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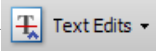
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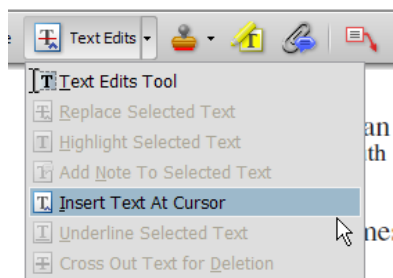
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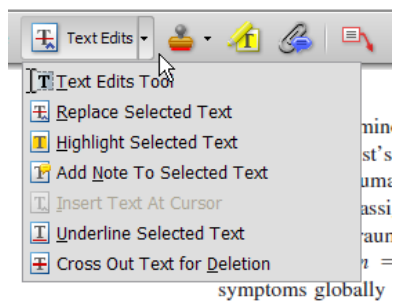
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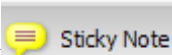
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Table 5
Experiment 4: Comparative Optimism as a Function of Self-Presentation and Event Valence

	Event					
	Positive		Negative		Total	
Self-presentation	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Public/student	3.46	0.13	3.60	0.10	3.53	0.12
Public/expert	2.66	0.12	2.78	0.13	2.73	0.13
Control	2.39	0.11	2.46	0.09	2.43	0.11
Total	2.84	0.47	2.95	0.50		

The first column's entries should be flush left (except for "Total", which should be indented one em-space), as in Tables 1 and 2 previously.

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$$du/u = -\lambda dt$$

$$u_t = ue^{-\lambda t}$$

Close up minus sign to lambda (3 times, highlighted)

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BRIEF REPORT

Religious Coping Moderates the Relationship Between Emotional Functioning and Obesity

AQ: 2

Steven Pirutinsky
Teachers College, Columbia UniversityDavid H. Rosmarin
McLean Hospital/Harvard Medical School, Belmont,
MassachusettsCheryl L. Holt
University of Maryland, College Park

Objective: Prospective research indicates that poor emotional functioning predicts obesity. The maladaptive coping hypothesis proposes that unhealthy eating is used to regulate emotion, leading to obesity. Given research suggesting that many utilize religion to cope with distress, we hypothesized that positive and negative religious coping would moderate links between emotional functioning and obesity. In addition, previous research focused on Christians and the relevance of religious coping to the Jewish context, where obesity may be of particular concern, was examined. **Method:** 212 Jewish participants completed self-report health and emotional functioning measures as well as the Jewish Religious Coping scale. **Results:** Moderation analysis indicated that negative coping had no effect, while positive coping was a significant moderator. Specifically, poor emotional functioning predicted increased obesity among those with low, but not high, positive religious coping. This effect remained even after several possible confounding factors were controlled for, and ~~was~~ the effect was large. **Conclusions:** These findings further support the maladaptive coping hypothesis, indicating that religious coping may provide an alternative strategy to maladaptive eating. They also illustrate a possible mechanism by which religiosity correlates with better health and support the relevance of religious coping to the Jewish context.

Keywords: BMI, religion, spirituality, adiposity, Jewish

Previous research demonstrates consistent links between emotional distress and obesity, including prospective studies suggesting that emotional distress is related to increased obesity over time (Goodman & Whitaker, 2002; Pine, Goldstein, Wolk, & Weissman, 2001). One explanation is the maladaptive coping hypothesis (Leventhal et al., 2010), which proposes that individuals engage in unhealthy eating behaviors to cope with negative emotions, which, in turn, causes obesity. Correlational, experimental, and clinical studies link emotional distress to unhealthy eating (e.g., consuming high-calorie or high-carbohydrate foods, eating in the absence of hunger, and binge eating), and suggest that unhealthy eating improves mood and is therefore reinforced (see Ganley, 1989). These findings are corroborated by accumulating evidence indicating that the neural mechanisms of eating and emotional regulation are overlapping and entangled (Kishi & Elmquist, 2005). One impli-

cation of the maladaptive coping hypothesis is that, among individuals who engage in alternative coping strategies, emotional functioning should not relate to increased BMI. Accordingly, Leventhal et al. (2010) reported that that poor emotional functioning was unrelated to BMI among tobacco users, suggesting that they cope by using tobacco as opposed to eating. The current research therefore explored if religious coping provides a similar alternative coping mechanism and thereby moderates the link between depression and BMI.

For many, religion provides comfort, support, and hope in times of distress (Pargament, 1997). Factor analytic research suggests that religious coping can be divided into two broad forms reflecting positive and negative strategies (Pargament, Smith, Koenig, & Perez, 1998). Positive coping includes seeking a supportive relationship with God, benevolent religious reappraisals (e.g., seeing one's situation as part of God's plan), and obtaining interpersonal religious support. By contrast, negative coping involves anger at God, passive religious deferral (e.g., not doing anything and expecting God to solve one's problems), religious doubts, and interpersonal religious struggles. Both positive and negative religious coping have garnered significant empirical attention, and multiple meta-analyses suggest that positive methods promote psychological adjustment, while negative forms increase distress (Ano & Vasconcelles, 2005; Smith, McCullough, & Poll, 2003). Accordingly, it is possible that positive religious coping may protect

Steven Pirutinsky, Department of Clinical and Counseling Psychology, Teachers College, Columbia University; David H. Rosmarin, ●●●, McLean Hospital/Harvard Medical School, Belmont, Massachusetts; Cheryl L. Holt, ●●●, University of Maryland, College Park.

Correspondence concerning this article should be addressed to Steven Pirutinsky, Department of Clinical and Counseling Psychology, Teachers College, Columbia University, Box 303, 525 West 120th Street, New York, NY 10027. E-mail: sp2813@columbia.edu

individuals with emotional distress from increased obesity by providing an alternative to unhealthy eating. Conversely, negative religious coping may exacerbate distress and strengthen ties between negative emotions and obesity. This literature, however, focuses almost exclusively on Christians, and the relevance of religious coping to the Jewish religious-culture context has yet to be established (Pirutinsky et al., in press). Moreover, while obesity is broadly recognized as a significant and growing challenge within multiple populations (e.g., Mokdad et al., 2003), some research suggests that it is of particular concern within the Jewish community (Benjamins, Rhodes, Carp, & Whitman, 2006), perhaps due to cultural factors such as increased caloric intake on Shabbat (Rosenberg, Swencionis, & Segal-Isaacson, 2010), decreased physical activity (Kahn, 2004), or discrimination-related distress (Hunte & Williams, 2009).

Therefore, the current research examined relationships between positive and negative religious coping, emotional distress, and obesity among Jews. We hypothesized that religious coping would moderate the relationship between emotional functioning and body mass index (BMI), such that among those high in positive religious coping, emotional functioning would be unrelated to BMI, while among those low in positive coping, increased emotional distress would be related to increased BMI. We also expected that, conversely, among those high in negative religious coping, poor emotional functioning would be related to increased BMI, while among those low in negative coping, increased emotional distress would be unrelated to increased BMI.

Method

Procedure and Participants

Participants were volunteers recruited through e-mails sent to distribution lists of Jewish organizations. Previous research in religious communities suggests that stigma is a barrier to research participation (Rosmarin, Pargament, Pirutinsky, & Mahoney, 2010), and therefore an anonymous Web survey was utilized. A total of 212 Jewish individuals of diverse denomination (e.g., Orthodox, Conservative, and Reform), mostly female ($n = 157$; 74.05%) across a wide age range (19 to 79 years, $M = 41.74$, $SD = 15.10$) participated. Most of the sample resided in the United States (82.5%), with minorities from Canada (6.6%), Israel (5.7%), and other countries (2.2%).

Measures

Demographics and health. Demographic and health information (e.g., age, gender, height, weight, smoking status, and level of physical activity) was collected using the Behavioral Risk Factor Surveillance System modules (Centers for Disease Control and Prevention, 2010). BMI was calculated using kg/m^2 , based on self-reported height and weight.

Emotional functioning. Emotional functioning was measured using the Mental Health Component Summary score of the Short Form Health Survey (Gandek et al., 1998). This 12-item scale measures emotional functioning and has excellent reliability and validity (Gandek et al., 1998). Scores range from 0 to 100, with higher scores indicating better functioning.

Religious Coping. We utilized the 12-item Jewish Religious Coping Scale (JCOPE), which has previously demonstrated reliability and validity (Rosmarin, Pargament, Krumrei, & Flannelly, 2009). Participants rated how frequently they generally engaged in religious methods of coping on a 5-point scale. Items included “I try to see how God may be trying to teach me something,” “I question my religious beliefs, faith and practices,” and “I look for a stronger connection with God.” Internal consistency was high (positive $\alpha = .90$; negative $\alpha = .81$).

Statistical Analysis

To test our hypothesis that obesity would correlate with emotional functioning, and that this relationship would be moderated by religious coping, we conducted a multiple regression analysis as described by Aiken and West (1991). This regression included the main effects of both emotional functioning and religious coping (Step 1) and a multiplicative interaction term that assessed if the effect of emotional functioning varied by the level of positive and negative coping (Step 2). Post hoc t tests on the slope of emotional functioning at various levels of the moderator were also conducted. Additional hierarchical regressions included possible demographic and religious moderators, as well as potential confounding covariates.

Results

Overall, BMI ($M = 27.56$, $SD = 7.00$, range 17–62), and emotional functioning ($M = 45.04$, $SD = 7.55$, range 20–62) in the sample were comparable to the general U.S. population (Ogden, Fryar, Carroll, & Flegal, 2004; Ware, Snow, Kosinski, & Gandek, 1993), and religious coping was similar to previously reported means in Jewish samples (positive $M = 45.48$, $SD = 8.67$, range 18–60; negative $M = 8.53$, $SD = 3.39$, range 4–20; Rosmarin et al., 2009). Zero-order correlations between variables indicated that emotional functioning and BMI were negatively correlated, $r(202) = -.20$, $p = .004$, positive religious coping was unrelated to emotional functioning, $r(213) = .07$, $p = .32$, and BMI, $r(202) = -.01$, $p = .84$, and negative religious coping was unrelated to emotional functioning, $r(213) = -.06$, $p = .37$, and BMI, $r(202) = .03$, $p = .63$. Thus, religious coping was not independently correlated with either emotional functioning or with BMI.

To assess our moderation hypothesis, we conducted multiple regression analyses. Results indicated that emotional functioning and positive religious coping significantly interacted, whereas negative religious coping was unrelated to BMI (see Table 1). A plot of this interaction (see Figure 1) and follow-up post hoc tests suggested that among those low in positive coping (1 SD below the mean), decreased emotional functioning was significantly related to increased BMI, $\beta = -.32$, $t = 3.85$, $p < .001$, while among those with high positive coping (1 SD above the mean), emotional functioning was not significantly related to BMI, $\beta = .03$, $t = .28$, $p = .78$. Additional regression models indicated that this moderation effect did not vary by gender, $\Delta R^2 = .06$, $F(6, 180) = 1.98$, $p = .07$, religious affiliation, $\Delta R^2 = .04$, $F(6, 161) = 1.23$, $p = .29$, or age, $\Delta R^2 < .001$, $F(6, 185) = .03$, $p = .87$. Furthermore, positive religious coping’s moderating effect increased in significance and size after several correlates of BMI (age, smoking

Table 1
Religious Coping Moderates the Relationship Between Emotional Functioning and BMI

Variable	B	SE B	β	t	p
Constant	77.67	19.64			
Emotional Functioning	-1.10	.42	-1.19	2.65	.009
Positive Coping	-.83	.34	-1.03	2.46	.02
Negative Coping	-.54	.90	-.25	.60	.55
Positive \times Health	.02	.01	1.40	2.51	.02
Negative \times Health	.01	.02	.27	.60	.55

Note. Model $R^2 = .07$, $F(5, 196) = 3.02$, $p = .01$.

status, physical health, and level of physical activity) were controlled for, $\Delta R^2 = .24$, $F(5, 73) = 5.47$, $p < .001$, $f^2 = .38$.

Discussion

In this study, we hypothesized that religious coping may provide an alternative to unhealthy eating in the regulation of negative emotions and therefore protect individuals from obesity. We explored this possibility within a Jewish sample. Consistent with a coping model, religious coping had no independent effect on emotional functioning or obesity, yet positive religious coping moderated the relationship between these variables, such that among those high in positive coping, emotional functioning was unrelated to obesity, while among those low in positive coping,

decreased functioning was related to clinical levels of obesity. Negative religious coping was unrelated to emotional functioning and obesity, suggesting that maladaptive eating is not specifically exacerbated by spiritual struggles. Results were highly significant with a large effect size after potential confounding variables were controlled for.

These results provide further support for the maladaptive coping hypothesis (Leventhal et al., 2010), suggesting that alternative coping strategies may moderate the relationship between emotional functioning and obesity. More specifically, our findings indicate that religious coping may provide an alternative coping strategy that buffers against maladaptive eating. This may be one mechanism by which religiosity correlates with better health (Koenig, McCullough, & Larson, 2001). Our results also support the relevance of religious coping to a Jewish context, suggesting that the appropriate and sensitive use of religious strategies may effectively prevent maladaptive health behavior within this population. In particular, CBT-based interventions have established efficacy for obesity (e.g., Melchionda et al., 2003), and recent research suggests that Jewish religiosity can be successfully integrated into cognitive treatments (Rosmarin et al., 2010).

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This study was limited by exclusive reliance on self-report measures, including BMI. However, self-report and objectively measured height and weight are highly concordant in adults (Spencer, Appleby, Davey, & Key, 2002). In addition, the sample was exclusively Jewish, although of diverse denomination, and the generalizability of our findings to other religious cultures is lim-

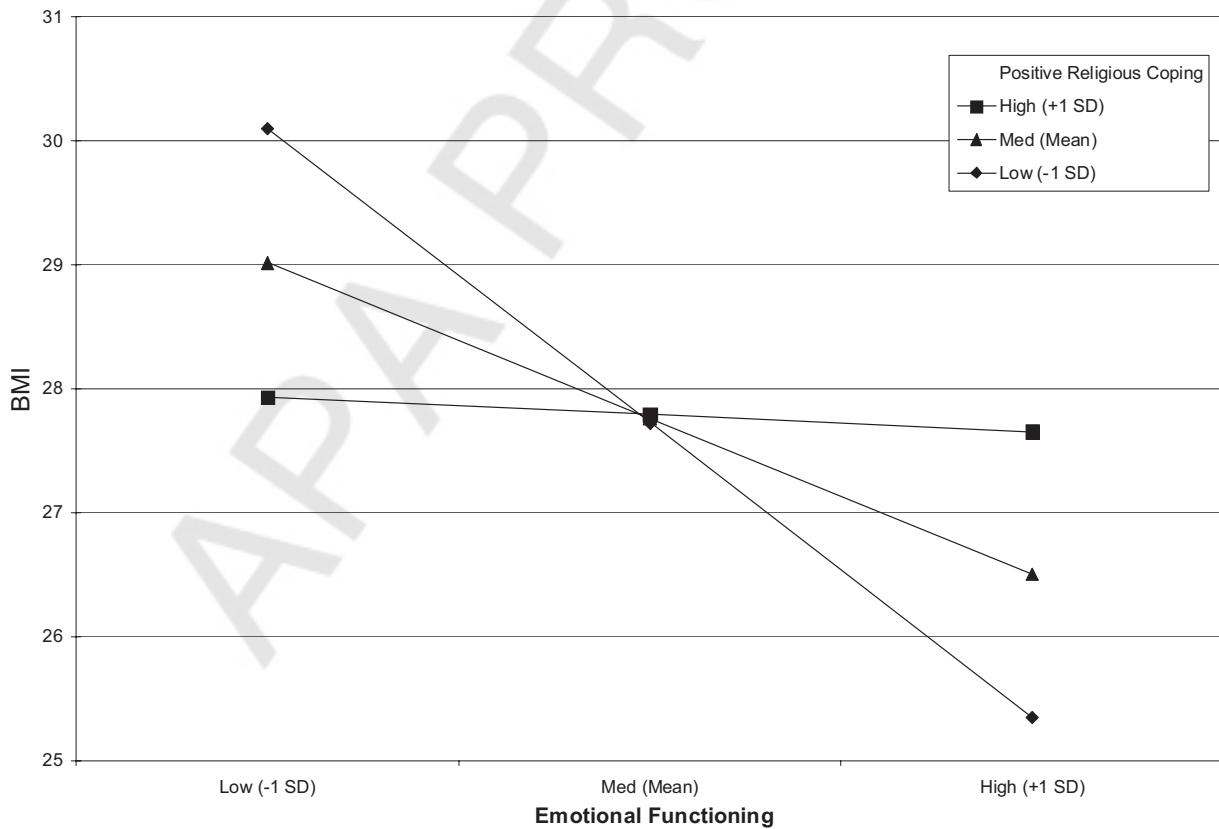


Figure 1. Moderating effect of positive religious coping.

ited. Moreover, the cross-sectional design does not allow causal conclusions, and it is possible that the relationship occurs in the opposite direction, such that obesity leads to poor emotional functioning and religious coping moderates this relationship. Nevertheless, our findings support the relevance of religious coping to health behaviors, uphold the maladaptive coping hypothesis, and suggest a possible mechanism for the religion–health connection.

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AUTHOR QUERIES


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1

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