The Mediating Role of Monitoring in the Association of Religion With Self-Control

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Abstract

Religiosity is related to a variety of positive outcomes and the nature of this relationship has long been a topic of inquiry. Recently, it was proposed that an important piece of this puzzle may be the propensity for religious beliefs to promote self-control, a trait that is linked to a range of benefits. How religion translates into self-control, however, remains unclear. We examined the extent to which religiosity's relationship with self-control is mediated by self-monitoring, perceived monitoring by God, and perceived monitoring by other people. Results revealed that more religious people tended to monitor their standing regarding their goals (self-monitoring) to a greater degree, which in turn related to more self-control. Also, religious people tended to believe that a higher power was watching them, which related to greater self-monitoring, which in turn was related to more self-control.

Keywords

Religious belief and behavior have a variety of robust links to mental health, well-being, and social behavior. To note a few, religion has been associated with longer life spans (McCullough, Hoyt, Larson, Koenig, & Thoresen, 2000), higher frequency of health behaviors such as visiting health care professionals (Hill, Burdette, Ellison, & Musick, 2006), less depression (Smith, McCullough, & Poll, 2003), higher academic achievement (Regnerus, 2000), higher marital satisfaction (Mahoney, Pargament, Tarakeshwar, & Swank, 2001), and less criminal activity (Baier & Wright, 2001).

McCullough and Willoughby (2009) proposed that the link from religion to these other variables stems at least partly from religion's ability to promote self-control. The finding that religion is linked to self-reported self-control—the overriding of prepotent responses (e.g., emotions or motivations; Baumeister, Vohs, & Tice, 2007)—is well established (for a review, see McCullough & Willoughby, 2009). For example, in a nationally representative sample of U.S. students, Desmond, Ulmer, and Bader (2008) found that religiosity was positively correlated with self-reported self-control. Similarly, in a sample of Muslim teenagers, French, Eisenberg, Vaughan, Purwono, and Suryanti (2008) found that an index of self-control composed of parent- and self-report was positively correlated with an index of religiosity that was based on parent-and self-reports.

Monitoring, Self-Regulation, and Self-Control

What are the component processes by which religion relates to self-control? One potential mediating mechanism is self-monitoring. Self-control is a subset of the broader phenomenon of self-regulation, the process by which behavior is brought into conformity with standards (Carver & Scheier, 1998). Self-regulation as a negative feedback process requires at least three elements: (a) goals, (b) monitoring of current conditions, and (c) outputs. Goals give the system a reference value for comparison, monitoring reveals any existing discrepancies between the current state and that reference value, and outputs vary in ways that keep sensed discrepancies minimized.

Monitoring has been conceptualized as a state of self-awareness about how one is behaving relative to a norm or standard ("What am I doing and what should I be doing?"). The finding that increased self-focus (e.g., via the placement of a mirror in the laboratory) causes behavior to more closely approximate salient standards is well replicated (e.g., Carver, 1974, 1975; Gendolla, Richter, & Silvia, 2008; Gibbons, 1978; Macrae, Bodenhausen, & Milne, 1998; Scheier, Fenigstein, & Buss, 1974; Wicklund & Duval, 1971). Therefore, greater focus on one's current status with respect to one's goals should lead to more successful self-control (i.e., greater inhibition of standard-inappropriate responses). One hypothesis, then, is that religion might act to increase people's monitoring of their behavior, thus affecting self-control.

Religion might also promote self-control by fostering the belief that one is being monitored by God or by other people

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Table 1. Descriptive Statistics, Reliability, and Zero-Order Correlations for all Variables of Interest

Variable name	Mean (SD)	α	Zero-Order Correlations							
			1	2	3	4	5	6	7	8
1. Interpersonal RCI	0.60 (0.47)	.81								
2. Intrapersonal RCI	0.63 (0.51)	.91	.72**							
3. Prayer	1.62 (1.42)	NA	.56**	.67**						
4. General self-control	3.24 (0.71)	.82	.17**	.16**	.20**					
5. Perseverance	3.96 (0.68)	.85	.12**	.21**	.15**	.61**				
6. Self-monitoring	4.54 (1.40)	.67	.31**	.44**	.31**	.22**	.23**			
7. Monitoring by others	3.60 (1.52)	.81	.08	.10*	.06	−.16**	−.12**	.26**		
8. Monitoring by God	3.92 (2.25)	.97	.51**	.63**	.59**	.12**	.12**	.44**	.27**	
9. Sex (male = 1)	NA	NA	−.06	−.04	−.12	−.09	−.11	−.06	−.03	−.12

Note. RCI = Religious Commitment Inventory. $N = 583$ for all variables (except for sex where $N = 252$).
*$p \leq .05$. **$p \leq .01$.

in one's life. The perception that one is being monitored by others in such a fashion could in turn increase one's own self-monitoring—an effect that would be consistent with the finding that the perceived presence of an evaluative audience increases self-awareness, which in turn leads people to compare their behavior to relevant standards (Carver & Scheier, 1978, 1998). Inasmuch as religious belief systems posit gods or spirits that observe humans' behavior and pass judgment (Bering & Johnson, 2005), the gods and spirits would seem to represent an evaluative audience, and in fact, researchers have reported findings in which the perceived presence of God appeared to modify decision making: Priming religious concepts seems to destroy anonymity during economic games (Shariff & Norenzayan, 2007), for example, and the extent to which one believes in a God that is engaged with humans is positively associated with rating the performance of actions prohibited by religious belief as more morally wrong (Morewedge & Clear, 2008).

Similarly, religious communities often represent groups of people who evaluate behaviors (both their own and others') in the light of religious goals. Therefore, it seems plausible that commitment to and involvement with religious belief systems would be associated with a greater tendency to feel monitored by supernatural others and other humans. This link might in turn lead to higher levels of monitoring one's own goals and thereby to greater self-control.

The present study examined these possibilities. We focused on how religious involvement might be related to three forms of monitoring: Perceived monitoring by supernatural agents (the belief that supernatural agents, such as gods and spirits, observe one's behaviors and thoughts), perceived monitoring by others (the belief that one's behaviors are being monitored by other people), and self-monitoring (the comparing of one's behavior to one's standards).

Method

Participants and Procedure

A total of 583 undergraduates at the University of Miami completed questionnaires in partial fulfillment of a course

requirement. All questionnaires were completed in a single testing session. Participants reported a variety of religious denominations (16.1% Protestantism, 38.9% Catholicism, 14.2% Judaism, 3.4% Islam, 1.9% Buddhism, 2.6% Hinduism, and 8.2% other). Of the sample, 1.5% did not report a religious affiliation and 13.2% selected ''none'' for their religious denomination. Participants also reported diverse ethnicities (53.2% non-Hispanic White, 20.4% Hispanic, 10.1% Asian, 5.8% African American, 10.1% other, and 0.3% did not report an ethnicity). Approximately 42.5% of participants were male.

Measures

Scales measuring religiosity. All participants filled out the Religious Commitment Inventory (RCI-10; Worthington et al., 2003), a 10-item questionnaire designed to assess participants' general commitment to their particular religious belief system. This scale has two subscales. Items on the 6-item intrapersonal commitment subscale include items such as "I spend my time trying to grow in understanding of my faith". Items on the 4-item interpersonal subscale include items such as ''I enjoy spending time with others of my religious affiliation.'' Participants rated each item using a 5-point Likert-type scale (1 = *not at all true of me* and 5 = *totally true of me*), and subscale scores were calculated as means of item responses. Mean scores were 2.04 for the interpersonal subscale (standard deviation [SD] = 0.99) and 2.14 for the intrapersonal subscale (SD = 1.12). Mean scores on the both subscales of RCI-10 were nonnormal and positively skewed, so we used a logarithmic transformation to bring them closer to normality. Participants also answered the question ''how often do you pray?'' using a 5-point Likert-type scale (1 = *never* and 5 = *every day*). Table 1 contains descriptive statistics and internal consistency reliability coefficients (α) for all variables in the present study.

Scales measuring self-control. Participants completed two questionnaires that measure aspects of self-control. The Brief Self-Control scale (Tangney, Baumeister, & Boone, 2004) has 13 items (e.g., "I am good at resisting temptation," and "People would say that I have iron self-discipline"). The Perseverance
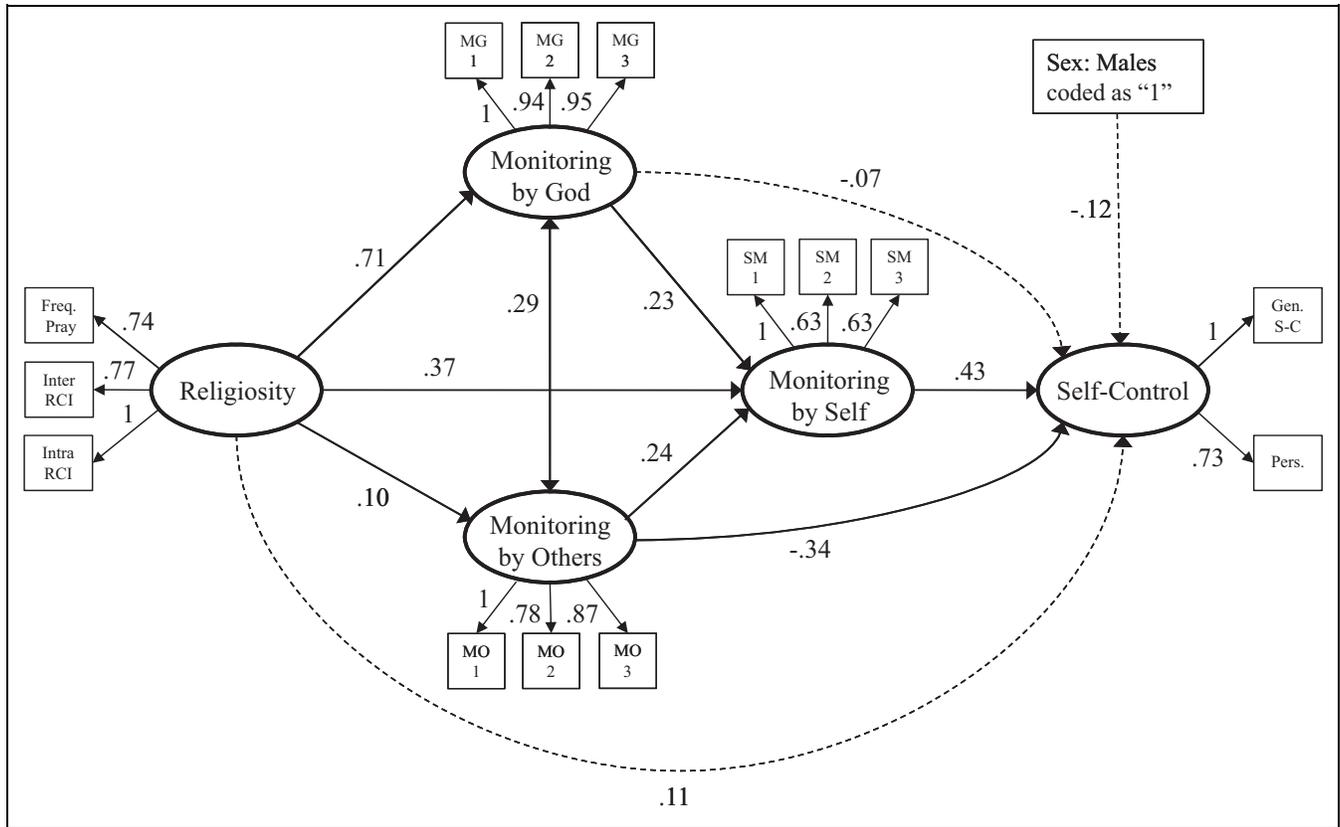
Figure 1. Structural equation model of the relationships among religiosity, three forms of monitoring, and self-control (while controlling for sex). All coefficients are standardized and solid lines indicate statistical significance.

scale, a subscale of Whiteside and Lynam's (2001) 5-factor impulsivity scale, has 10 items (e.g., "I finish what I start" and "I tend to give up easily," which is reverse coded). Participants rated each item using a 5-point Likert-type scale (1 = *not at all true of me* and 5 = *totally true of me*). Scale scores were calculated as means of item responses.

Scales measuring monitoring. Participants completed nine items about the extent to which they (a) monitor their own personal goals and values; (b) experience the feeling of being monitored by other people; and (c) feel watched by a higher power, or monitored by God (see Appendix A). Scale scores were calculated as means of item responses.

Results

Correlations

Zero-order correlations were examined for all variables (Table 1). Several findings here are noteworthy. First, the positive relationship between measures of religiosity and measures of self-control that is common in the literature (McCullough & Willoughby, 2009) was replicated: Scores on perseverance and self-control were significantly correlated with scores on interpersonal and intrapersonal religious commitment and frequency of prayer. Second, all religiosity variables were correlated with scores for both self-monitoring and monitoring

by God; only intrapersonal religious commitment was significantly associated with monitoring by others. Third, scores on the self-control scales were positively correlated with scores on self-monitoring and monitoring by god, and negatively correlated with scores for monitoring by others. The negative correlation between monitoring by others and self-control was in the opposite direction from what we had predicted.

Structural Equation Model

Next, data were analyzed with structural equation modeling (SEM) in Mplus version 4.21 (Muthén & Muthén, 1998–2004). Missing data for participant sex (this variable was inadvertently not coded for 43.2% of participants) were estimated using a default maximum likelihood estimator. Log-transformed scores for the interpersonal and intrapersonal subscales of the RCI were used along with the single-item measure of frequency of prayer to create a latent variable for religiosity. The three items within each category of monitoring were used to create latent variables measuring self-monitoring, monitoring by God, and monitoring by others. Scores on the Brief Self-Control scale and Perseverance scale were used to create a latent variable for self-control (see Figure 1 for standardized loadings).

The latent variable for self-control was regressed on all other latent variables (while controlling for sex). The latent

variable for self-monitoring was regressed on the latent variables for monitoring by God and monitoring by others. All monitoring latent variables were regressed on the latent variable for religiosity (see Figure 1 for standardized coefficients). All indirect paths between religiosity and self-monitoring and religiosity and self-control were tested.

The test of model fit was significant, $\chi^2(80, N = 583) = 216.35$, $p < .001$, indicating an imperfect fit between the model and the data; however, the chi-square test is sensitive to power and therefore may overestimate differences in large samples (Kline, 2005), such as the sample in the current study. Additional fit indices, which may be more appropriate for use with large samples, indicated that the model fit the data reasonably well: The comparative fit index (CFI) was .97, the standardized root mean square residual (SRMR) was .04, and the root mean square error of approximation (RMSEA) was .05, $p = .21$, meaning that although the estimate was .05, the RMSEA is most likely below the accepted cutoff of .05. We therefore concluded that the model in Figure 1 provided a good fit to the data.

Mediational Paths Between Religiosity and Self-Monitoring

The direct pathway between religiosity and self-monitoring was statistically significant, direct standardized coefficient = .37, $p < .001$, as was the indirect effect, total indirect coefficient = .18, $p < .01$. The indirect effect was made up of 2 specific pathways: First, religious people reported greater monitoring by God, which related to reporting more self-monitoring, indirect coefficient = .16, $p < .01$. Second, religious people also reported greater monitoring by others, which also related to reporting more self-monitoring (though this effect was small and only on the cusp of statistical significance, indirect coefficient = .02, $p = .051$).

Mediational Paths Between Religiosity and Self-Control

Recall that religiosity had significant zero-order correlations with self-control and perseverance (Table 1). SEM indicated, however, that the direct path from religiosity to self-control was not significant ($p = .20$) once the indirect paths were taken into account. The total indirect effect was significant, total indirect coefficient = .15, $p < .05$, suggesting that the relationship between religiosity and self-control was fully mediated by pathways specified in the model. The total indirect effect was made up of two significant pathways, a third that was on the cusp of significance and two more that were nonsignificant.

First, religious people were higher in self-monitoring which in turn was associated with higher self-control, indirect coefficient = .16, $p < .001$. Second, religious people reported more monitoring by God, which in turn related to higher self-monitoring, and then to higher self-control, indirect coefficient = .07, $p < .05$. Third (only marginally significant), more religious people tended to have higher scores on monitoring by others, which related to less self-control, coefficient = −.03,

$p = .052$. Fourth, more religious people tended to have a greater perception of being monitored by others, which was related to higher scores on self-monitoring, an association which in turn predicted higher on self-control; however, this indirect path was not significant ($p = .08$). Finally, the pathway from religiosity through monitoring by God to self-control was not significant ($p = .35$).

Discussion

We predicted that religious involvement would predict greater self-monitoring of one's goals and values. We also predicted that this relationship would be mediated in part by the perception that one is being monitored by God and in part by the perception that one is being monitored by other people. The first prediction was clearly supported, as was the first part of the second prediction. It is noteworthy that monitoring by God and monitoring by others only partially mediated the relationship between religiosity and self-monitoring. Thus, there remains a substantial amount of variance left to explain regarding the association between religiosity and self-monitoring.

The results also replicated the finding that self-reported religiosity is associated with self-reported self-control (McCullough & Willoughby, 2009). As hypothesized, however, SEM results were consistent with the view that the association was an indirect one through self-monitoring. Once indirect pathways associated with self-monitoring were taken into account, the direct effect of religiosity on self-control was no longer significant. Self-monitoring is theorized to be an integral aspect of goal-oriented behavior (Carver, 1974, 1975; Gendolla et al., 2008; Gibbons, 1978; Macrae et al., 1998; Scheier et al., 1974) and, thus, self-control. This theorizing is further supported by the pattern of associations found here.

It is of interest that perceptions of being observed by others had two opposing (though in both cases weak) effects. Perceptions of monitoring by others were related to higher self-monitoring, which in turn was related to greater self-control. However, the perception of being monitored by others also related directly to lower self-control. We suggest two possible interpretations for the latter effect. First, it seems possible that the items measuring monitoring by others may have assessed something akin to public self-consciousness (Fenigstein, Scheier, & Buss, 1975), a focus on how one is being viewed by others. Public self-consciousness has been associated with anxiety (Bögels, Alberts, & De Jong, 1996; Fenigstein et al., 1975; Saboonchi, Lundh, & Ost, 1999) and therefore may be negatively related to self-control (scores on the Brief Self-Control scale have been found to have a negative relationship with measures of anxiety and phobic anxiety; Tangney et al., 2004). Additionally, public self-consciousness has been associated with at least one behavior that can be thought of as reflecting low self-control: LaBrie, Pedersen, Neighbors, and Hummer (2008) reported that greater public self-consciousness was associated with more alcohol-related consequences in college students, as measured by the Rutgers Alcohol Problem Index (White & Labouvie, 1989). Another possibility is that the latter path may represent a reactance effect, by which monitoring from

other people, which could be perceived as coercive, promotes a tendency to push back and do the opposite of what one feels coerced to do (Snyder & Wicklund, 1976; Worchel, 1974). It is of interest that no such inverse effect was associated with the perception of being monitored by a higher power.

Limitations and Future Directions

There are several important limitations on the current study.[1] First, the cross-sectional nature of this study precludes definitive causal conclusions. Other structural models are also consistent with the data, and because the models are not nested, they cannot be compared statistically with one another. Lack of clarity about causal relations is further underscored by evidence from other studies. Two longitudinal studies have found that higher levels of conscientiousness and agreeableness, personality traits that are conceptually similar to self-control, predict greater religious involvement in the future (McCullough, Enders, Brion, & Jain, 2005; McCullough, Tsang, & Brion, 2003). However, there is also longitudinal and experimental evidence that religion increases self-control (Toburen & Meier, 2010; Wink, Ciciolla, Dillon, & Tracy, 2007). It may be most plausible that religion and self-control have mutual influences, and that a nonrecursive model would best represent the relationship between them. Future research should collect longitudinal and experimental data to enable more direct tests of cause and effect.

Second, the current sample has certain characteristics that may make it difficult to draw conclusions about humans in general (i.e., all participants were American university students and over 80% of participants reported following an Abrahamic religion). There is some evidence that the association between religion and self-control holds for non-American and nonuniversity student samples (Aziz & Rehman, 1996; French, Eisenberg, Vaughan, Purwono, & Suryanti, 2008; Jackson & Francis, 2004), but it has not yet been tested whether such an association is mediated by monitoring of any kind. However, based on the current findings, one might assume that the association between religiosity and self-control would be weaker in cultures where the dominant religion does not emphasize a supernatural agent capable of monitoring practitioners. Replicating the current findings in more culturally and religiously diverse samples will be an important step for future research.

Third, we were unable to evaluate whether social desirability, which is correlated (perhaps in a causal fashion; Gervais & Norenzayan, in press) with both religiosity (Trimble, 1997) and self-control (Tangney et al., 2004), played some role in our results. Future studies should address this limitation, though it is encouraging to note that Toburen and Meier (2010) reported a link between religion and self-control using experimental priming methodology, in which the nonconscious nature of the religious manipulation could potentially obviate the possibility of social desirability as a confound.

Finally, the monitoring scales we used would benefit from some modification for future research. For example, the monitoring by others scale involves an evaluative component (e.g., "I often feel as though I am being evaluated by others"), whereas the monitoring by God scale is more neutral and more about simply being observed. These differences make it difficult to interpret the pattern of associations we report. Future research is required to explore this limitation and improve the monitoring scales, though one possible direction for future work, as suggested by an anonymous reviewer, would be to make the monitoring by God and monitoring by others items more similar by having only the monitoring entity change across scales (e.g., "when I walk around, it is easy to feel as though God is looking at me" and "when I walk around, it is easy to feel as though passersby are looking at me"). Improvements such as these will increase the utility of these items for clearly assessing the role of monitoring in the association between religion and self-control.

Despite these limitations, and to our knowledge, this project offers the first evidence that religion's association with self-control can be accounted for by religion's relationship with self-monitoring—a causal mechanism about which theorists have long speculated but never tested directly (McCullough & Willoughby, 2009). Indeed, scholars since the very beginnings of the scientific study of religion have assumed that religious belief might serve a regulatory function by causing people to internalize standards and then monitor their behavior in accordance with those standards. Astonishingly, these links have never been tested directly—not even with cross-sectional, self-report data such as those we use here. Furthermore, this project offers evidence that the relationship between religion and self-monitoring can be explained in part by religion's association with monitoring by others and monitoring by God. Future directions for experimental work may benefit from focusing on these variables—for example, by experimentally inducing the feeling of being monitored by a higher power. Continued research on the connection between religion and self-control, and the variables that mediate this relationship, will increase our understanding of these important constructs.

Appendix A

Monitoring by Self, Others, and God

Please indicate how well each statement describes how you feel using the following scale:

1	2	3	4	5	6	7
Not at all						Very true

Self-Monitoring
1. I often stop at the end of the day to consider if I made progress in reaching my goals.
2. It is important for me to know when I am reaching my full potential.
3. I occasionally take moments to think about whether I am living according to my values.

Monitoring by Others
4. I often feel as though I am being evaluated by others.

5. When I walk around it is easy to feel as though passersby are looking at me.
6. I sometimes feel as though my friends are watching my every move.

Monitoring by God

7. I believe a higher power can see my behavior.
8. I believe a Supreme Being watches my actions.
9. I sometimes feel as though I am being observed by a higher power.

Declaration of Conflict of Interest

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Note

1. One anonymous reviewer pointed out that recent work has shown that simply asking participants about their religious beliefs and behaviors may act as a prime for religious cognition and thereby may elicit certain behaviors (Preston, Ritter, & Hernandez, 2010). This reviewer wondered whether our findings might be dependent on such a phenomenon. However, if the inclusion of the Religious Commitment Inventory (RCI) in the current study modified self-reported monitoring and self-control, then it presumably did so in a uniform fashion—essentially, adding a constant to every participant's self-monitoring and self-report scores. Assuming this is the case, the covariation between religiosity and the outcome variables would stay the same and none of our results would be expected to change. Nonetheless, we can only be sure that the current results are due to causal processes by conducting experimental research.

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