigidity.

In the control condition, participants did not perform any gestures and simply chose between the Snickers bar (vice) and the Odwalla bar (virtue). Next, they paused for 40 s before proceeding to ensure that they spent relatively the same amount of time overall on the study as participants in the other two conditions.

All participants then reported their subjective feelings of self-discipline while making their food decision ("I felt disciplined when making this decision," "I felt like my willpower was gone when making this decision (reverse-scored)," "I felt mentally strong when making this decision," "I felt sharp and focused when making this decision," 1 = *strongly disagree*, 9 = *strongly agree*; adapted from Ciarocco, Twenge, Muraven, & Tice, 2007).

It is possible that after enacting a ritual, participants perceived their health goal as more important, were more involved in this decision making, enjoyed the decision more, perceived the decision as less difficult, or experienced more positive affect, thereby resulting in greater self-control. To address these potential alternative explanations, participants reported the perceived importance of their health goal, decision involvement, decision enjoyment, decision difficulty, and general affect, which all were single-item measures on a 9-point scale (1 = *not at all*, 9 = *very much*).

To examine the effectiveness of the ritual manipulation, we included four manipulation check items for participants in the ritual and random conditions: (a) to what extent did the gestures you performed feel like a ritual? (1 = *not at all*, 9 = *a great deal*); (b) how repetitive were the gestures you performed? (1 = *not at all repetitive*, 9 = *very repetitive*); (c) how rigid were the gestures you performed? (1 = *not at all rigid*, 9 = *very rigid*); (d) how meaningful or significant were the gestures you performed? (1 = *not at all meaningful/significant*, 9 = *very meaningful/significant*). Finally, participants reported their overall liking for Snickers bar and Odwalla bar (1 = *not at all*, 9 = *very much*), hunger (1 = *not at all hungry*, 9 = *very hungry*), as well as demographic information about their gender and age.

Results.

Manipulation checks. As expected, results of one-way ANOVAs revealed that, compared with random gestures, ritualized gestures were perceived to be more like a ritual (M_{ritual} = 6.00, SD = 2.43 vs. M_{random} = 4.34, SD = 2.91), $F(1, 183) = 17.68$, $p < .001$, more repetitive (M_{ritual} = 6.46, SD = 1.99 vs. M_{random} = 4.08, SD = 2.43), $F(1, 183) = 53.01$, $p < .001$, more rigid (M_{ritual} = 5.00, SD = 2.13 vs. M_{random} = 3.52, SD = 2.35), $F(1, 183) = 20.23$, $p < .001$, and more meaningful (M_{ritual} = 4.95, SD = 2.31 vs. M_{random} = 2.97, SD = 2.06), $F(1, 183) = 37.81$, $p < .001$. These results confirmed the effectiveness of the ritual manipulation.

Choice. To test our primary hypothesis, we conducted a logistic regression analysis using choice (0 = Snickers bar, 1 = Odwalla bar) as the dependent variable and the following independent variables: (a) a dummy variable for whether participants enacted a ritual (0 = control, 0 = random, 1 = ritual), and (b) a dummy variable for whether participants performed any (random

[4] Participants who were randomly chosen to receive their choice were actually given an Amazon eGift Card and were directed to a link for the product they chose.

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or ritualized) gestures (0 = control, 1 = random, 1 = ritual). As anticipated, results revealed a significant effect of the ritual dummy, $b = .65$, $\chi^2(n = 276) = 4.62$, $p = .032$, 95% CI for *OR* [1.058, 3.437]. The gesture dummy was nonsignificant ($p > .9$), suggesting that this effect is specific to ritualized gestures rather than any gestures. Specifically, more participants in the ritual condition (64.1%) chose virtue (Odwalla bar) over vice (Snickers bar) than those in the random condition (48.4%), $\chi^2(n = 185) = 4.66$, $p = .031$, and those in the control condition (48.4%), $\chi^2(n = 183) = 4.63$, $p = .031$ (see Figure 6). The choice share did not vary between the latter two conditions, $p > .9$. Thus, we combined these two conditions for follow-up analyses. Compared with those in the control and random conditions (48.4%), more participants in the ritual condition (64.1%) chose virtue over vice, $\chi^2(n = 276) = 6.05$, $p = .014$. Additionally, the ritual dummy remained significant ($p = .031$) after controlling for hunger.

Mediating role of feelings of self-discipline. We averaged participants' agreement with the four statements measuring feelings of self-discipline ($\alpha = .86$) to create a composite index. Our theoretical account predicts that boosted feelings of self-discipline underlie the positive effect of rituals on self-control. To test the mediating role of feelings of self-discipline, we first regressed choice on ritual (0 = control or random, 1 = ritual) and found a positive effect of ritual on choice, $b = .65$, $\chi^2(n = 276) = 6.05$, $p = .014$. Next, feelings of self-discipline was regressed on ritual, revealing a positive effect of ritual on feelings of self-discipline, $b = .53$, $t(274) = 2.09$, $p = .037$. Specifically, contrast analysis showed that ritualized gestures ($M = 6.80$, $SD = 1.74$) induced greater feelings of self-discipline than the random gestures condition ($M = 6.24$, $SD = 2.26$), $t(273) = 1.88$, $p = .061$, the control condition ($M = 6.28$, $SD = 1.96$), $t(273) = 1.74$, $p = .084$, and a combination of the latter two, $t(273) = 2.09$, $p = .038$. There was no difference between the random and the control condition, $p > .8$. Moreover, feelings of self-discipline predicted choice, $b = 1.02$, $\chi^2(n = 276) = 71.39$, $p < .001$. Finally, we regressed choice on both ritual and feelings of self-discipline. Results revealed that the effect of feelings of self-discipline remained significant, $b = 1.02$, $z = 8.38$, $p < .001$, whereas the effect of ritual became insignificant, $b = .54$, $z = 1.60$, $p = .11$ (see Figure 7). A bootstrapping analysis (Model 4, Hayes, 2013, a sample size of 5,000) indicated that ritual has a significant indirect effect on choice through feelings of self-discipline, indirect effect = .54, 95% CI [.05 to 1.10]. Taken together, these results support the mediating role of feelings of self-discipline in the relationship between enacting a ritual and exhibiting self-control.

Potential alternative explanations. Across the three conditions, there was no difference in perceived goal importance, decision involvement, decision difficulty, general affect, or overall liking for Snickers bar or Odwalla bar ($ps > .26$). However, there was an effect for decision enjoyment, $F(2, 273) = 3.12$, $p = .046$, such that participants in the random condition ($M = 7.01$, $SD = 2.05$) perceived the food choice as less enjoyable than those in the control condition ($M = 7.57$, $SD = 1.56$), $t(273) = 2.19$, $p = .029$, and ritual condition ($M = 7.55$, $SD = 1.55$), $t(273) = 2.13$, $p = .034$ (see Table 2 for a summary).

We further included these variables in the mediation model. Given the presence of a high correlation between decision enjoyment and general affect, $r = .68$, $p < .01$, we averaged the two measures to create an index of task enjoyment, which was included in the mediation model to deal with the multicollinearity issue. As expected, results of a bootstrapping analysis (a sample size of 5,000) revealed that feelings of self-discipline remained a significant mediator, 95% CI [.002, 1.22], but results did not support the mediating roles of perceived goal importance, 95% CI [−.06, .24], decision involvement, 95% CI [−.06, .18], task enjoyment, 95% CI [−.22, .08], decision difficulty, 95% CI [−.08, .12], or overall liking for Snickers bar, 95% CI [−.13, .62] or Odwalla bar, 95% CI [−.22 to .64].

Discussion. Experiment 3a demonstrates that compared with doing nothing and performing nonritualized gestures, performing ritualized gestures resulted in greater self-control: higher choice likelihood of the healthy option. This finding further bolsters our proposition that the hypothesized effect is specific to ritualized gestures. We also differentiated rituals from habits by showing that the effect of rituals was observed even when participants enacted a ritual for the first time in the self-control context, which left no opportunity for the establishment of a habitual response. More important, we shed light on the psychological process underlying the effect by demonstrating that enacting a ritual led to feelings of heightened self-discipline, which in turn increased behavioral self-control. To test the robustness of our findings, we conducted a preregistered replication study (i.e., Experiment 3b) with the same design.

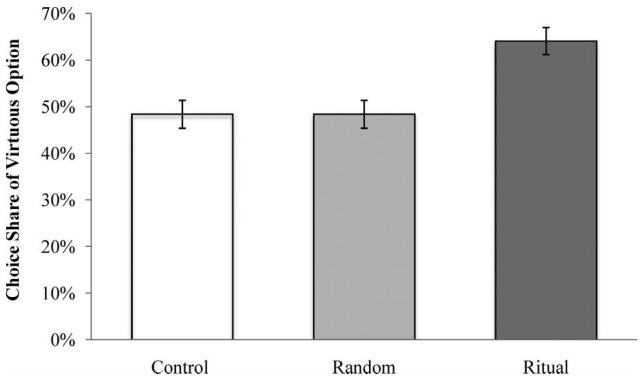

Figure 6. Choice share of virtuous option (Odwalla bar) as a function of ritual condition (Experiment 3a). Error bars represent *SEM*.

Experiment 3b

Method.

Participants. We doubled the sample size from Experiment 3a in this preregistered replication, aiming for 170 participants per experimental condition. After the same screening procedure as in Experiment 3a and after excluding individuals who already participated in Experiment 3a, 497 MTurk participants from across the United States ($M_{age} = 34.32$, $SD = 10.64$, 240 women) completed the present study in exchange for $0.75.

Procedure. This experiment followed the same procedure as in Experiment 3a.

Results.

Manipulation checks. As anticipated, results of one-way ANOVAs revealed that, compared with random gestures, ritualized gestures were perceived to be more like a ritual ($M_{ritual} =$

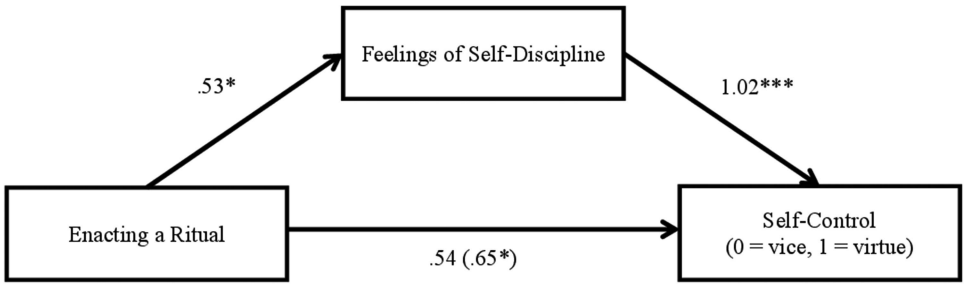

Figure 7. Mediation analysis of the effect of enacting a ritual on self-control through feelings of self-discipline (Experiment 3a). * $p < .05$, *** $p < .001$.

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6.29, $SD = 2.27$ vs. $M_{random} = 4.27$, $SD = 2.74$), $F(1, 331) = 53.78$, $p < .001$, more repetitive ($M_{ritual} = 6.38$, $SD = 2.03$ vs. $M_{random} = 3.85$, $SD = 2.46$), $F(1, 331) = 104.89$, $p < .001$, more rigid ($M_{ritual} = 4.96$, $SD = 2.41$ vs. $M_{random} = 3.33$, $SD = 2.27$), $F(1, 331) = 40.53$, $p < .001$, and more meaningful ($M_{ritual} = 4.93$, $SD = 2.34$ vs. $M_{random} = 3.15$, $SD = 2.31$), $F(1, 331) = 48.22$, $p < .001$. These results confirmed the effectiveness of the ritual manipulation.

Choice. To test our primary hypothesis, we conducted a logistic regression analysis using choice (0 = Snickers bar, 1 = Odwalla bar) as the dependent variable and the following independent variables: (a) a dummy variable for whether participants enacted a ritual (0 = control, 0 = random, 1 = ritual), and (b) a dummy variable for whether participants performed any (random or ritualized) gestures (0 = control, 1 = random, 1 = ritual). As anticipated, results revealed an effect of the ritual dummy, $b = .44$, $\chi^2(n = 497) = 3.90$, $p = .048$, 95% CI for *OR* [1.003, 2.417]. The gesture dummy was nonsignificant ($p > .9$), suggesting that this effect is specific to ritualized gestures rather than any gestures. Specifically, more participants in the ritual condition (64.2%) chose virtue (Odwalla bar) over vice (Snickers bar) than those in the random condition (53.6%), $\chi^2(n = 333) = 3.91$, $p = .048$, and those in the control condition (53.7%), $\chi^2(n = 329) = 3.81$, $p = .051$ (see Figure 8). The choice share did not vary between the latter two conditions, $p > .9$. Thus, we combined these two conditions for follow-up analyses. Compared with those in the control and random conditions (53.6%), more participants in the ritual condition (64.2%) chose virtue over vice, $\chi^2(n = 497) = 5.05$, $p = .025$. Additionally, the ritual dummy was marginally significant ($p = .06$) after controlling for hunger.

Mediating role of feelings of self-discipline. We averaged participants' agreement with the four statements measuring feelings of self-discipline ($\alpha = .84$) to create a composite index. To test the mediating role of feelings of self-discipline, we first regressed choice on ritual (0 = control or random, 1 = ritual) and found a positive effect of ritual on choice, $b = .44$, $\chi^2(n = 497) = 5.05$, $p = .025$. Next, feelings of self-discipline was regressed on ritual, revealing a positive effect of ritual on feelings of self-discipline, $b = .38$, $t(495) = 2.10$, $p = .036$. Specifically, contrast analysis showed that ritualized gestures ($M = 6.93$, $SD = 1.83$) induced greater feelings of self-discipline than the random gestures condition ($M = 6.57$, $SD = 2.00$), $t(494) = 1.76$, $p = .078$, the control condition ($M = 6.55$, $SD = 1.83$), $t(494) = 1.87$, $p = .062$, and a combination of the latter two, $t(494) = 2.10$, $p = .036$. There was no difference between the random and the control condition, $p > .9$. Moreover, feelings of self-discipline predicted choice, $b = .86$, $\chi^2(n = 497) = 120.60$, $p < .001$. Finally, we regressed choice on both ritual and feelings of self-discipline. Results revealed that the effect of feelings of self-discipline remained significant, $b = .86$, $z = 10.90$, $p < .001$, whereas the effect of ritual became insignificant, $b = .28$, $z = 1.16$, $p = .25$ (see Figure 9). A bootstrapping analysis (Model 4, Hayes, 2013, a sample size of 5,000) indicated that ritual has a significant indirect effect on choice through feelings of self-discipline, indirect effect = .32, 95% CI [.01, .63]. Taken together, these results support the mediating role of feelings of self-discipline in the relationship between enacting a ritual and exhibiting self-control.

Potential alternative explanations. Across the three conditions, there was no difference in perceived goal importance, decision involvement, decision enjoyment, decision difficulty, general

Table 2
Control Measures Grouped by Condition (Experiment 3a)

Measures	Control condition Mean (*SD*)	Ritual condition Mean (*SD*)	Random condition Mean (*SD*)	*F*	*p*
Perceived goal importance	7.38 (1.79)	7.59 (1.42)	7.48 (1.73)	.34	.711
Decision involvement	8.01 (1.24)	7.82 (1.26)	7.72 (1.27)	1.28	.281
Decision enjoyment	7.57 (1.56)	7.55 (1.55)	7.01 (2.05)	3.12	.046
Decision difficulty	2.67 (2.13)	2.73 (2.09)	2.83 (2.29)	.124	.883
General affect	7.56 (1.46)	7.47 (1.54)	7.38 (1.56)	.337	.714
Liking for Snickers bar	7.08 (2.30)	6.74 (2.16)	7.11 (1.89)	.856	.426
Liking for Odwalla bar	5.73 (2.39)	5.76 (2.10)	5.28 (2.22)	1.327	.267
Hunger	5.26 (2.39)	5.09 (2.72)	4.94 (2.50)	.385	.681

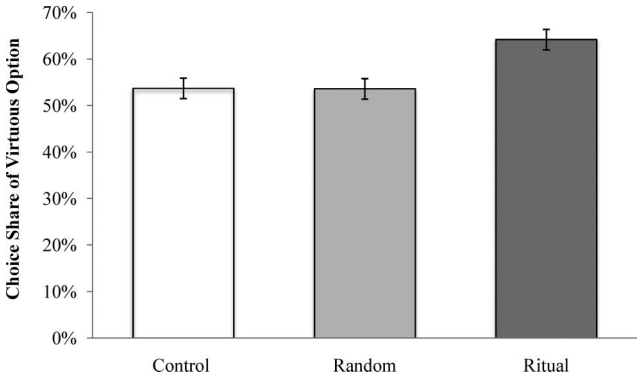

Figure 8. Choice share of virtuous option (Odwalla bar) as a function of ritual condition (Experiment 3b). Error bars represent *SEM*.

affect, or overall liking for Snickers bar or Odwalla bar, *p*s > .12 (see Table 3 for a summary). We also included these variables in the mediation model. Given the presence of a high correlation between decision enjoyment and general affect ($r = .71$, $p < .01$; $\alpha = .83$), we averaged the two measures to create an index of task enjoyment. As expected, results of a bootstrapping analysis (a sample size of 5,000) revealed that feelings of self-discipline remained a significant mediator, 95% CI [.01, .67], but results did not support the mediating roles of perceived goal importance, 95% CI [−.01, .21], decision involvement, 95% CI [−.17, .04], task enjoyment, 95% CI [−.16, .07], decision difficulty, 95% CI [−.01, .17], or overall liking for Snickers bar, 95% CI [−.22, .45] or Odwalla bar, 95% CI [−.22, .45].

Discussion

Experiment 3b replicates the key results of Experiment 3a, albeit with smaller effect sizes. Taken together, the results of Experiments 3a and 3b provide converging evidence that behavioral self-control facilitated by enacting a ritual is distinct from a habitual response, and that the effect of rituals on self-control is driven at least in part by feelings of self-discipline induced by ritual enactment. Our results also suggest that potential alternative accounts such as perceived goal importance, decision involvement, decision difficulty, and task enjoyment are not likely driving the benefits of rituals; we return to consider these accounts in the General Discussion.

Experiment 4: Prosociality

Increasing the generalizability of our findings, Experiment 4 explored a different self-control context in which individuals face conflict between self-interested and prosocial motives: prosocial decision-making. The presence of a dual-motive conflict is a critical element of self-control (e.g., Botvinick, Braver, Barch, Carter, & Cohen, 2001; Kotabe & Hofmann, 2015). Indeed, prior research demonstrates that people often need to exert self-control to override selfish inclinations and engage in prosocial behavior (Achtziger, Alós-Ferrer, & Wagner, 2015; DeWall, Baumeister, Gailliot, & Maner, 2008; Martinsson, Myrseth, & Wollbrant, 2012; Osgood & Muraven, 2015; Rachlin, 2002; Xu, Bègue, & Bushman, 2012).

In Experiment 4 we did not explicitly inform participants that the gestures that they were going to enact constituted a ritual, diminishing concerns about a demand effect from labeling gestures as a "ritual." Because prior conceptualizations suggest that people interpret rigid, repeated sequences of behaviors as meaningful (Kapitány & Nielsen, 2015; Legare & Souza, 2012), we expected that even unlabeled sequences of this form would be likely to be interpreted as ritualistic, such that ritualized gestures can increase self-control even when not labeled a ritual.

Method

Participants. Because this is a new self-control domain, and we ran this experiment before running Experiments 1–3, we did not know what effect size to expect. We decided to collect 40 participants per condition. Out of the 120 observations, we dropped four incomplete ones and the second observation of a participant who took the survey twice. In total, 115 MTurk participants across the United States ($M_{age} = 32.03$, $SD = 11.39$, 48 women) completed this experiment in exchange for $0.50.

Procedure. We randomly assigned participants to one of three conditions (ritual vs. random vs. control). Participants first read about a specific situation:

> On Thursday morning, you receive an e-mail from your good friend A, who just moved to your city. A is going to throw a party this Saturday and has invited you to join the party. You have been planning to attend this party. You know that you will have a lot of fun at the party, and that A will be very disappointed if you cannot come.
>
> However, you suddenly receive another e-mail informing you that your local community is currently preparing for a fundraising event

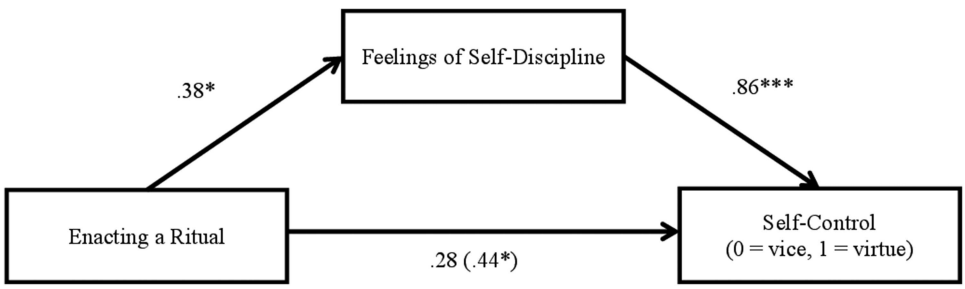

Figure 9. Mediation analysis of the effect of enacting a ritual on self-control through feelings of self-discipline (Experiment 3b). * $p < .05$, *** $p < .001$.

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Table 3
Control Measures Grouped by Condition (Experiment 3b)

Measures	Control condition Mean (*SD*)	Ritual condition Mean (*SD*)	Random condition Mean (*SD*)	*F*	*p*
Perceived goal importance	7.52 (1.62)	7.83 (1.52)	7.52 (1.59)	2.082	.126
Decision involvement	7.61 (1.50)	7.88 (1.44)	7.70 (1.57)	1.357	.258
Decision enjoyment	7.28 (1.80)	7.36 (1.75)	7.40 (1.58)	.226	.797
Decision difficulty	2.80 (2.22)	2.44 (2.20)	2.74 (2.18)	1.261	.284
General affect	7.43 (1.55)	7.53 (1.71)	7.46 (1.59)	.150	.861
Liking for Snickers bar	6.96 (2.27)	6.83 (2.28)	6.99 (2.14)	.253	.777
Liking for Odwalla bar	5.77 (2.16)	5.75 (2.18)	5.42 (2.46)	1.210	.299
Hunger	5.48 (2.53)	5.03 (2.60)	5.38 (2.56)	1.396	.249

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for a local charity helping mentally challenged kids. Because a volunteer suddenly got sick, you are asked whether you would like to step in and help with this fundraising event, which will also take place this Saturday. Because this would require a considerable amount of work, you will not be able to go to A's party if you agree to help with this fundraising event.

Next, before making their choice, participants in the ritual condition performed the following gestures two times in a row.

- Stand upright
- Put your hands on your knees
- Take a deep breath
- Close your eyes, and silently count to 10 (one number per second)
- Then, open your eyes

In contrast, participants in the random condition performed the following gestures only one time:

- Place your left hand on your belly
- Touch the tip of your right finger to the tip of your nose
- Silently count to 10 (one number per second)
- Stomp your feet once
- Keep your legs crossed
- Look at the space key on your keyboard for about 10 s

Immediately after performing the gestures, participants in the ritual and random conditions made their choice as to whether they would like to attend the party (selfish), which was framed as the default choice, or switch to help with the fundraising event (prosocial). Participants in the control condition made this decision before enacting any gestures.

Next, all participants reported their subjective feelings of self-discipline, the same scale as in Experiments 3a and 3b, while making their choice. Participants also reported their decision involvement, anticipated decision enjoyment, experienced decision enjoyment, and general affect, all on 9-point scales (1 = *strongly disagree*, 9 = *strongly agree*).

After completing the dependent measures (but before completing the ritual manipulation check and demographic questions), participants in the control condition performed the same gestures as those in the ritual condition.

To examine the effectiveness of the ritual manipulation, we asked participants to indicate the extent to which they agreed that the gestures they performed felt like a ritual (1 = *strongly disagree*, 9 = *strongly agree*). Participants also rated their agreement with the following statements: "performing these gestures was difficult for me," "performing these gestures was quite effortful," "I performed these gestures as required" (1 = *strongly disagree*, 9 = *strongly agree*). Finally, participants reported demographic information about their gender and age.

Results

Manipulation checks. As anticipated, results of a one-way ANOVA yielded a significant effect of condition, $F(2, 112) = 4.01$, $p = .021$. Specifically, compared with those in the random condition ($M = 4.44$, $SD = 2.82$), participants in the ritual condition ($M = 5.95$, $SD = 2.35$), $t(112) = 2.59$, $p = .011$, and the control condition ($M = 5.74$, $SD = 2.55$), $t(112) = 2.20$, $p = .03$, indicated the gestures they performed felt more like a ritual. There was no difference between the ritual and control conditions, $p = .74$, because participants in both conditions completed the same set of ritualized gestures, although participants in the ritual condition completed them before deciding which event to attend and participants in the control condition completed them after making the critical decision. Additionally, the perceived difficulty and amount of effort needed to enact the gestures did not differ across conditions, $ps > .20$, and all participants performed the gestures as required, $p = .31$.

Choice. To test our primary hypothesis, we conducted a logistic regression analysis using choice (0 = party [default], 1 = fundraising event) as the dependent variable and the following independent variables: (a) a dummy variable for whether participants enacted a ritual before making their choice (0 = control, 0 = random, 1 = ritual), and (b) a dummy variable for whether participants performed any gestures (random or ritualized) before making their choice (0 = control, 1 = random, 1 = random). As anticipated, results revealed a significant effect of the ritual dummy, $b = 1.86$, $\chi^2(n = 115) = 13.01$, $p < .001$, 95% CI for *OR* [2.336, 17.622]. The gesture dummy was nonsignificant ($p > .64$), suggesting that this effect is specific to ritualized gestures rather than any gestures. Specifically, more participants in the ritual condition (59.5%) chose the prosocial option (fundraising event) over the selfish option (party) than did those in the random condition (18.6%), $\chi^2(n = 115) = 14.16$, $p < .001$, and those in the control condition (22.9%), $\chi^2(n = 115) = 9.91$, $p = .002$ (see Figure 10). The choice share did not vary between the latter two conditions, $p > .6$. Thus, we combined these two conditions for follow-up analyses. Compared with those in the control and random conditions (20.5%), more participants in the ritual condition

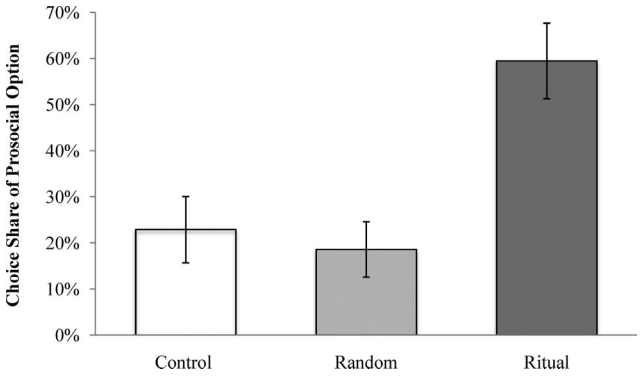

Figure 10. Choice share of prosocial option (fundraising event) as a function of ritual condition (Experiment 4). Error bars represent *SEM*.

(59.5%) chose the prosocial over the selfish option, $\chi^2(n = 115) = 17.21$, $p < .001$.

Mediating role of feelings of self-discipline. We averaged participants' agreement with the four statements measuring feelings of self-discipline ($\alpha = .80$) to create a composite index. To test the mediating role of feelings of self-discipline, we first regressed choice on ritual (0 = control or random, 1 = ritual) and found a positive effect of ritual on choice, $b = 1.74$, $\chi^2(n = 115) = 15.83$, $p < .001$. Next, feelings of self-discipline was regressed on ritual, revealing a positive effect of ritual on feelings of self-discipline, $b = .78$, $t(113) = 2.46$, $p = .015$. Specifically, contrast analysis showed that ritualized gestures ($M = 7.14$, $SD = 1.35$) induced greater feelings of self-discipline than random gestures ($M = 6.47$, $SD = 1.72$), $t(112) = 1.87$, $p = .064$, no gestures ($M = 6.21$, $SD = 1.68$), $t(112) = 2.44$, $p = .016$, and a combination of the latter two $t(112) = 2.49$, $p = .014$. There was no difference between the random and the control condition, $p > .4$. Moreover, feelings of self-discipline predicted choice, $b = .59$, $\chi^2(n = 115) = 13.61$, $p < .001$. Finally, we regressed choice on both ritual and feelings of self-discipline. Results revealed that the effect of feelings of self-discipline remained significant, $b = .55$, $z = 3.23$, $p = .001$, whereas the effect of ritual reduced in significance, $b = 1.58$, $z = 3.40$, $p < .001$ (see Figure 11). A bootstrapping analysis (Model 4, Hayes, 2013, a sample size of 5,000) indicated that ritual has a significant indirect effect on choice through feelings of self-discipline, indirect effect = .43, 95% CI [.12, 1.07]. Taken together, these results support the mediating role of feelings of self-discipline in the relationship between enacting a ritual and exerting self-control.

Potential alternative explanations. Across the three conditions, there was no difference in decision involvement, anticipated decision enjoyment, experienced decision enjoyment, and general affect (*p*s > .82; see Table 4 for a summary). We further included these variables in the mediation model. Results of a bootstrapping analysis (a sample size of 5,000) revealed that feelings of self-discipline remained a significant mediator, 95% CI [.007, .89], but not decision involvement, 95% CI [−.20, .20], anticipated decision enjoyment, 95% CI [−.12, .50], experienced decision enjoyment, 95% CI [−.37, .19], or affect 95% CI [−.14, .49].

Discussion

The results of Experiment 4 provide further evidence for the hypothesis that rituals can boost self-control via heightened feelings of self-discipline. More important, we extended our findings from healthy eating to prosocial decision-making, suggesting that the effect of rituals on self-control may be generalizable to other domains. Additionally, the results of Experiment 4 indicate that ritualized gestures can increase self-control even in the absence of being labeled as a ritual.

Some recent research has questioned the assumption that prosociality requires self-control by showing that people are more likely to behave prosocially under time pressure—suggesting that prosociality is intuitive and, therefore, requires no self-control (Rand, Greene, & Nowak, 2012; Rand, Peysakhovich, Kraft-Todd, Newman, Wurzbacher, Nowak, & Greene, 2014). However, a literature review suggests that the evidence on this is mixed (Achtziger et al., 2015, 2016; Bouwmeester et al., 2017; Capraro & Cococcioni, 2016; DeWall et al., 2008; Halali, Bereby-Meyer, & Ockenfels, 2013; Osgood & Muraven, 2015; Piovesan & Wengström, 2009; Tinghög et al., 2013; Verkoeijen & Bouwmeester, 2014; Xu et al., 2012). Much of this literature indicates that prosocial responses rely on people's inhibition of their natural selfish impulses. Moreover, "the idea that prosociality can be intuitive in no way implies that it always is" (Zaki & Mitchell, 2013, p. 468). In our own Experiment 4, participants in the control condition demonstrated baseline selfishness (77.1%), suggesting that self-interest was the default response; thus, we test whether (and show that) rituals can help people overcome this baseline selfishness.

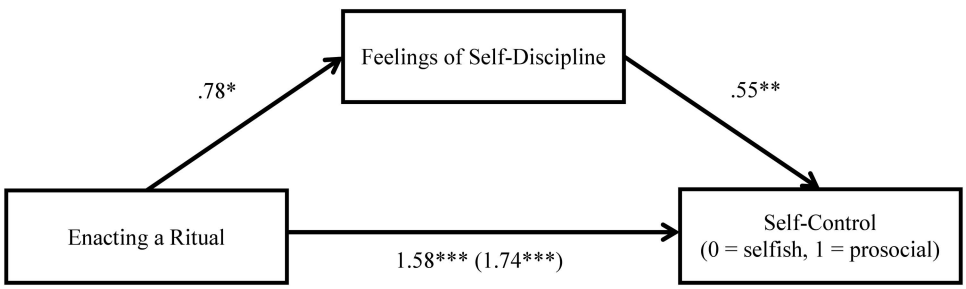

Figure 11. Mediation analysis of the effect of enacting a ritual on self-control through feelings of self-discipline (Experiment 4). * $p < .05$, ** $p < .01$, *** $p < .001$.

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Table 4
Control Measures Grouped by Condition (Experiment 4)

Measures	Control condition Mean (*SD*)	Ritual condition Mean (*SD*)	Random condition Mean (*SD*)	*F*	*p*
Decision involvement	7.43 (1.48)	7.59 (1.32)	7.40 (1.65)	.194	.824
Anticipated decision enjoyment	6.00 (1.96)	5.81 (1.98)	5.98 (2.31)	.089	.915
Experienced decision enjoyment	5.49 (2.16)	5.38 (2.22)	5.65 (2.38)	.148	.862
General affect	6.60 (1.99)	6.81 (1.71)	6.77 (1.72)	.138	.872

Experiment 5: Presence Versus Absence of a Self-Control Conflict

The previous experiments demonstrate that enacting rituals induces a sense of self-discipline and facilitates the exercise of self-control. In all our healthy-eating experiments, we only recruited participants who have a health goal with an implicit assumption that the presence of a dual-motive conflict is necessary for the beneficial effect of ritual to occur. In Experiment 5, we sought to provide additional evidence for our theoretical framework by explicitly testing this boundary condition: that the effect of rituals will dissipate in the absence of a self-control conflict. In addition, we designed Experiment 5 to address an alternative explanation of the findings in Experiment 4: that rituals might prompt action or departures from the status quo in general. Instead, we propose that rituals are specifically effective in increasing a sense of self-discipline, leading people to exert self-control in situations that require such self-control. In Experiment 5, we tested this prediction in a prosocial decision-making context where participants in the presence of a self-control conflict condition chose between a fundraising event and a party, as in Experiment 4, whereas participants in the absence of a self-control conflict condition chose between two parties that also involved a trade-off but not a self-control conflict.

Pretest. We conducted a pretest to demonstrate that the decision to choose the fundraising event over the party required self-control, whereas the decision to choose between two parties did not. There were 105 MTurk participants from across the United States who completed our pretest (M_{age} = 36.54, *SD* = 11.90; 60 women). They read about two decision scenarios in counterbalanced order. Specifically, the text of a decision involving a self-control conflict was identical to the text used in Experiment 4, except that "On Thursday morning" was replaced by "In the morning."

In contrast, the text of a decision not involving a self-control conflict read:

> In the morning, you receive an e-mail from your good friend A, who just moved to your city. A is going to throw a party this Saturday and has invited you to join the party. You have been planning to attend this party. You know that you will have a lot of fun at the party, and that A will be very disappointed if you cannot come.
>
> However, you suddenly receive another e-mail from your good friend B, who is also inviting you to join a party this Saturday. You haven't met B for a long time, and you really want to attend this party. You know that because B is very busy with work, you will not be able to see B in the short run if you decide not to go to B's party.
>
> Because of the time conflict, you will not be able to go to one party if you agree to go to the other one.

Next, participants answered three questions about each scenario: (a) how much self-control would it take for you to choose to attend the charity fundraising event (party B) instead of the party (party A)? (1 = *requires no self-control*, 9 = *requires a lot of self-control*); (b) to what extent do you think this decision involves a trade-off? (1 = *not at all*, 9 = *very much*); and (c) how difficult is it for you to choose between the charity fundraising event (friend B's party) and the party (friend A's party)? (1 = *not at all difficult*, 9 = *very difficult*). Participants also indicated which of the two situations required more self-control.

As expected, participants believed that choosing the charity fundraising event over the party required significantly more self-control (*M* = 6.25, *SD* = 2.59) than choosing Party B over Party A (*M* = 5.09, *SD* = 2.50), $t(104) = 3.36$, $p = .001$. More important, the former was significantly higher than the scale midpoint, $t(104) = 4.94$, $p < .001$, whereas the latter was not, $t(104) = .35$, $p = .726$. Moreover, the trade-off ratings did not differ between the two decisions ($M_{present}$ = 6.69, *SD* = 2.43 vs. M_{absent} = 6.14, *SD* = 2.32), $t(104) = 1.61$, $p = .11$, and both ratings were significantly higher than the scale midpoint, ps < .001. Participants believed it would be less difficult to choose in the fundraising scenario (*M* = 5.16, *SD* = 2.80) than the two parties scenario (*M* = 5.85, *SD* = 2.58), $t(104) = 2.47$, $p = .015$. While the latter was significantly higher than the scale midpoint, $t(104) = 3.37$, $p = .001$, the former was not, $t(104) = .59$, $p = .554$. Finally, the majority of the participants (75.2%) selected the choice involving the charitable fundraising event as requiring more self-control. The results of this pretest support the claim that choosing between a fundraising event and party requires more self-control than choosing between two parties.

Method

Participants. We predetermined a sample size of 100 participants per experimental condition. There were 401 MTurk participants across the United States (M_{age} = 34.01, *SD* = 11.03, 159 women) who completed this experiment in exchange for $0.50.

Procedure. This experiment adopted a 2 (ritual: ritual vs. control) × 2 (self-control conflict: absent vs. present) between-subjects design. We randomly assigned participants to one of the four conditions, following a procedure similar to that of Experiment 4. Specifically, participants in the self-control conflict present (absent) condition read about the same decision scenario as in the pretest.

Before making their choice, participants in the ritual condition performed the same set of ritualized gestures as in Experiment 4 three times in a row. In contrast, participants in the control condition made their choice before enacting any gestures, and then they performed the ritual after making their choice and completing

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the primary dependent measures (but before the ritual manipulation check) as in Experiment 4. We recorded the time participants spent on each ritual instruction page. As in Experiment 4, self-discipline, decision involvement, decision enjoyment, general affect, and a ritual manipulation check measure were included, on 9-point scales. Finally, participants reported demographic information about their gender and age.

Results

Manipulation checks. Because all participants enacted the ritual at some point, we compared the ritual rating in each condition with the midpoint of the scale to check the effectiveness of the ritual manipulation. As expected, the ritual rating was significantly above the midpoint in each of the four conditions: control/absent ($M = 8.16$, $SD = 1.48$), $t(101) = 21.53$, $p < .001$, ritual/absent ($M = 8.46$, $SD = 1.34$), $t(100) = 25.95$, $p < .001$, control/present ($M = 8.31$, $SD = 1.42$), $t(98) = 23.23$, $p < .001$, ritual/present ($M = 8.54$, $SD = 1.02$), $t(98) = 34.37$, $p < .001$, suggesting that the gestures performed were perceived as a ritual. Additionally, results showed that participants on average spent over 20 s on each of the three ritual instruction pages (Round 1: $M = 33.33$s, $SD = 32.38$; Round 2: $M = 24.76$s, $SD = 24.61$; Round 3: $M = 23.12$s, $SD = 25.51$), suggesting that they did engage in the ritual in each round rather than skipping the instructions. More important, a MANOVA showed that neither the main effect of ritual or self-control conflict nor their interaction effect was statistically significant (Fs < 1), suggesting that participants across the four conditions took an equal amount of time to perform the ritual. These results confirmed the effectiveness of the ritual manipulation.

Choice. To test our prediction, we conducted a logistic regression using choice (0 = party A [default], 1 = fundraising event/party B) as the dependent variable, and using ritual (0 = control, 1 = ritual), self-control conflict (0 = absent, 1 = present), and their interaction as the independent variables. Results revealed a significant interaction between ritual and self-control conflict, $b = .83$, $\chi^2(n = 401) = 3.88$, $p = .049$, 95% CI for *OR* [1.004, 5.238]; see Figure 12). As predicted (and replicating Experiment 4), in the presence of a self-control conflict, more participants in the ritual condition (42.4%) switched to help with the fundraising event than those in the control condition (27.3%), $\chi^2(n = 198) = 5.01$, $p = .025$; however, in the absence of a self-control conflict, the choice share of switching to party B did not vary between the ritual group (34.7%) and the control group (38.2%), $\chi^2(n = 203) = .28$, $p = .60$. Results also revealed a marginally significant main effect of self-control conflict, $b = -.50$, $\chi^2(n = 401) = 2.72$, $p = .099$, 95% CI for *OR* [.334, 1.099]), such that party A was more likely to be chosen in the presence (vs. absence) of a self-control conflict. The main effect of ritual was nonsignificant ($p > .5$).

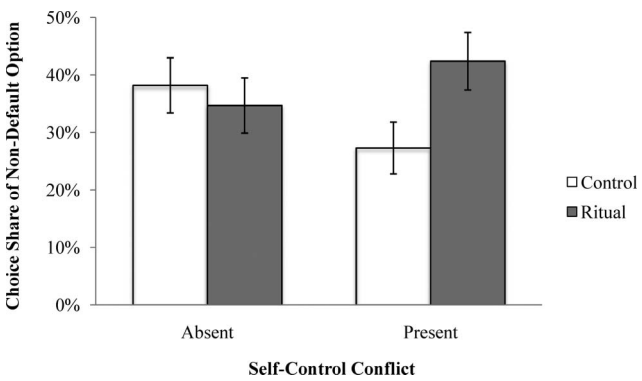

Figure 12. Choice share of nondefault option (fundraising event or party B) as a function of ritual condition and self-control conflict condition (Experiment 5). Error bars represent *SEM*.

Mediating role of feelings of self-discipline. A bootstrapping analysis (Model 15, Hayes, 2013, a sample size of 5,000) revealed that ritual has a significant indirect effect on choice through feelings of self-discipline in the self-control conflict present condition, indirect effect = .20, 95% CI [.03, .44] (see Figure 13).

Potential alternative explanations. A 2 × 2 ANOVA on decision involvement revealed a main effect of ritual, $F(1, 397) = 3.98$, $p = .047$, and a main effect of self-control conflict, $F(1, 397) = 7.54$, $p = .006$, such that participants in the ritual condition ($M = 7.69$, $SD = 1.45$) were more involved in the decision-making than those in the control condition ($M = 7.40$, $SD = 1.57$), and that participants in the self-control conflict absent condition ($M = 7.75$, $SD = 1.39$) were more involved in the decision-making than those in the self-control conflict present condition ($M = 7.34$, $SD = 1.61$). Similarly, a 2 × 2 ANOVA on decision enjoyment revealed a main effect of ritual, $F(1, 397) = 14.71$, $p < .001$, and a main effect of self-control conflict, $F(1, 397) = 4.86$, $p = .028$. Specifically, participants in the ritual condition ($M = 5.45$, $SD = 2.29$) enjoyed the decision-making to a greater extent than those in the control condition ($M = 4.58$, $SD = 2.30$), and participants in the self-control conflict absent condition ($M = 4.76$, $SD = 2.26$) enjoyed the decision-making to a lesser extent than those in the self-control conflict present condition ($M = 5.27$, $SD = 2.38$). A 2 × 2 ANOVA on affect revealed only a main effect of ritual, $F(1, 397) = 11.42$, $p = .001$, such that participants in the ritual condition ($M = 6.85$, $SD = 1.74$) were in a more positive mood than those in the control condition ($M = 6.20$, $SD = 2.08$; see Table 5 for a summary).

More important, we included decision involvement, decision enjoyment, and affect into the moderated mediation model to address these alternative explanations. Results revealed that while feelings of self-discipline remained a significant mediator, 95% CI [.03, .58], decision involvement, 95% CI [−.21, .02], decision enjoyment, 95% CI [−.26, .07], and affect, 95% CI [−.10, .28], did not.

Discussion

Experiment 5 not only replicates the findings of Experiment 4, but further shows that while enacting a ritual boosts the likelihood of choice switching (from a default selfish option to a nondefault prosocial option) in the presence of a self-control conflict, rituals do not affect choice switching in the absence of a self-control conflict. These results suggest that rituals do not universally promote any action or departures from the status quo; instead, the benefits of rituals are particularly likely to emerge when people face a self-control conflict—when feelings of self-discipline can be harnessed to promote prosocial behavior.

Additional Experiments

In the course of our research, we conducted additional experiments that are not reported in this article. We conducted an internal

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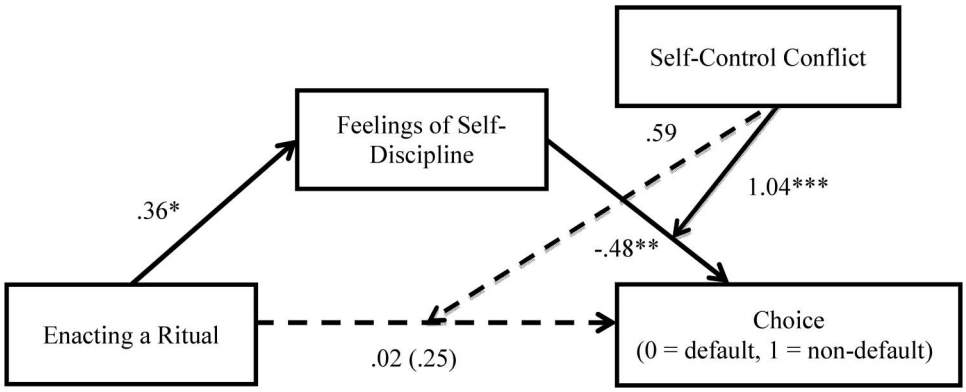

Figure 13. Moderated mediation analysis of the effect of enacting a ritual and the absence versus presence of a self-control conflict on self-control through feelings of self-discipline (Experiment 5). * $p < .05$, ** $p < .01$, *** $p < .001$. We note that the overall effect of feelings of self-discipline on choice (i.e., switching to the nondefault option) was unexpectedly negative. This is because, in the self-control conflict absent condition, feelings of self-discipline negatively predicted choice ($b = -.48$, $p < .001$). In contrast, in the self-control conflict present condition, feelings of self-discipline, as expected, positively predicted choice ($b = .56$, $p < .001$).

meta-analysis of our overall body of evidence using the effect sizes of behavioral self-control when enacting ritualized gestures versus no gestures or random gestures. This meta-analysis comprises a total of 17 experiments (including the six reported in the article) spanning five self-control domains: healthy eating, prosociality, persistence, procrastination, and intertemporal choice. Given that these experiments vary in their settings, ritual manipulations, and self-control measures, we used a random effects model for the meta-analysis. Results of the meta-analysis revealed a statistically significant effect (see Table 6 for full list of experiments and the online supplemental materials for details on the nonincluded experiments): specifically, the aggregate effect size for enacting rituals on self-control was $OR = 1.622$, 95% CI [1.233, 2.135], $z = 3.451$, $p = .001$, indicating that, compared with enacting random gestures or not making gestures, enacting ritualized gestures led people to exercise greater self-control.

However, the results revealed substantial heterogeneity across the five self-control domains, $Q(16) = 57.968$, $p < .001$, $I^2 = 72.399$. Thus, we conducted separate meta-analyses within each self-control domain. We obtained a small-to-medium effect size for healthy eating, $OR = 1.935$, 95% CI [1.509, 2.481], $z = 5.200$, $p < .001$, and a medium-to-large effect size for prosociality, $OR = 2.97$, 95% CI [1.656, 5.327], $z = 3.652$, $p < .001$. In contrast, we obtained null effects for task persistence, $OR = 0.012$, 95% CI [−0.249, 0.273], $z = 0.092$, $p = .927$, and procrastination and intertemporal choices, $OR = 0.148$, 95% CI [−0.092, 0.387], $z = 1.207$, $p = .227$. Thus, the effect of rituals is more pronounced in the domains of health and prosocial decisions, and weaker to nonexistent in the domains of persistence, procrastination, and intertemporal choice. The six experiments included in this article tested the effect of rituals on healthy eating and prosociality, self-control domains that yielded more robust and consistent results. We briefly review the other studies conducted below; more details can be found in the supplemental materials.

In the domain of persistence, our first two experiments (Experiments 8 and 9) showed that rituals enhance persistence (on a difficult spot-the-difference task), but the following two experiments (Experiments 10 and 11) failed to replicate this effect. Because none of these studies included a manipulation check, it is unclear whether the null effects are because of unsuccessful ritual manipulations or the ineffectiveness of rituals in boosting persistence. We therefore conducted a well-powered study (Experiment 12), which included a manipulation check. This experiment helps to provide insight into why rituals might not always increase persistence or self-control in general. In this experiment, we provided participants with a goal to persist on a difficult spot-the-difference task, and randomly assigned them to perform a ritual or no ritual before the task. The ritual manipulation was successful according to our manipulation check. Results revealed that while performing rituals increased persistence via self-reported enhanced

Table 5
Control Measures Grouped by Condition (Experiment 5)

	Self-control conflict absent		Self-control conflict present	
	Control condition	Ritual condition	Control condition	Random condition
Measures	Mean (*SD*)	Mean (*SD*)	Mean (*SD*)	Mean (*SD*)
Decision involvement	7.62 (1.40)	7.88 (1.37)	7.17 (1.70)	7.51 (1.51)
Decision enjoyment	4.42 (2.18)	5.11 (2.29)	4.74 (2.41)	5.80 (2.25)
General affect	6.08 (2.10)	6.95 (1.67)	6.32 (2.07)	6.75 (1.82)

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Table 6
Meta-Analysis Across 17 Experiments

Design	Manipulation check	*M*s across conditions	*p*-value	Effect size (odds ratio)	95% CI	Sample size	Self-control domain	Experiment
Ritual vs. control	Not included	M_{ritual} = 1424.26 *SD* = 224.92 $M_{control}$ = 1648.12 *SD* = 389.27, *t* = 3.19	.002	3.52	[1.59, 7.80]	85	Health	Experiment 1
Ritual vs. random vs. control	Not included	M_{ritual} = 58.2% M_{random} = 46.2%, χ^2 = 1.92 $M_{control}$ = 34.8%, χ^2 = 7.29	.050 random .009 control	2.15	[1.18, 3.93]	198	Health	Experiment 2
Ritual vs. random vs. control	M_{ritual} = 6.00 *SD* = 2.43 M_{random} = 4.34 *SD* = 2.91, *F* = 17.68	M_{ritual} = 64.1% M_{random} = 48.4%, χ^2 = 4.66 $M_{control}$ = 48.4%, χ^2 = 4.63	.014 Random and control combined	1.91	[1.14, 3.19]	276	Health	Experiment 3a
Ritual vs. random vs. control	M_{ritual} = 6.29 *SD* = 2.27 M_{random} = 4.27 *SD* = 2.74, *F* = 53.78	M_{ritual} = 64.2% M_{random} = 53.6%, χ^2 = 3.91 $M_{control}$ = 53.7%, χ^2 = 3.81	.025 Random and control combined	1.55	[1.06, 2.28]	497	Health	Experiment 3b
Ritual vs. random vs. control	M_{ritual} = 5.95 *SD* = 2.35 M_{random} = 4.44 *SD* = 2.82, M_{random} = 5.74 *SD* = 2.55	M_{ritual} = 59.5% M_{random} = 18.6%, χ^2 = 14.16 $M_{control}$ = 22.9%, χ^2 = 9.91	<.001	5.69	[2.41, 13.39]	115	Prosociality	Experiment 4
2 (ritual vs. control) × 2 (self-control conflict: absent vs. present)	M_{ritual} = 8.50 *SD* = 1.19 $M_{control}$ = 8.23 *SD* = 1.45, *F* = 3.85	Present: M_{ritual} = 42.4% $M_{control}$ = 27.3%, *p* = .025 Absent: M_{ritual} = 34.7% $M_{control}$ = 38.2%, *p* = .596	.025	1.96	[1.08, 3.56]	401	Prosociality	Experiment 5
2 (ritual vs. control) × 2 (type of self-control: action vs. inaction)	Rating in each of the four cells was higher than the scale midpoint	Action: M_{ritual} = 56.5% $M_{control}$ = 31.3%, χ^2 = 8.26 Inaction: M_{ritual} = 35.4% $M_{control}$ = 36.4%, χ^2 = .01	.004	2.84	[1.38, 5.84]	260	Prosociality	Experiment 6
2 (ritual vs. control) × 2 (self-control conflict: absent vs. present)	M_{ritual} = 5.98 *SD* = 2.40 vs. scale midpoint(5), *t* = 3.71	Present: M_{ritual} = 46.3% $M_{control}$ = 25.6%, χ^2 = 3.94, *p* = .047 Absent: M_{ritual} = 64.1%	.047	2.51	[1.00, 6.30]	165	Health	Experiment 7

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Table 6 (*continued*)

Design	Manipulation check	*M*s across conditions	*p*-value	Effect size (odds ratio)	95% CI	Sample size	Self-control domain	Experiment
		$M_{control}$ = 57.1%, χ^2 = .41, p = .52						
Ritual vs. control	Not included	M_{ritual} = 103.15 SD = 41.67 $M_{control}$ = 79.58 SD = 48.46, F = 4.1	.048	2.57	[.92, 7.15]	50	Persistence	Experiment 8
Ritual vs. control	Not included	M_{ritual} = 88.71 SD = 56.9 $M_{control}$ = 69.55 SD = 36.44, F = 5.66	.019	2.04	[1.02, 4.09]	109	Persistence	Experiment 9
Ritual vs. control	Not included	M_{ritual} = 98.14 SD = 68.76 $M_{control}$ = 114.11 SD = 103.37, F = 1.08	.302	.72	[.39, 1.35]	131	Persistence	Experiment 10
Ritual vs. control	Not included	M_{ritual} = 70.20 SD = 39.80 $M_{control}$ = 109.03 SD = 349.61, F = 1.38	.242	.76	[.48, 1.20]	231	Persistence	Experiment 11
Ritual vs. control	M_{ritual} = 5.67 SD = 2.79 vs. scale midpoint, t = 2.73	M_{ritual} = 60.36 SD = 47.14 $M_{control}$ = 71.27 SD = 51.09, F = 3.12	.078	.67	[.43, 1.05]	253	Persistence	Experiment 12
Ritual vs. random	M_{ritual} = 6.27 SD = 3.09 M_{random} = 4.18 SD = 3.59, F = 15.74	M_{ritual} = 242.61 SD = 200.96 M_{random} = 293.63 SD = 217.87, F = 2.41	.123	1.55	[.89, 2.73]	164	Procrastination	Experiment 13
Ritual vs. random	M_{ritual} = 7.33 SD = 2.44 M_{random} = 4.40 SD = 3.46, F = 28.56	M_{ritual} = 224.65 SD = 200.62 M_{random} = 320.15 SD = 177.65, F = 7.48	.007	2.49	[1.281, 4.842]	118	Procrastination	Experiment 14
Ritual vs. random	M_{ritual} = 5.61 SD = 2.96 M_{random} = 3.33 SD = 3.40, F = 27.88	M_{ritual} = 263.2 SD = 185.15, M_{random} = 247.44 SD = 188.53, F = .39	.533	.86	[.53, 1.38]	222	Procrastination	Experiment 15
Ritual vs. random	M_{ritual} = 5.61 SD = 2.55 M_{random} = 3.81 SD = 2.55, F = 24.92	M_{ritual} = 51.87% SD = 36.79% M_{random} = 51.16% SD = 38.61%, F = .018	.894	1.04	[.63, 1.71]	201	Inter-temporal choice	Experiment 16

Note. CI = confidence interval. The original effect sizes of Experiment 1 and Experiments 8–16 are mean differences, which are transformed into odds ratios for the meta-analysis. Experiments 3b, 10, 15 are preregistered studies (see: https://osf.io/tcxha/, https://aspredicted.org/x4d6c.pdf, and https://aspredicted.org/sk7tn.pdf, respectively). We preregistered these studies because we had pretested the paradigm in other studies.

self-discipline (as we have demonstrated in other experiments), it also decreased goal adherence (that we did not measure in prior experiments). The two competing pathways exerted reciprocal influence on self-control behavior, resulting in a marginal negative effect of enacting rituals on persistence. These findings suggest that when people already have a goal that matters to them (as may often be the case for decisions to be healthy or prosocial), rituals may enhance self-discipline to improve self-control, but when the goal is not as meaningful (e.g., forcing people to do "spot-the-difference" tasks in an online study), rituals may lead people to care less about the goal, counteracting any benefits of self-control.

In the domain of procrastination, participants completed a writing task with a performance-contingent reward, but were given the opportunity to "waste" time by first playing a video game (Tetris) for as long as they wanted before they proceeded to the writing task. Participants performed either a ritual or random gestures before proceeding to the two activities. Our first two experiments (Experiments 13 and 14) showed that rituals reduced procrastination (i.e., spending less time on Tetris) but the third, preregistered experiment (Experiment 15) failed to replicate this finding. This is at least partially because some participants did not follow the ritual instructions. In a post hoc analysis, we found that, compared with performing random gestures, performing a ritual significantly undermined self-control (i.e., increased procrastination) among those who spent little time performing the ritual, but significantly boosted self-control among those who spent longer time performing the ritual. These results may reflect self-selection such that people who follow instructions are less likely to procrastinate than those who ignore them. These results also suggest that rituals may enhance self-control when performed in a correct manner, but may hamper self-control when not strictly enacted.

Finally, we observed a null effect of rituals on intertemporal choice in one study (Experiment 16), suggesting that rituals may be ineffective in this domain (although additional research is needed to examine this more thoroughly). All of the above results suggest several ways in which the effect of rituals on self-control might be complex, and future research is warranted to deepen our understanding of the heterogeneity in the effect of rituals across different self-control domains, and to better identify the conditions under which rituals impede versus improve self-control.

General Discussion

In a series of experiments in the field, in the laboratory, and online, we demonstrate that rituals can enhance self-control by increasing feelings of self-discipline. We tested our predictions in different self-control domains: losing weight (Experiment 1), eating healthily (Experiments 2, 3a, and 3b), and behaving prosocially (Experiments 4 and 5). In a longitudinal field study, Experiment 1 showed that engaging in a food consumption ritual over a 5-day period helped participants reduce calorie consumption. Experiment 2 demonstrated that pairing a ritual with a healthy eating task led to greater likelihood of choosing healthy food in a subsequent decision and that this effect was specific to rituals (vs. nonrituals). Differentiating rituals from habits, Experiments 3a and 3b showed that enacting a novel ritual led to increased choice likelihood of healthy food over unhealthy food. Generalizing our finding to a prosocial decision-making context, Experiments 4 and 5 demonstrated that the facilitative effect of rituals on self-control still held even when a set of ritualized gestures enacted were not explicitly labeled as a ritual. More important, Experiments 3, 4, and 5 provided direct evidence for our proposed psychological process underlying the benefits of rituals: heightened feelings of self-discipline drove the facilitative effect of rituals on self-control. Finally, Experiment 5 demonstrated that rituals affect behavior because they influence people's responses specifically to self-control conflicts. Across the experiments, we assessed several potential alternative explanations for the efficacy of rituals.

Theoretical Contributions

Our results bridge the ritual literature and the self-control literature by providing causal evidence for the beneficial effect of rituals on individual self-control—and documenting a novel strategy for successful self-control. Moreover, we shed light on the psychological process underlying this effect by showing that rituals boost feelings of self-discipline, which translates to increased behavioral self-control. In addition, across the experiments, we assessed a possible role for a number of potential alternative constructs. Specifically, at least in the studies that we conducted, the effect of rituals on self-control was not mediated by changes in affect, task involvement, perceived goal importance, decision difficulty, or decision enjoyment. Note also that the rituals used in our experiments did not involve muscle tightening, which has been shown to help people summon willpower and behave in line with long-term virtuous goals (Hung & Labroo, 2011).

Previous research has identified a variety of cognitive and behavioral strategies for boosting self-control, such as precommitment (Ariely & Wertenbroch, 2002; Hoch & Loewenstein, 1991; Schwartz et al., 2014), self-distraction from temptations (Hoch & Loewenstein, 1991; Mischel & Ebbesen, 1970), self-imposed penalties (Ainslie, 1975; Trope & Fishbach, 2000), enhanced motivation (Muraven & Slessareva, 2003), implementation intentions (Webb & Sheeran, 2003), high-level construal (Fujita, Trope, Liberman, & Levin-Sagi, 2006), positive affect (Tice, Baumeister, Shmueli, & Muraven, 2007), self-affirmation (Schmeichel & Vohs, 2009), muscle tightening (Hung & Labroo, 2011), selective information processing (Trudel & Murray, 2011), and self-talk (Kross et al., 2014; Patrick & Hagtvedt, 2012), among others. Our results suggest that rituals offer an additional means by which people can exercise self-control in the moment.

The present research links to at least four other important literatures that speak to how rituals might relate to self-control: rituals in obsessive–compulsive disorder, preperformance rituals, religious rituals, and meditative rituals in Eastern traditions. First, people with clinical disorders associated with anxiety, stress, or trauma often develop rituals, presumably as a coping mechanism (e.g., Rachman & Hodgson, 1980). A paradigmatic example is individuals who have obsessive–compulsive disorder (OCD), a disorder that is defined by its ritualistic compulsions and "need for order or symmetry" (*Diagnostic and Statistical Manual for Mental Disorders-Fifth Edition, DSM–5*). Not only are individuals with OCD more likely to engage in ritualistic behavior such as repetitive tapping and gesturing, but they often self-report that engaging in these behaviors brings them a sense of control and relief (Reuven-Magril, Dar, & Liberman, 2008). Other clinical populations under intense stress such as abuse victims (Jacobs, 1989) and palliative care patients (Romanoff & Thompson, 2006) have been

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shown to adopt rituals as well, suggesting that rituals may function more broadly to enhance felt control. However, this research does not examine the value of engaging in rituals; our results offer one reason for why these clinical populations tend to adopt rituals.

Second, the sports psychology literature has documented the existence of "preperformance routines" commonly used by athletes, which involve ritualistic elements of symbolism, repetitiveness, and rigidity (Womack, 1992). Correlational data suggests that these routines can improve athletes' performance, although it could be the case that better athletes are more likely to engage in such routines (Cohn, Rotella, & Lloyd, 1990; Czech, Ploszay, & Burke, 2004; Foster, Weigand, & Baines, 2006; Gayton, Cielinski, Francis-Keniston, & Hearns, 1989; Lobmeyer & Wasserman, 1986; Predebon & Docker, 1992; Weinberg, Gould, & Jackson, 1979). Our article joins a small but growing body of research suggesting that rituals and superstitions can causally affect performance (see also Brooks et al., 2016; Damisch, Stoberock, & Mussweiler, 2010).

Third, religious concepts, which are closely linked to ritual practice and prayer, have been shown to improve self-regulation and self-control (e.g., Fishbach, Friedman, & Kruglanski, 2003; Laurin, Kay, & Fitzsimons, 2012; Mazar, Amir, & Ariely, 2008; Rounding, Lee, Jacobson, & Ji, 2012; Shariff & Norenzayan, 2007; Xygalatas, 2013; but see Good, Inzlicht, & Larson, 2015), suggesting that the rituals common to many religions might be associated with ongoing goals of impulse control and self-monitoring (Koole, McCullough, Kuhl, & Roelofsma, 2010; McCullough & Willoughby, 2009; Norenzayan, Shariff, Gervais, Willard, McNamara, Slingerland, & Henrich, 2016; Rossano, 2012). Considering this literature in light of our results, the regular practice of religious rituals might signal self-discipline to the performer, promoting adaptive behaviors that enhance health and well-being (Whitehouse, 2002; Wood, 2016).

Finally, our effect is also reflected in classical Confucian philosophy, which places considerable emphasis on ritual through goal-directed action and the internalization of values (e.g., Ivanhoe, 2007; Sarkissian, 2010; Slingerland, 2015). For example, there is evidence suggesting that East Asians from highly ritualized Confucian cultures have improved self-regulation compared with people from Western cultures (Butler, Lee, & Gross, 2007; Sarkissian, 2014; Seeley & Gardner, 2003). Likewise, the military lifestyle is known to induce both self-discipline and behavioral regulation, with rituals consisting of rigid drills that involve synchronous marching, chanting, and other regimented behaviors that ensure order and high levels of motivation (e.g., Aronson & Mills, 1959; King, 2013; McNeill, 1995; Mills & Mintz, 1972). These examples provide broader sociological instantiations of the microlevel perspective of our experiments.

Future Directions

We suggest several key future directions stemming from this research. First, are rituals always beneficial to self-control? Indeed, some prior research suggests a negative relationship between rituals and self-control. For instance, Wansink and Van Kleef (2014) observed positive correlations between some rituals (e.g., eating with the TV on) and BMIs. Moreover, because of the rigid and demanding nature of rituals, enacting a ritual per se may require self-regulatory strength (Lu, 2013; McCullough & Willoughby, 2009; Nolte-Schamm, 2006). Consequently, people might be more likely to succumb to immediately gratifying temptations after enacting a difficult ritual. In addition, rituals may hinder self-control when rituals are paired with indulgent behaviors over time—as in Vohs et al. (2013) where rituals are paired with consumption of chocolate—thus, becoming a ritual that cues unhealthy responses. Given their ubiquity, rituals are likely paired with and influence countless behaviors, both adaptive and maladaptive; our research suggests one manner in which rituals can be harnessed to increase self-control. As discussed in the meta-analysis, the moderating roles of meaningfulness of a focal goal and ritual compliance are potentially important directions for future research.

A second important future direction is to explore alternative possible mechanisms of the effects of rituals on self-control, beyond enhancing feelings of self-discipline. Indeed, one way to better predict when rituals will and will not affect self-control is to better understand the underlying mechanisms. One possibility, for instance, is that rituals promote greater mindfulness, consistent with research on ritualistic meditation practices (Elkins-Brown, Teper, & Inzlicht, 2017). In fact, compared with random gestures, many rituals used in our experiments possess some mindfulness elements or deliberation cues (e.g., take a deep breath, silently count to 10). This raises a question as to whether such mindfulness elements are indispensable.[5] We think that although they may help or strengthen the effect of rituals on self-control, they are not necessary. For example, ritualized gestures used in Experiments 1 and 2 do not have strong mindfulness elements as compared to random gestures, and we still observed the predicted effect. It is likely that performing rituals, regardless of the presence or absence of mindfulness elements, per se leads people to become more deliberative, resulting in heightened feelings of self-discipline. Future research is needed to investigate this conjecture. Another possibility is that rituals increase involvement in the decision; indeed, at least one set of experiments suggest that rituals can increase involvement (Vohs et al., 2013), and involvement has been shown to predict self-control (Milyavskaya, Inzlicht, Hope, & Koestner, 2015). A third possibility is that the act of pursuing and correctly completing a ritual increases feelings of control. For example, people who engage in arbitrarily created ritual after loss feel more control and reduced grief (Norton & Gino, 2014). This explanation implies that rituals must be done "properly," which could be why completing them feels particularly good compared with completing other types of behavior that do not have to be done with such specificity. Finally, enacting a ritual might boost self-control by bolstering people's perceived self-efficacy, which refers to people's beliefs about their capabilities to enact behaviors necessary to produce specific performance attainments (Bandura, 1997).

Third, which features of ritual are particularly important for activating feelings of self-discipline? In our manipulations, we created rituals that adhere closely to our definition of ritual (i.e., "a fixed episodic sequence of actions characterized by rigidity and repetition") and compared their effects to random gestures that, despite involving many of the same movements, do not contain

[5] We thank an anonymous reviewer for bringing this question to our attention.

these ritualistic elements. Therefore, our current set of studies cannot disentangle whether rituals are effective because they are repetitive, rigid, occur in a fixed order, or some combination of all three elements. Future work could independently vary these different elements of rituals to understand which aspects are most important for enhancing self-control.

Fourth, the present research focuses on the short-term effect of rituals on self-control, but their long-term effect warrants further investigation. Repeatedly enacting rituals has been suggested as means to build one's self-control capacity (Cheng, 2004; McCullough & Willoughby, 2009). Ritual engagement may serve as a form of self-control exercise or practice, which could amplify one's self-regulatory abilities and facilitate long-term effective self-control (Muraven, Baumeister, & Tice, 1999; Oaten & Cheng, 2006a, 2006b, 2007; Sultan, Joireman, & Sprott, 2012). Alternatively, since rituals can become habitualized (Graybiel, 2008), it is possible that the long-term benefits of rituals are achieved through a process of habitualization. That is, rituals promote self-control by boosting feelings of self-discipline (a short-term effect), which in turn facilitate the formation of a beneficial self-control habit (a long-term effect; Galla & Duckworth, 2015). In this case, rituals may—over longer time frames—begin to serve as stable environmental events (Wood, Quinn, & Kashy, 2002) or preceding actions (Neal, Wood, & Quinn, 2006) in and of themselves, cueing self-control acts that have been repetitively performed in the past.

Finally, it should be noted that our findings are based on data obtained from Americans (college students, MTurk workers, and community members). Prior research has suggested that conclusions drawn from WEIRD (Western, Educated, Rich, Industrialized, and Democratic) populations may not hold in other populations (Henrich, Heine, & Norenzayan, 2010). However, given that rituals are ubiquitous across countries and cultures (Hobson et al., 2017; Westman, 2011; Whitehouse, 2012)—from Africa (e.g., Bonsu & Belk, 2003; Du Toit, 1980; Sangree, 1970) to Europe (e.g., Papadakis, 2003; Pink, 1997) to Asia (e.g., Harmon, 2010; Hockings, 2001; Purzycki & Arakchaa, 2013; Sosis & Ruffle, 2003) to America (e.g., Fox et al., 1996; Lomnitz, 1995; Siskind, 1992)—and that our research focuses on secular personal rituals that are not deeply rooted in any specific culture, it is possible that our results extend to different populations. We encourage future research to use more diverse non-WEIRD samples to examine the robustness of the effect of rituals on self-control.

Conclusion

Some of the most worrisome and costly problems affecting society have at their core failures to exercise self-control. To address these problems, scholars across disciplines have identified tools to help people exercise control. We extend this body of work by documenting the effect of engaging in simple rituals on self-discipline: enacting a personal ritual can effectively promote self-control.

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