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Does social support mediate the moderating effect of intrinsic religiosity on the relationship between physical health and depressive symptoms among Jews?

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Abstract Previous research in the general population suggests that intrinsic religiosity moderates (mitigates) the effect of poor physical health on depression. However, few studies have focused specifically on the Jewish community. We therefore examined these variables in a cross-sectional sample of 89 Orthodox and 123 non-Orthodox Jews. Based on previous research suggesting that non-Orthodox Judaism values religious mental states (e.g., beliefs) less and a collectivist social religiosity more, as compared to Orthodox Judaism, we hypothesized that the moderating effect of intrinsic religiosity would be mediated by social support among non-Orthodox but not Orthodox Jews. As predicted, results indicated that the relationship between physical health and depression was moderated by intrinsic religiosity in the sample as a whole. Furthermore, this effect was mediated by social support among non-Orthodox Jews, but not among the Orthodox. The importance of examining religious affiliation and potential mediators in research on spirituality and health is discussed.

Keywords Spirituality · Depression · Judaism · Social support · Illness

A substantial body of research indicates that individuals with chronic illnesses, pain, or physical disabilities have higher rates of depressive symptoms (Moussavi et al. 2007; Keawe'aimoku et al. 2003) and that chronic physical conditions and depression are frequently comorbid (Mathers 2001). Furthermore, a number of longitudinal studies have demonstrated that chronic disease, poor self-perceived health, and functional limitations are associated with future episodes of depression (Vink et al. 2008). As a result, there has been a long-standing interest in identifying protective factors that ameliorate the influence of poor physical health on depressive symptoms. One factor identified by previous research is religion (e.g., Pargament 1997), which multiple studies now suggest significantly ties with lower depressive symptoms among the chronically ill (Koenig et al. 2001a, b). In fact, although religiosity generally correlates with lower depressive symptoms, it appears to be particularly salutary among individuals experiencing high amounts of life stress such as the physically ill (Smith et al. 2003).

However, the influence of religion on human functioning is not monolithic and likely fluctuates dependent on the attitudes, beliefs, and behaviors espoused by an individual's faith (Pirutinsky 2009). Indeed, some suggest that religion, like geographic origin or ethnic identity, is best understood as a source of cultural influence with a diverse and varied impact (Cohen 2009), and it is therefore important to examine the meaning of religion within particular groups, since generalizations may be inaccurate. Moreover, even within broad religious categories (e.g., Christians, Jews, Muslims) there may be within group variations in belief and culture that alter the importance of

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religious factors to health. Furthermore, not all forms of religion appear equally adaptive. One widely studied distinction is between extrinsic religiosity, which involves using religion as a means to an end (e.g., church membership to establish a place within a community) and intrinsic religiosity, defined as a sincere and intentional integration of religion into one's life (Allport and Ross 1967). Meta-analytic findings suggest that measures of intrinsic religiosity correlate with lower depressive symptoms, while measures of extrinsic religiosity correlate with greater risk (Smith et al. 2003).

While some have studied the mediating pathways through which intrinsic religiosity exerts these effects (e.g., Ardelt and Koenig 2009), the mechanisms are not fully established and may vary across religious affiliations. One possibility is that intrinsic religiosity itself acts as a psychological resource, by encouraging protective religious mental states (e.g., Pargament 1997). However, beyond these mental processes, research suggest that religious individuals have more social contact (Putnam 2000) and that social support is protective against depression (Ane-shensel and Stone 1982; Stice et al. 2004). Accordingly, intrinsic religiosity may ameliorate stress and influence depressive symptoms through increased social support (Koenig et al. 2001a, b). Although extrinsic religiosity may also increase social contact, intrinsic religiosity appears to provide more effective social support (Salsman et al. 2005), perhaps because relationships formed in the context of a shared religious worldview are particularly accessible and protective in times of stress (Ai et al. 2009). Consequently, given possible variation in the psychological effects of religious beliefs across religious groups and the paucity of research in the Jewish context (Schnall 2006), we explored the protective effect of intrinsic religiosity and the possible mediating role of social support in the context of poor physical health among Jews.

Jewish religious culture

Over the past two centuries, the Jewish community has divided into various sub-groups defined by religious and cultural differences. A primary distinction can be made between Orthodox and non-Orthodox Judaism. Orthodox Judaism is premised on acceptance of a divinely originated Torah (Hebrew Bible) and adherence to the 613 biblical commandants, as interpreted in the Talmud and applied to all aspects of daily life (Schnall 2006). Orthodox Jewish doctrine and culture also focuses explicitly on religious mental states such as belief in an afterlife (Pirutinsky 2009) and a personal relationship with God founded upon faith and trust (Rosmarin et al. 2009). Within the health context, Orthodox Judaism views physical illness as a God-given

message and challenge, which can lead to spiritual and religious growth (Leyser 1994). Accordingly, limited previous research suggests that among Orthodox Jews, religious mental states, such as belief in God's benevolence and utilization of religious coping strategies, are strongly related to better mental health, while among non-Orthodox Jews these appear unrelated (Rosmarin et al. 2009).

In contrast, non-Orthodox Judaism does not require strict adherence to specific laws and beliefs, instead emphasizing interpersonal ethics, social action (*"Tikun Olam"*), and communal participation over mental states. Thus, some argue that non-Orthodox Judaism represents a collectivist religion focused on the expression of religiosity through social interrelation (Cohen and Hill 2007). Accordingly, limited research suggests that religious mental states are largely irrelevant to psychological functioning among non-Orthodox Jews (Cohen 2002). Applied to the current context, given that non-Orthodox Judaism emphasizes religious social involvement over mental states, intrinsic religiosity may not *directly* protect against the stress of physical illness among non-Orthodox Jews. Instead, intrinsic religiosity may moderate the effects of poor physical health among non-Orthodox Jews by providing accessible and effective social support, which in turn protects against depression. Restated, social support may fully mediate the moderating effect of intrinsic religiosity among non-Orthodox Jews. On the other hand, among Orthodox Jews, who focus on religious mental states and practices over social connection, intrinsic religiosity is likely *directly* relevant and social support may not mediate this effect.

In summary, consistent with previous research in the general population, we expected that intrinsic religiosity would moderate, or mitigate, the effects of physical health on depressive symptoms among both Orthodox and non-Orthodox Jews, such that among those high in intrinsic religiosity, poor physical health would be less related to depressive symptoms (Hypothesis 1). However, consistent with the existing theoretical and empirical distinctions between non-Orthodox and Orthodox Judaism, we also hypothesized that the moderating effect of intrinsic religiosity would be mediated by social support among non-Orthodox Jews, but not among the Orthodox (Hypothesis 2).

Method

Participants and procedures

Participants were recruited to participate in a study of "Religion, Spirituality and Health in the Jewish Community" through e-mails sent to distribution lists of Orthodox & non-Orthodox Jewish organizations (e.g., Aish HaTorah,

Hebrew Union College), and internet-based advertising on Jewish Internet outlets (e.g., synagogue announcement groups, event listings, discussion forums). Participants were volunteers who were not paid for their participation. Analyses were completed with data supplied by those who reported known Orthodox affiliations (Hassidic = 5, Yeshiva Orthodox = 45, Modern Orthodox = 69, Sephardic-Religious = 2; Chabad/Lubavitch = 2) or non-Orthodox affiliations (Conservative = 32, Reform = 30, Reconstructionist = 5, Humanistic = 3, Sephardic-Traditional = 3, Other Jewish = 14). A total of 212 participants (123 Orthodox and 89 non-Orthodox) completed an internet-based survey containing all measures. The majority of the sample was female ($n = 157$; 74.05%) and participants ranged in age from 19 to 79 years ($M = 41.74$, $SD = 15.10$). Most of the sample resided in the U.S. (82.5%), with smaller proportions from Canada (6.6%), Israel (5.7%), and other countries (2.2%). The resulting non-Orthodox and Orthodox groups did not differ in terms of age ($t(120) = .11$, $P = .74$), country ($\chi^2(10) = 12.00$, $P = .28$) or gender ($\chi^2(1) = 2.61$, $P = .11$).

Measures

Intrinsic religiosity

Intrinsic religiosity was measured using the three item intrinsic religiosity subscale from the Duke Religion Index (Koenig et al. 1997). These items read “My religious beliefs are what really lie behind my whole approach to life”, “In my life, I experience the presence of the Divine (i.e., God)”, and “I try hard to carry my religion over into all other dealings in life”. These were rated on a five point scale ranging from “Definitely not true” to “Definitely true”. This scale has demonstrated adequate internal consistency ($\alpha = .78$), test–retest reliability ($ICC = .91$), and correlation with similar measures (Storch et al. 2004). Furthermore, unlike many measures of intrinsic religiosity, such as Allport and Ross’s (1967) Religious Orientation Scale, this index does not include items specifically referring to individual, emotional, or social-based motivations for religion, which may be inappropriate in the Jewish context (Cohen et al. 2005). Internal reliability in the sample was high ($\alpha = .87$).

Physical health

Physical health was measured using the Physical Component Summary score of the Short Form Health Survey (SF-12; Gandek et al. 1998; Ware et al. 1996). This 12 item self-report scale, derived from the 36-item Short Form Health Survey (SF-36), measures physical functioning and

bodily pain. It has demonstrated excellent test–retest reliability and construct validity, and correlates highly with SF-36 scores (Gandek et al. 1998; Ware et al. 1996). Scores range from 0 to 100, with lower scores indicating poorer health and functioning.

Depressive symptoms

Depressive symptoms were assessed using a short form of the Center for Epidemiologic Studies Depression Scale (CES-D; Radloff 1977). This scale contains 10 items and has been validated extensively as a measure of depressive symptoms (e.g., Andresen et al. 1994). Scores range from 0 to 30, and scores of 10 or above indicate clinically significant levels of depression. Internal consistency in the current sample was high ($\alpha = .89$).

Social support

Perceived social support was examined using a single item measure previously used in numerous studies analyzing the national Behavioral Risk Factor Surveillance System survey data (Nelson et al. 2001), which asked participants: “How often do you get the social and emotional support you need? Please include support from any source”. This item was scored on a five point scale consisting of “Never”, “Rarely”, “Sometimes”, “Usually”, and “Always”.

Statistical method

To assess whether intrinsic religiosity moderated the effect of poor physical health on depression in the sample as a whole (Hypothesis 1), we utilized multiple regression using mean-subtracted (centered) variables (Aiken and West 1991). This regression included the main effects of both poor physical health and intrinsic religiosity (Step 1) and a multiplicative interaction term examining if the effect of poor physical health was moderated by the level of intrinsic religiosity (Step 2). We conducted an additional regression analysis examining if the strength of this moderation effect differed between Orthodox and non-Orthodox participants.

To determine whether higher social support may explain, or mediate, the moderating effect of intrinsic religiosity, and whether this relationship differed across Orthodox and non-Orthodox Jews (Hypothesis 2), we utilized the causal steps approach of Baron and Kenny (1986), as adapted to the mediated moderation context by Muller et al. (2005).¹ Thus, we tested regression models examin-

¹ In the present paper, *moderation* describes how the level of intrinsic religiosity alters the effect of poor physical health on depression, while *mediation* describes the pathway through which intrinsic religiosity impacts depressive symptoms by relating with greater social support. This pattern is referred to as *mediated moderation* and was

Table 1 Descriptive statistics

	Orthodox		non-Orthodox		<i>t</i>	<i>d</i>
	<i>M</i>	SD	<i>M</i>	SD		
Intrinsic religiosity	13.25	2.14	10.99	3.32	6.03*	.81
Physical health	31.08	7.27	33.12	9.22	1.80	.25
Depressive symptoms	18.18	6.50	18.71	6.56	.58	.08
Social support	3.61	.96	3.60	.88	.10	.01

* $P < .001$; $df = 210$ for *t* tests

Table 2 The moderating effect of intrinsic religiosity on depression in the context of physical health

Variable	Step 1			Step 2		
	<i>B</i>	SE <i>B</i>	β	<i>B</i>	SE <i>B</i>	β
Intrinsic religiosity	-.57***	.14	-.24	-.59***	.14	-.27
Physical health	-.24***	.05	-.30	-.25***	.05	-.31
Religiosity \times health				.06**	.02	.20
ΔR^2	.15			.04		
<i>F</i> for ΔR^2	18.43***			9.56**		

** $P < .01$; *** $P < .001$

ing whether: (1) the moderating effect of intrinsic religiosity was related to higher social support (Path a) (2) higher social support was related to lower depressive symptoms (Path b) and (3) if the moderating effect of intrinsic religiosity was attenuated once social support was controlled for (Path c') within each group.

Results

Descriptive statistics for all study variables are presented in Table 1. Orthodox and non-Orthodox participants reported equivalent levels of physical health, depression and social support; however, Orthodox Jews reported higher levels of intrinsic religiosity.

In regards to Hypothesis 1, results revealed that lower intrinsic religiosity and lower physical health did independently predict higher depressive symptoms (Table 2). Furthermore, these factors interacted such that intrinsic religiosity moderated (mitigated) the relationship of physical health difficulties on depression. This moderation effect did not differ significantly between Orthodox and non-Orthodox participants ($\Delta R^2 = .01$, $F(4, 201) = .43$,

$P = .79$). To examine the nature of this interaction, we plotted model predictions for depressive symptoms at various levels of intrinsic religiosity and physical health for both Orthodox and non-Orthodox participants (Fig. 1). Examination of the plot and post-hoc tests revealed that among those low in intrinsic religiosity (1 SD below the mean) lower physical health significantly related to higher depressive symptoms ($B = -.42$, $t(208) = 5.53$, $P < .001$), while among those with high intrinsic religiosity (1 SD above the mean) physical health was not significantly related to depressive symptoms ($B = -.08$, $t(208) = 1.06$, $P = .29$). Consistent with previous findings in the general population, these results suggest that intrinsic religiosity may protect against (moderate) the effects of poor physical health on depression among both Orthodox and non-Orthodox Jews. Moreover, model predictions for those with low intrinsic religiosity and poor physical health fell in the clinically depressed range (CESD > 10). In contrast, predictions for those with high intrinsic religiosity were below the clinical threshold (CESD < 8), suggesting that intrinsic religiosity may moderate even clinically significant levels of symptoms. Given the large number of females in the sample, we ran an additional regression examining gender effects and found no interaction ($\Delta R^2 = .008$, $F(4, 201) = .5$, $P = .74$).

In regards to Hypothesis 2 (Fig. 2), among non-Orthodox Jews, the moderating effect of intrinsic religiosity related to higher social support ($\beta = .21$, $t(85) = 2.03$, $P < .05$; Path a), and this higher social support was related to lower depressive symptoms ($\beta = -.34$, $t(85) = 3.24$,

Footnote 1 continued

analyzed in a manner identical to the causal steps method for simple mediation, except that the interaction (religiosity by health) was entered as the predictor variable and the main effects (religiosity and health) were treated as covariates (see Kenny 2009 for a discussion). For concision, full descriptions of the mediated moderation models are not included but are available by contacting the first author.

Fig. 1 Moderating effect of intrinsic religiosity (IR)

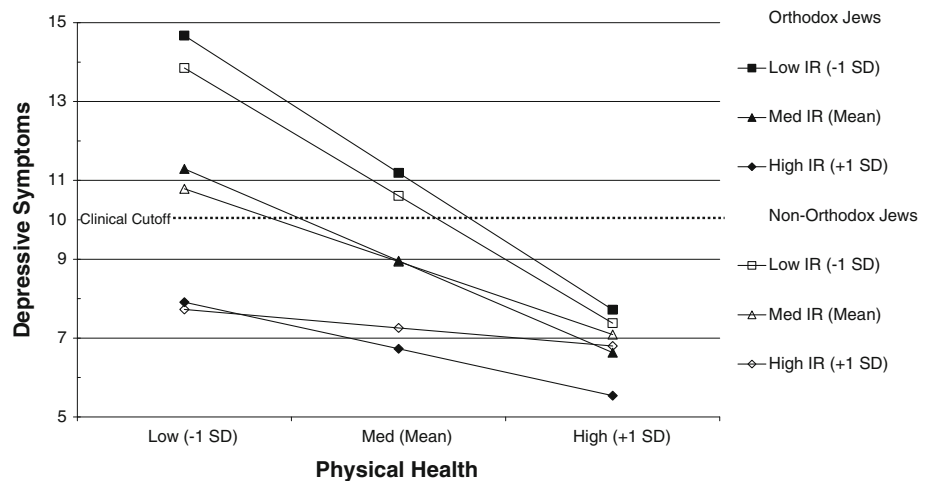
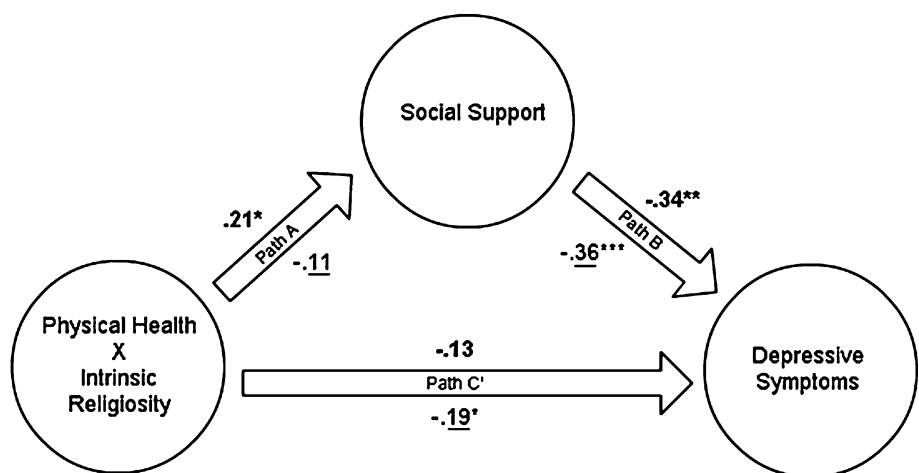


Fig. 2 Social support as a mediator of the moderating effect of intrinsic religiosity. Note: **Bold values** represent standardized regression coefficients among the non-Orthodox. Underlined values represent standardized coefficients among the Orthodox. * $P < .05$, ** $P < .02$, *** $P < .001$



$P = .002$; Path b). Moreover, once we controlled for social support, intrinsic religiosity no longer significantly moderated the relationship between poor physical health and depressive symptoms ($\beta = -.13$, $t(85) = 1.27$, $P = .21$; Path c'), suggesting that the moderating effect of intrinsic religiosity was fully mediated by higher social support. A bias-corrected bootstrapping analysis of the mediation model (Preacher and Hayes 2008; 1,000 sub-samples, 95% CI) confirmed these findings as the indirect effect of social support (Path a via b) significantly differed from 0 ($-.06$ through $-.004$).

In contrast, among Orthodox Jews, the moderating effect of intrinsic religiosity was not significantly associated with social support ($\beta = -.11$, $t(119) = 1.15$, $P = .25$; Path a). Furthermore, while higher social support was related to lower depressive symptoms ($\beta = -.36$, $t(119) = 4.62$, $P < .001$; Path b), intrinsic religiosity remained a significant moderator of the effects of poor physical health on depressive symptoms even after controlling for social support ($\beta = -.19$, $t(119) = 2.35$, $P = .02$; Path c'). These findings too were confirmed using a bias-corrected

bootstrapping analysis of the mediation model (Preacher and Hayes 2008; 1,000 sub-samples, 95% CI: $-.01$ through $.04$). These results suggest that although social support independently related to depressive symptoms among Orthodox Jewish participants, it did not mediate the moderating effect of intrinsic religiosity on depression.

Discussion

It is widely acknowledged that chronic illnesses, poor health, and functional limitations are risk factors for depression, and a considerable body of research demonstrates that for some individuals, religion provides a key protective resource against these effects (Koenig et al. 2001a, b; Smith et al. 2003). However, religious constructs have varying salience and meaning across groups (Spilka et al. 2003). Consequently, the current research examined the role of intrinsic religiosity as a moderator of the relationship between poor physical health and depression among non-Orthodox and Orthodox Jews. Results indi-

cated that among both Orthodox and non-Orthodox Jewish participants, intrinsic religiosity moderated (weakened) the effect of poor physical health on depression. However, the mediating pathway of this effect differed such that it was fully mediated by social support among non-Orthodox participants, but unrelated among the Orthodox.

Thus, consistent with our expectation (Hypothesis 1), intrinsic religiosity had a robust moderating effect on depression in the context of physical health, as our model accounted for over 19% of the variance in depressive symptoms. In fact, among those high in intrinsic religiosity, poor physical health was unrelated to depression, while among those low in intrinsic religiosity, an equivalent degree of poor physical health related to clinically significant symptoms. This suggests that among both Orthodox and non-Orthodox Jews with high levels of intrinsic religiosity, poor physical health is not a risk factor for developing depressive symptoms, and that intrinsic religiosity may ameliorate even clinical levels of depression. However, although intrinsic religiosity appeared equally effective for Orthodox and non-Orthodox participants, consistent with previous research (e.g., Rosmarin et al. 2009), Orthodox participants reported significantly higher levels of intrinsic religiosity. These results parallel previous findings within the general population (e.g., Smith et al. 2003), such as those of Wink et al. (2005), who found that poor physical health predicted higher levels of depression only among individuals low in religiousness, while among those high in religiousness, physical health status was unrelated to depressive symptoms. Jewish religious culture also appears to influence other aspects of health, such as stigmatization of medical conditions (Pirutinsky et al. 2010), treatment seeking (Pirutinsky et al. 2009), and medical decision-making (Coleman-Brueckheimer et al. 2009). Thus, further research into the relevance of religious and spiritual variables to behavioral health in the Jewish context is warranted.

In addition, previous research suggests that the effect of intrinsic religiosity may be mediated by greater social support (Koenig et al. 2001a, b). For example, Salsman et al. (2005) found that intrinsic, and not extrinsic, religiousness was associated with greater life satisfaction and less psychological distress, and that this effect was partially mediated by social support. However, our results indicated that the mediating role of social support differed between Orthodox and non-Orthodox Jews (Hypothesis 2). Among non-Orthodox Jews, higher intrinsic religiosity was related to higher social support, which in turn appeared to be protective against depression. In contrast, for Orthodox Jews, while social support was a significant predictor of depression, it was unrelated to intrinsic religiosity. These findings suggest that even apparently equivalent effects

within a single category (Jewish) can involve divergent processes that are consistent with religious-culture differences. As discussed above, non-Orthodox Judaism focuses on religious social interaction more than beliefs (Cohen and Hill 2007) and consistently the effects of religiosity were fully mediated by greater social support. In contrast, Orthodox Judaism emphasizes religious beliefs and practices over social connection, and accordingly the moderating effect of religiosity was not mediated by social support. Rather, intrinsic religiosity directly moderated the impact of poor physical health, perhaps by encouraging religious reappraisals of adversity (Leyser 1994; Rosmarin et al. 2009), promoting hopeful outcome expectancies (Sethi and Seligman 1993), and supporting a comforting relationship with God (Pargament 1997).

Beyond implications for health among Jews, these findings suggest that religiosity cannot be understood as a unitary construct exerting equal effects across groups. It is therefore unsurprising that although considerable research supports the relevance of religion and spirituality to health and psychological functioning, there are many contradictory findings (e.g., Gall et al. 2009; McCullough et al. 1999; Nelson et al. 2002). Given religion's diversity, unraveling these complex mechanisms requires a contextual approach that carefully explores the particular religious processes relevant to the area under study. It is unlikely that research using cursory measures (e.g., frequency of religious service attendance) and heterogeneous samples will enhance our understanding of religion and health.

This study was limited by its reliance on an internet-based survey, which may limit the participation of the more traditional subsets within Orthodox Judaism who do not generally utilize the internet (Barzilai-Nahon and Barzilai 2005). In addition, women were overrepresented in our sample, although the effects of gender were not significant, and the sample did not differ significantly from the American Jewish population in terms of age, education, marital status, and income (United Jewish Communities 2003). Also, the present study examined only a single possible mechanism of the moderating effect of religiosity (social support) using self-report measures and a cross-sectional design. Future studies could evaluate the extent to which other religious and non-religious processes mediate these relationships, using more comprehensive measures and longitudinal or experimental designs allowing causal conclusions. Moreover, this study addressed only the Jewish context, and there is a need to examine the influence of religious culture on spirituality and health connections within other communities. Nevertheless, the present research highlights the need to carefully consider the effects of religiosity and its moderators and mediators within a particular religious-culture context.

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