CrossMark

Mastery, self-esteem, and optimism mediate the link between religiousness and spirituality and postpartum depression

A. C. D. Cheadle[1] · C. Dunkel Schetter[2]

Abstract Religious and spiritual beliefs and behaviors are powerful influences in the everyday lives of people worldwide and are especially salient for women and families around the birth of a child. A growing body of research indicates that aspects of religiousness and spirituality are associated with mental health including lower risk of postpartum depression, a disorder that affects as many as 1 in 5 women after birth. The mechanisms, however, are not well understood. In this study, psychosocial resources (mastery, self-esteem, and optimism) was tested as a mechanism linking religiousness and spirituality with depressive symptoms in 2399 postpartum women from the Community Child Health Network. Results indicated that religiousness and spirituality each predicted lower depressive symptoms throughout the first year postpartum. Psychosocial resources mediated these associations. Our findings contribute to existing knowledge by establishing psychological resources as mechanisms explaining how religiousness and spirituality influence mental health in women postpartum.

Keywords Religion · Spirituality · Postpartum depression · Psychosocial resources · Maternal health

✉ A. C. D. Cheadle
cheadle@hope.edu

C. Dunkel Schetter
dunkel@psych.ucla.edu

[1] Hope College, Holland, MI, USA

[2] UCLA, Los Angeles, CA, USA

Introduction

Affective disorders are more prevalent during pregnancy and postpartum than at other times in women's lives (O'hara & McCabe, 2013) and have serious consequences for women, families, and infants (Abrams & Curran, 2007; Beck, 1995; Beck, 2002; Field et al., 1985; Murray & Cooper, 1996; Paul et al., 2013; Pearlstein, 2015; Spoozak et al., 2009). Given the serious consequences of prenatal and postpartum affective disorders, it is critical to identify aspects of women's lives that can prevent and ameliorate symptoms of depression during the postpartum period.

Religiousness, spirituality, and health

A growing body of research shows that various aspects of religiousness and spirituality (R/S) are associated with better physical and mental health in general and depression and depressive symptoms more specifically (Cheadle & Dunkel Schetter, 2017; cf. Smith et al., 2003). It is of particular interest to study the associations of religiousness or spirituality with depression in pregnancy and postpartum because pregnancy and childbirth are times in the lives of women and families when these beliefs and behaviors are quite salient and affective disorders are prevalent and impactful.

Mechanisms

Despite evidence suggesting that religiousness and spirituality may reduce risk of depressive mood and disorder, little is known about how this might occur. As we outlined in a recent paper (Cheadle & Dunkel Schetter, 2017), several mechanisms have been proposed that draw on research linking religiousness and spirituality to social,

behavioral, biological, and psychological processes also tied to better health. In particular, theoretical and empirical evidence suggests that religiousness and spirituality are associated with greater psychosocial resources, namely with more dispositional optimism, mastery, self-esteem, gratitude, and forgivingness. As these psychosocial resources are also robustly associated with better mental and physical health, we and others have proposed that they are possible mechanisms explaining the links between religiousness and spirituality and health (Cheadle & Dunkel Schetter, 2017). Examining these mechanisms can help us to understand the role of religiousness and spirituality as resources in the pregnancy and postpartum periods.

Religiousness, spirituality, and postpartum health

Many religions attach spiritual significance to childbirth and becoming a parent, viewing parenthood as the purpose of marriage and treating the family as the unit of religious practice (Onedera, 2008). Furthermore, many mothers and fathers view pregnancy, childbirth, and parenthood through religious and spiritual lenses as evidenced by frequent use of spiritual and religious terms like "divine" and "transcendent" in pregnancy and birth narratives (Klassen, 2001; Mahoney et al., 2009). In addition, the birth of a child often stimulates family discussions and decisions regarding religious rituals surrounding birth (e.g., baptism, brit milah), and parental decision making about future religious rearing of children (Onedera, 2008). The enhanced salience of religiousness and spirituality during pregnancy and the postpartum period make this an important time to study effects of these concepts.

In general, there is very little research on the role of religiousness and spirituality in maternal mental health during pregnancy or postpartum. A few quantitative studies provide evidence that religiousness and spirituality are associated with less depression or fewer depressive symptoms during pregnancy (Jesse & Swanson, 2007; Jesse et al., 2005; cf. Giurgescu & Murn, 2016), but there has been more attention to the role of religiousness and spirituality in postpartum depression.

Postpartum depression

Qualitative studies suggest that postpartum women use religious and spiritual resources to help cope with symptoms of postpartum depression (Amankwaa, 2003; Crockett et al., 2008; Keefe et al., 2016; Zittel-Palamara et al., 2009). Additionally, a small literature shows that religious participation and spiritual behaviors and experiences are associated with lower risk of postpartum depression. For example, a prospective study of over 300 women found that prenatal levels of organized religious participation predicted lower postpartum depressive symptoms at 6 weeks postpartum when controlling for antenatal depressive symptoms (Mann et al., 2007). More recently, research with an African American sample found that both religiosity and spirituality independently predicted favorable trajectories of depressive symptoms such that women higher in religiousness and spirituality had no change in depressive symptoms from birth to 6 months whereas women low in either had increases in depressive symptoms over the 6 months after the birth of their children (Cheadle et al., 2015). Another recent study examined religious commitment and postpartum depression in a sample of over 100 women. In this study by Clements and colleagues (2016), religious commitment predicted lower symptoms of postpartum depression in cross sectional analyses at 6 months postpartum over and above social support.

This small literature, along with studies demonstrating that religiousness and spirituality are associated with lower symptoms of depression in the general population (Baetz et al., 2006; Jacobs et al., 2012; Mofidi et al., 2006; Sternthal et al., 2010; Smith et al., 2003), strongly suggests religiousness and spirituality have implications for depression in the postpartum period. There are clear theoretical distinctions between being spiritual and being religious, and some unique effects of each on mental health (Cheadle & Dunkel Schetter, 2017). Thus, it is important to consider religiousness and spirituality individually as well as together.

Hypotheses

First, we hypothesized that religiousness and spirituality would predict more favorable trajectories of depressive symptoms over the year after birth. That is, those higher in religiousness and/or spirituality would have smaller increases in depressive symptoms over the postpartum period. Second, we hypothesized that these associations of religiousness and spirituality with depressive symptoms would be mediated by three core psychosocial resources. Specifically, we hypothesized that women higher in religiousness and spirituality would have higher levels of mastery, optimism, and self-esteem and that those resources, in turn, would be associated with favorable trajectories of depressive symptoms. Furthermore, if structural equation modeling revealed distinct pathways from religiousness or spirituality to depressive symptoms, we were also interested in formulating separate models of these processes to test whether religiousness and spirituality additively and uniquely each predict depressive symptoms.

Methods

Overview of the Community Child Health Network

Data were collected by the Community Child Health Network (CCHN), a community- based participatory research network composed of collaborating sites in Los Angeles, Chicago, Washington, D.C., Baltimore, and eastern North Carolina (see Dunkel Schetter et al., 2013; Ramey et al., 2015 for details). Women in each site were recruited in hospitals following birth of a baby with the exception of eastern North Carolina where they were recruited in clinics during pregnancy or postpartum. Mothers were screened for the following inclusion criteria: 18–40 years of age, residence in one of the identified communities for at least 6 months, ability to complete interviews in either English or Spanish, having four or fewer children including a new infant, and no plans to be surgically sterilized after childbirth. CCHN's recruitment plan oversampled for African-American and Latina race/ethnicity, preterm birth status, and by design was a low SES sample based on the site selection and catchment areas. Trained staff conducted interviews in the home at three time points postpartum: 2–16 weeks (Time 1, T1), 6–10 months (Time 2, T2), and 12–15 months (Time 3, T3). Study visits lasted 1–2 h and participants were compensated for their time. Interviews were designed by academic and community stakeholders and included multiple measures of stress and resilience, physical and mental health, and demographics including sociodemographic background. Measures were spread across three interview time points so as to reduce participation burden, thus, not all measures were repeated at each time point. The study protocol was approved by the review boards of each participating site.

Sample

In total, CCHN had a final sample of 2399 maternal participants (Ramey et al., 2015). Of these, 2287 (95%) women completed the T1 interview, 1604 (67%) completed the T2 interview, and 1588 (66%) participants completed the T3 Interview. There were no differences in terms of key study variables (indicators of religiousness, spirituality, mastery, optimism, self-esteem, depressive symptoms at T1, income, years of education) between women who did and did complete the T3 interview; however, women who completed the all three time points were, on average, older than the women who only completed T1 (26.0 vs. 25.2 years old).

Measures

Demographic measures

Race/ethnicity Participants self-reported their primary racial/ethnic identification at the time of study enrollment as African American/Black, White/Caucasian or Latina/ Hispanic.

Household income Household income was recorded during the T1 1 month postpartum study visit by interview. Participants reported a range using ordered categories in which their household income fell in the previous calendar year (pre-tax). The midpoint value for each category was used to create a continuous gross household income variable. Per capita household income was computed by dividing gross household income by the number of household members. Due to variability in the cost of living across the five study sites, per capita household income was adjusted using cost of living indices available from the US Census Bureau. This variable was truncated at $70,000 and because the distribution was not normally distributed, a log transformation was calculated for use in analyses (see "Results" section for descriptive data on this variable).

Depressive symptoms

At all three home study visits over the first year (T1, T2, T3), the Edinburgh Postnatal Depression Scale (EPDS; Cox et al., 1987) was administered to participants verbally or as a written questionnaire. The EPDS is a screening instrument validated for use during the first year postpartum by both mothers and fathers and consists of 10 items that pertain to the severity of common depressive symptoms (e.g., difficulty sleeping due to unhappiness, not looking forward with enjoyment to things). Respondents were asked to choose one of four responses that best described how they had been feeling in the past 7 days. Total possible scale scores range from 0 to 30. The Cronbach alpha coefficients for the scale were above 0.80 at each timepoint in this sample. In addition, a depression index was created which categorized respondents as *not depressed* (scores 0–8), *possible depression* (scores 9–12), or *probable depression* (scores of 13 or greater, or endorsement of suicidal thoughts) based on existing guidelines for the EPDS.

Measures of religiousness and spirituality

At 6 months postpartum (T2), participants were asked various questions about religiosity and spirituality. Measures were adapted by community participatory methods within CCHN from scales published in the Fetzer Mul-

tidimensional Measurement of Religiousness/Spirituality for Use in Health Research (MMRS; Fetzer/NIA, 1999). Additional questions regarding religiousness and spirituality were assessed at 12 months postpartum (T3).

At T2 (6 months postpartum), participants were asked four questions about religiousness beginning with, "Do you have any specific religious background?" and "Do you currently identify with or belong to any particular religious group?" and selected responses from a list. Current *religious affiliation* and *religious background* were dichotomized to represent having an affiliation or not. Those participants who identified with a current religious affiliation were asked about *religious service attendance*, "How often do you usually attend religious services?" Responses on a 6-point scale ranged from *nearly everyday—4 or more times a week* [sic] to *never*. All participants were asked, "To what extent do you consider yourself a religious person?…"; responses on a 4-point scale ranged from *very religious* to *not religious at all*. This item was used as a single item indicator of *religious identity*.

Also at 6 months postpartum (T2), participants were asked to what extent they find strength and comfort in their religion, feel deep inner peace or harmony, and experience a divine presence in their lives. Each of these three items were rated on a 6-point scale with responses ranging from *never or almost never* to *many times a day*. Only participants who identified with a current religious affiliation and indicated that they attended religious services at least a few times per year were asked about finding strength and comfort in their religion (for purposes of composite creation, scores missing on the item assessing strength and comfort in one's religion due to no religious affiliation were imputed as follows: if a participant had no religious background in addition to no current religious affiliation, that participant was assumed to find no strength or comfort from religion and was assigned a score of 0 corresponding to *never or almost never*; if a participant did have a religious background though no current affiliation, that participant was assigned a score of the mean of the participant's responses to the other two items from the Daily Spiritual Experiences scale). Scores on these three items were averaged to create an index of *daily spiritual experiences*. All participants were also asked, "To what extent do you consider yourself a spiritual person?…"; responses on a 4-point scale ranged from *very spiritual* to *not spiritual at all*. This item was used a single item indicator of *spiritual identity*.

At 12 months postpartum (T3), a series of questions about religious beliefs and behaviors were asked. Questions were taken from a religiosity scale developed for use with African American women (Lukwago et al., 2001). To develop an index of *private religious behaviors*, the count of three items, "Do you agree or disagree with the fol-

lowing statements?"…"I often read religious books, magazines, and pamphlets.", "I often watch or listen to religious programs on TV or radio.", and "I pray often." was summed.

Psychosocial resource measures

Mastery At 1 month postpartum (T1), mastery was assessed using the 7-item Mastery Scale (Pearlin & Schooler, 1978). This scale was modified slightly for use in CCHN; items were administered in a set with six other items assessing self-esteem. Responses were given on a 5-point scale ranging from *strongly disagree* to *strongly agree*. Two negatively worded items were reverse coded and all items were summed to create a total mastery score, such that higher scores reflect greater mastery.

Self-esteem A 6-item modified version of the 10-item Rosenberg Self-Esteem Scale was used to assess trait self-esteem at T1 (Rosenberg, 1965). The response scale used to assess self-esteem was identical to those described above for the Mastery scale. Negatively worded items were reverse scored and all items were summed to generate a total self-esteem score such that higher scores on this scale reflect greater self-esteem.

Dispositional optimism Dispositional optimism was measured at T2 using the 8-item Life Orientation Test (Scheier & Carver, 1985). Responses were on a 5-point scale ranging from *I agree a lot* to *I disagree a lot*. Four filler items were embedded in the scale. All positively worded items were reverse coded and all non-filler items were summed to generate a total optimism score such that higher scores indicate greater optimism.

Data analysis

First, frequencies and descriptive statistics were used to summarize data on demographics, depressive symptoms, religiousness and spirituality, and psychosocial resources. Correlational analyses and ANOVAs were used to test bivariate associations between demographic variables, depressive symptoms total scores at each timepoint, religiousness and spirituality, and psychosocial resources.

Lastly, structural equation models using maximum likelihood estimation were used to test hypotheses for each step of mediation: (1) that religiousness and spirituality would predict depressive symptoms over time during the postpartum, (2) that religiousness and spirituality would predict psychosocial resources, the proposed mediator, (3) that psychosocial resources would predict depressive symptoms, and (4) that the association of religiousness and spirituality with depressive symptoms would be mediated by psychosocial resources. Finally, to test whether reli-

giousness and spirituality independently predicted depressive symptoms, the final model was estimated twice more, once with only indicators of religiousness as a predictor and once with only indicators of spirituality as a predictor. Maximum likelihood estimation allowed for utilization of all available data and participants regardless of missingness (Enders, 2010). Statistical analyses were conducted using Stata 13/14 (StataCorp, 2013, 2015) and MPlus 7 (Muthén & Muthén, 2015) was used for all structural equation models. An RMSEA less than 0.06 was considered to indicate excellent model fit and a CFI around 0.95 was considered to indicate good model fit (Hu & Bentler, 1999).

Results

Descriptive statistics

Demographic measures

Participants' ages ranged from 18 to 42 and, on average, participants were about 26 years old ($M = 25.71$, SD = 5.69). The majority of participants identified as African American (53.7%) and the remaining participants were White (21.8%) and Latina (24.6%). Participants had attended an average of nearly 13 years of schooling ($M = 12.93$, SD = 2.98), equivalent to just beyond high school, and participants had an average per capita household income of around $15,000 ($M = $14,936.22$). The average per capita household income adjusted for the cost of living in the individual study sites was slightly lower ($M = $12,358.71$).

Depressive symptoms

At 1 month after birth, the mean EPDS score was 4.62 (SD = 4.62) and a majority (84.5%) of mothers were categorized as non-depressed. Almost 8% (7.9%) of mothers' scores fell between 9 and 12, or in the possible depression range, and 7.6% of mothers had scores above 12 and were categorized as probably depressed at time of the T1 visit. Mean EPDS scores did not increase substantially from T1 to T2 ($M = 5.01$) or T3 ($M = 4.81$). At T2, a majority of mothers were categorized as non-depressed (84.5%), 8% of mothers had possible depression, and nearly 9% (8.6%) of women were categorized as probably depressed. At T3, a majority of women were categorized as non-depressed (83.1%), 7% of women were categorized as possibly depressed, and nearly 10% (9.8%) were categorized as probably depressed. Thus, although most mothers were likely not depressed, a small but important percentage of women were possibly or probably depressed at each timepoint. Depressive symptom data were missing for 17% of the sample at the first study visit and for 40% of the sample at the respective visits with the increase attributable to sample attrition.

Religiousness and spirituality

At 6 months after birth, 64% of the sample declared a religious affiliation and, on average, participants reported attending religious services a few times a year to a few times a month ($M = 3.75$, SD = 1.07). Thus, these women were slightly less religious than the general population, but similar to people of this generational cohort (Pew Forum on Religion & Public Life, 2008; 2015). Participants rated themselves as *slightly* to *moderately* religious ($M = 2.56$, SD = 0.93) and reported engaging in about half of the private religious behaviors surveyed ($M = 1.56$, SD = 1.13). Participants rated themselves as more spiritual than religious with the average rating corresponding to *moderately* spiritual ($M = 2.83$, SD = 0.87). On average, participants reported having spiritual experiences *most days* ($M = 4.10$, SD = 1.04) with finding strength and comfort in religion being the most common spiritual experience ($M = 4.45$, SD = 1.25). Religiousness and spirituality data were missing for 40–60% of the sample with missingness attributable to sample attrition at the second and third timepoints as well as skip logic inherent to the design of the interview.

Psychosocial resources

On average, participants had a total score of 28 on the Mastery Scale ($M = 28.06$, SD = 4.08), representing that they *agree* with each statement on average ($\alpha = 0.703$). Self-esteem was also high with an average total score of nearly 26 ($M = 25.90$, SD = 3.15), representing that participants *agree* to *strongly agree* with most statements ($\alpha = 0.800$). On average, total optimism scores were around 31 out of a total possible score of 40 ($M = 31.07$, SD = 5.15) representing an average response of *I neither agree nor disagree* to *I agree a little* to each statement ($\alpha = 0.670$).

Structural equation models

Models were estimated in the full sample of 2399 women using maximum likelihood to account for missing values. Based on bivariate associations, income was included as a covariate in all models. Use of antidepressants, history of depression diagnosis, relationship status, and race/ethnicity

were tested as possible covariates but were not significantly related to key variables in models.

Religiousness/spirituality and depressive symptoms

To determine whether a religiousness/spirituality combined factor predicted depressive symptoms, structural equation modeling was used. In preliminary models, modification indices (LaGrange Multiplier tests) suggested inclusion of theoretically consistent modifications, that is, adding correlations among indicators of the latent variable representing religiousness and spirituality (four total: spiritual identity with religious identity, religious attendance with private religious behavior, religious attendance with religious identity, and private religious behavior with religious identity). These modifications were maintained in all following models where relevant.

Trajectories of depressive symptoms A longitudinal growth curve (LGC) model in which a latent factor of religiousness/spirituality predicted women's trajectories of depressive symptoms over the first year of their babies' lives was tested with the established modifications and with income as a covariate. This model had acceptable fit (CFI = 0.926; RMSEA = 0.055) and all of the factor loadings and regression coefficients were significant excepting the effect of income on depression slope. The R/S factor significantly predicted a lower intercept of depressive symptoms ($\beta = -0.182$, $p < 0.001$) as well as a negative or decreasing slope, or trajectory, of depressive symptoms from 1 to 6 to 12 months postpartum ($\beta = -0.135$, $p = 0.037$). The effect of income on the slope of depression was marginal ($\beta = -0.088$, $p = 0.055$) and in the expected direction.

Depressive symptoms throughout the postpartum year Because trajectories of depressive symptoms did not vary substantially between participants, the association of religiousness/spirituality and depressive symptoms was also tested using a latent factor of depressive symptoms created by using EPDS scores at each timepoint as indicators. This model was run with established modifications and with income as a covariate. This model had acceptable fit in the data (CFI = 0.934; RMSEA = 0.051). All factor loadings and regression coefficients were significant, and in particular, the religiousness and spirituality factor predicted lower levels of depressive symptoms as indexed by the latent factor ($\beta = -0.236$, $p < 0.001$). Income was associated with lower depressive symptoms as indexed by the latent factor ($\beta = -0.124$, $p < 0.001$). See Fig. 1 for detailed coefficients and fit statistics.

Mediation by psychosocial resources

Religiousness/spirituality and psychosocial resources As a preliminary step to testing our mediation hypothesis, we first assessed whether religiousness/spirituality, the predictor, was associated with psychosocial resources, the proposed mediator. Structural equation modeling was used to model latent factors for religiousness/spirituality and psychosocial resources and their association. In preliminary models, modification indices (LaGrange Multiplier tests) suggested inclusion of one correlation between indicators of the latent variable representing psychosocial resources (self-esteem with mastery). Additionally, modifications established earlier were included and income was included as a covariate. The final model had acceptable fit to the data (CFI = 0.936; RMSEA = 0.057) and all factor loadings were significant. The association of religiousness/spirituality and psychosocial resources was significant and positive ($\beta = 0.412$, $p < 0.001$). Income was associated with higher religiousness/spirituality ($\beta = 0.089$, $p = 0.002$).

Psychosocial resources and depressive symptoms Models were run to test whether the proposed mediator, psychosocial resources, predicted depressive symptoms. Because the slope of depressive symptoms did not vary adequately to test prediction of the slope, we tested the association of psychosocial resources to depressive symptoms as indexed by a latent factor. The model was run with relevant established modifications and with income as a covariate predicting depressive symptoms. This model had good fit in the data (CFI = 0.961; RMSEA = 0.071) and all factor loadings and regression coefficients were significant. Depressive symptoms were predicted negatively by psychosocial resources as indexed by a latent factor ($\beta = -0.850$, $p < 0.001$) and, unexpectedly, positively by income ($\beta = 0.073$, $p = 0.007$).

Mediation model Lastly, the full hypothesized mediation model was tested to determine whether the association of religiousness and spirituality to depressive symptoms as indexed by a single latent factor would be explained by psychosocial resources.

The mediation model was tested using the modifications established in previous models. This model evidenced good fit (CFI = 0.938; RMSEA = 0.053) and all factor loadings and regression coefficients were significant. In particular, the total effect of religiousness and spirituality on depressive symptoms was significant and in the expected direction ($\beta = -0.248$, $p < 0.001$) as was the effect of psychosocial resources on depressive symptoms ($\beta = -0.882$, $p < 0.001$). In order to determine whether there was evidence for mediation, the direct and indirect effects of religiousness and spirituality on depressive symptoms were calculated. Interestingly, the direct effect
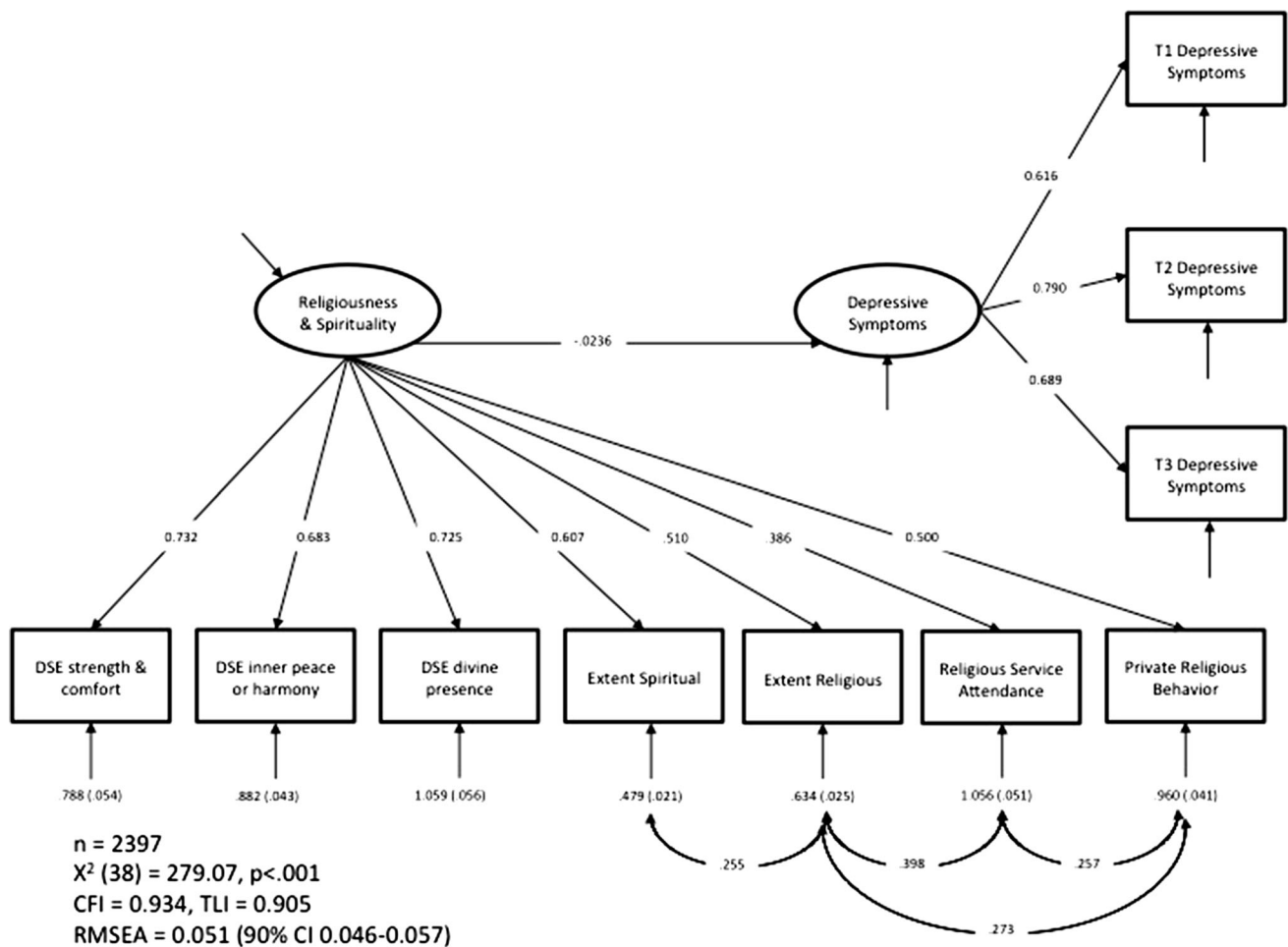
Fig. 1 Structural equation model of the association of religiousness and spirituality and depressive symptoms

of religiousness and spirituality on depressive symptoms was positive ($\beta = 0.127$, $p = 0.001$) whereas the indirect effect of religiousness and spirituality on depressive symptoms through psychosocial resources was negative ($\beta = -0.375$, $p < 0.001$). This pattern of effects is indicative of "inconsistent mediation" which is a type of mediation distinct from consistent mediation (in which the direct and mediated effects have the same sign; MacKinnon et al., 2000). See Fig. 2 for coefficients and detailed fit statistics.

Exploration of religiousness and spirituality separately

To address the possibility that religiousness and spirituality would separately predict depressive symptoms and that these his associations would be mediated by psychosocial resources, the final model of the latent factor of depressive symptoms was estimated twice more, once with the four measures of religiousness constituting a latent factor indexing religiousness and once with the three measures of spirituality constituting a latent factor of spirituality.

In the full mediation model which had good fit (CFI = 0.959; RMSEA = 0.055), religiousness alone did predict depressive symptoms indexed by a latent factor (total effect, $\beta = -0.108$, $p = 0.001$) as did psychosocial resources ($\beta = -0.831$, $p < 0.001$). However, the direct effect of religiousness was near zero with psychosocial resources in the model ($\beta = -0.002$, $p = 0.958$). The indirect effect of religiousness through psychosocial resources was also significant ($\beta = -0.109$, $p < 0.001$), evidencing nearly full mediation.

In the full mediation model which had acceptable fit (CFI = 0.945; RMSEA = 0.060), spirituality alone predicted lower depressive symptoms indexed by a latent factor (total effect, $\beta = -0.274$, $p < 0.001$) as did psychosocial resources ($\beta = -0.903$, $p < 0.001$). However, the direct effect of spirituality was positive with psychosocial resources in the model ($\beta = 0.160$, $p < 0.001$). The indirect effect of religiousness through psychosocial resources was also significant but negative ($\beta = -0.434$, $p < 0.001$), evidencing inconsistent mediation.
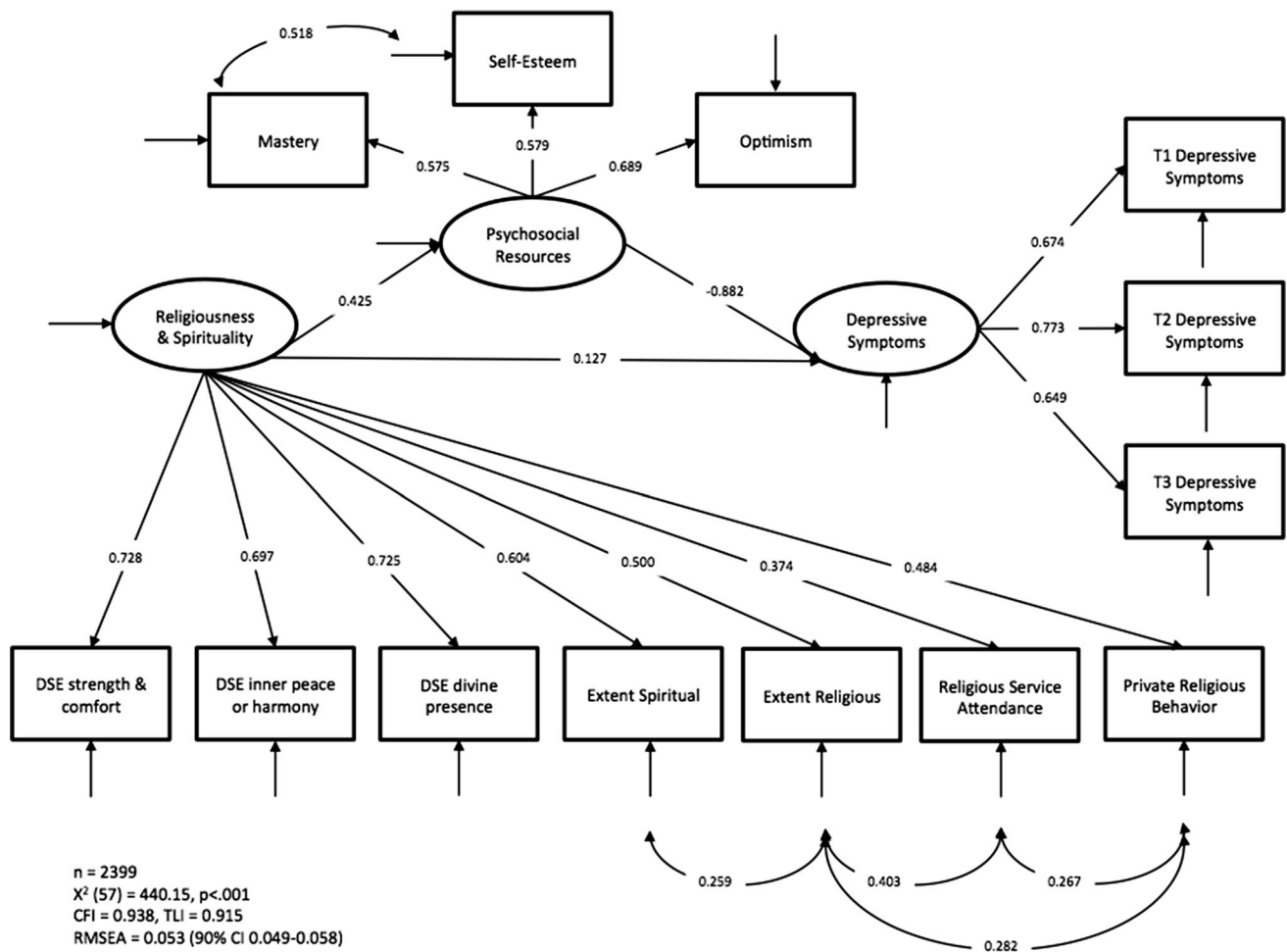
Fig. 2 Structural equation model of psychosocial resources mediating the association of religiousness and spirituality and depressive symptoms

Discussion

Consistent with our first hypothesis, indicators of religiousness and spirituality, when combined into one latent factor, predicted a decreasing trajectory of depressive symptoms from 1 to 6 months postpartum and from 6 to 12 months as well. In addition, the latent factor combining religiousness and spirituality predicted lower scores on a latent depressive symptoms factor which was a combination of symptom scores at 1, 6, and 12 months.

Consistent with our second hypothesis, the psychosocial resources latent factor mediated the observed association between the latent religiousness/spirituality factor and depressive symptoms aggregated over the 11 months. That is, postpartum women who were more religious and spiritual had significantly higher levels of mastery, optimism, and self-esteem, and these psychosocial resources, in turn, predicted significantly lower depressive symptoms.

We also examined whether religiousness and spirituality would separately predict depression. As hypothesized, both

religiousness and spirituality each individually predicted fewer depressive symptoms, and both of these associations were mediated by psychosocial resources. The sizes of the effects differed somewhat with spirituality having a stronger effect.

These findings are all novel and add to our existing knowledge of protection from depression following birth and to our knowledge of psychosocial resources as well as spirituality and religiosity as resilience factors (Dunkel Schetter & Dolbier, 2011).

Postpartum depression

A handful of studies have documented associations of religiousness and spirituality with depression in postpartum women, but these studies have been limited by small samples and measurement of spirituality with single item or single dimension measures (Mann et al., 2007; Jesse & Swanson, 2007; Jesse et al., 2005). Our study indicates the importance of these factors for postpartum mental health.

Religiousness and spirituality are among the strongest resources people possess in the United States and especially among women (Pew Forum on Religion & Public Life, 2015). Having a child is often a religious and spiritual experience for families and women in particular. Taking into account the religious and spiritual beliefs and behaviors of new and expecting mothers may offer new inroads into maternal/child health. Addressing these factors with women could have important protective effects for postpartum depressive symptoms, and thus, for women, children, and families.

Religiousness, spirituality, and health

There is a strong literature that shows a negative association of religiousness on depressive symptoms (Smith et al., 2003), albeit a small effect size, yet very few studies have tested similar effects of spirituality (Baetz et al., 2006; Miller et al., 2012; Mofidi et al., 2006; Sternthal et al., 2010). We did so and found spirituality on its own predicted depressive symptoms. Moreover, this study produced new evidence consistent with a mediational pathway for associations of both religiousness and spirituality with depressive symptoms via higher psychosocial resources. Though two other studies have shown that individual psychosocial resources mediate associations of individual aspects of religiousness and/or spirituality and mental health in small samples (Le et al., 2007; Simoni & Ortiz, 2003), this study is the first to show mediation by multiple psychosocial resources. In all of these ways, the work is novel.

Second, that people who are more religious and spiritual are higher in personal resources is an important finding for those who hope to understand the complexity of how religion and spirituality play out in everyday life and health. We know that mastery, self esteem and an optimistic outlook enable people to manage stress and function better on a daily basis. Over time, these resources translate into better measureable health outcomes. These findings raise interesting questions about how religious and spiritual experience and participation may generate or increase these resources. For example, future research could investigate the time course of the association of religious and spiritual experiences and psychosocial resource generation.

Strengths and limitations

This study had several methodological strengths. First, multiple measures of both religiousness and spirituality allowed for creating a latent factor and also examining each separately. Although there are notable exception, previous studies generally examine associations of one or the other and even of only particular dimensions of reli-

giousness or spirituality—often religious service attendance alone—with health and markers of health,. Furthermore, validated scale measures of multiple psychosocial resources permitted testing a multidimensional psychosocial resources latent factor as the mediator of associations of religiousness and health. Again this is in contrast to much of the existing research that typically considers only one psychosocial resource at a time as a mediator in religiousness and spirituality and health mechanisms (cf., Simoni & Ortiz, 2003).

Finally, the CCHN sample is unique in terms of its racial and ethnic diversity and its focus on women of low socioeconomic status; in all ways, these are individuals for whom religiousness and spirituality may be especially relevant (Rees, 2009) and they are groups infrequently studied. Community-participatory methods enabled researchers to recruit and conduct assessments in homes and study a group not often recruited or retained. The longitudinal nature of the study is also a strength as it allowed for multiple assessments of the study outcomes including depressive symptoms. The longitudinal design of the study also posed some limitations. Missing data percentages were high for some key variables. In order to account for missing data, structural equation modeling with maximum likelihood estimation was used, thus, missing data should not impact the findings of the studies (Enders, 2010).

Importantly, this and other studies do not establish a causal link between religiousness and spirituality and psychosocial resources or depressive symptoms. It will be useful for future studies to investigate the longitudinal associations of religiousness, spirituality, psychosocial resources, and health outcomes, if any, as well as third variable causes not typically controlled for in such investigations such as genetic factors and personality.

Future directions

The novel methods used here to assess the mediation of the effect of multiple dimensions of religiousness and spirituality and test multiple psychosocial resources can be employed in future studies for which this general hypothesis is of interest. In addition, future research on associations of religiousness and spirituality and psychosocial resources could contribute substantially by determining the causal direction of this association through further longitudinal specific designs and by expanding to other mental and physical health outcomes. With further research, we may be able to target efforts to improve physical and mental health through these mechanisms for pregnant and postpartum women and others. Some research suggests that church-based health interventions are effective for improving health behaviors and physical health (e.g.,

Voorhees et al., 1996; cf. Peterson, Atwood, & Yates, 2002) and even mental health (Hankerson & Weissman, 2012). This may be an avenue for future interventions with women at risk for postpartum depression.

Compliance with ethical standards

Conflict of interest A. C. D. Cheadle and C. Dunkel Schetter declare that they have no conflict of interest.

Human and animal rights and Informed consent All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional research committees and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. Informed consent was obtained from all individual participants included in the study.

References

Abrams, L. S., & Curran, L. (2007). Not just a middle-class affliction: Crafting a social work research agenda on postpartum depression. *Health and Social Work, 32,* 289–296.

Amankwaa, L. C. (2003). Postpartum depression among African–American women. *Issues in Mental Health Nursing, 24,* 297–316.

Baetz, M., Bowen, R., Jones, G., & Koru-Sengul, T. (2006). How spiritual values and worship attendance relate to psychiatric disorders in the Canadian population. *Canadian Journal of Psychiatry, 51,* 654–661.

Beck, C. T. (1995). The effects of postpartum depression on maternal–infant interaction: A meta-analysis. *Nursing Research, 44,* 298–304.

Beck, C. T. (2002). Postpartum depression: A metasynthesis. *Qualitative Health Research, 12,* 453–472. https://doi.org/10.1177/104973202129120016

Cheadle, A. C., & Dunkel Schetter, C. (2017). Untangling the mechanisms underlying the links between religiousness, spirituality, and better health. *Social and Personality Psychology Compass, 11,* 1–10.

Cheadle, A. C. D., Dunkel Schetter, C., Gaines Lanzi, R., Reed Vance, M., Sahadeo, L. S., Shalowitz, M. U., et al. (2015). Spiritual and religious resources in African American women: Protection from depressive symptoms after childbirth. *Clinical Psychological Science.* https://doi.org/10.1177/2167702614531581

Clements, A. D., Fletcher, T. R., Childress, L. D., Montgomery, R. A., & Bailey, B. A. (2016). Social support, religious commitment, and depressive symptoms in pregnant and postpartum women. *Journal of Reproductive and Infant Psychology, 34,* 247–259.

Cox, J. L., Holden, J. M., & Sagovsky, R. (1987). Detection of postnatal depression. Development of the 10-item Edinburgh Postnatal Depression Scale. *The British Journal of Psychiatry, 150,* 782–786.

Crockett, K., Zlotnick, C., Davis, M., Payne, N., & Washington, R. (2008). A depression preventive intervention for rural low-income African–American pregnant women at risk for postpartum depression. *Archives of Women's Mental Health, 11,* 319–325.

Dunkel Schetter, C., & Dolbier, C. (2011). Resilience in the context of chronic stress and health in adults. *Social and Personality Psychology Compass, 5,* 634–652.

Dunkel Schetter, C., Schafer, P., Lanzi, R. G., Clark-Kauffman, E., Raju, T. N., & Hillemeier, M. M. (2013). Shedding light on the mechanisms underlying health disparities through community participatory methods: The stress pathway. *Perspectives on Psychological Science, 8,* 613–633.

Enders, C. K. (2010). *Applied missing data analysis*. New York: Guilford Press.

Fetzer/NIA Working Group. (1999). *Multidemensional measurement of religiousness/spirituality for use in health research*. Kalamazoo, MI: John E. Fetzer Institute.

Field, T., Sandberg, D., Garcia, R., Vega-Lahr, N., Goldstein, S., & Guy, L. (1985). Pregnancy problems, postpartum depression, and early mother-infant interactions. *Developmental Psychology, 23,* 1152–1156.

Giurgescu, C., & Murn, N. L. (2016). Church member support benefits psychological well-being of pregnant African American women. *Journal of Christian Nursing, 33,* 87–91.

Hankerson, S. H., & Weissman, M. M. (2012). Church-based health programs for mental disorders among African Americans: A review. *Psychiatric Services, 63,* 243–249.

Hu, L. T., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling, 6,* 1–55.

Jacobs, M., Miller, L., Wickramaratne, P., Gameroff, M. J., & Weissman, M. M. (2012). Family religion and psychopathology in children of depressed mothers: Ten-year follow-up. *Journal of Affective Disorders, 136,* 320–327. https://doi.org/10.1016/j.jad.2011.11.030

Jesse, D. E., & Swanson, M. S. (2007). Risks and resources associated with antepartum risk for depression among rural southern women. *Nursing Research, 56,* 378–386. https://doi.org/10.1097/01.NNR.0000299856.98170.19

Jesse, D. E., Walcott-McQuigg, J., Mariella, A., & Swanson, M. S. (2005). Risks and protective factors associated with symptoms of depression in low-income African American and Caucasian women during pregnancy. *Journal of Midwifery & Women's Health, 50,* 405–410. https://doi.org/10.1016/j.jmwh.2005.05.001

Keefe, R. H., Brownstein-Evans, C., Lane, S. D., Carter, D. B., & Polmanteer, R. S. R. (2016). Postpartum depression and the Affordable Care Act: Recommendations for social work educators. *Advances in Social Work, 16,* 202–213.

Klassen, P. (2001). *Blessed events: Religion and home birth in America*. Princeton: Princeton University Press.

Le, T. N., Tov, W., & Taylor, J. (2007). Religiousness and depressive symptoms in five ethnic adolescent groups. *International Journal for the Psychology of Religion, 17,* 209–232. https://doi.org/10.1080/10508610701402259

Lukwago, S. N., Kreuter, M. W., Bucholtz, D. C., Holt, C. L., & Clark, E. M. (2001). Development and validation of brief scales to measure collectivism, religiosity, racial pride, and time orientation in urban African American women. *Family & Community Health, 24,* 63–71.

MacKinnon, D. P., Krull, J. L., & Lockwood, C. M. (2000). Equivalence of the mediation, confounding and suppression effect. *Prevention Science, 1*(4), 173–181.

Mahoney, A., Pargament, K. I., & DeMaris, A. (2009). Couples viewing marriage and pregnancy through the lens of the sacred: A descriptive study. *Research in the Social Scientific Study of Religion, 20,* 1–45.

Mann, J. R., McKeown, R. E., Bacon, J., Vesselinov, R., & Bush, F. (2007). Religiosity, spirituality, and depressive symptoms in pregnant women. *The International Journal of Psychiatry in Medicine, 37,* 301–313. https://doi.org/10.2190/PM.37.3.g

Miller, L., Wickramaratne, P., Gameroff, M. J., Sage, M., Tenke, C. E., & Weissman, M. M. (2012). Religiosity and major depression in adults at high risk: A ten-year prospective study. *American Journal of Psychiatry, 169,* 89–94.

Mofidi, M., Devellis, R. F., Blazer, D. G., Devellis, B. M., Panter, A. T., & Jordan, J. M. (2006). Spirituality and depressive symptoms in a racially diverse US sample of community-dwelling adults. *The Journal of Nervous and Mental Disease, 194,* 975–977. https://doi.org/10.1097/01.nmd.0000243825.14449.de

Murray, L., & Cooper, P. J. (1996). The impact of postpartum depression on child development. *International Review of Psychiatry, 8,* 55.

Muthén, L. K., & Muthén, B. O. (2015). *Mplus user's guide* (6th ed.). Los Angeles, CA: Muthén & Muthén.

O'hara, M. W., & McCabe, J. E. (2013). Postpartum depression: Current status and future directions. *Annual Review of Clinical Psychology, 9,* 379–407.

Onedera, J. D. (2008). *The role of religion in marriage and family counseling.* Boca Raton: CRC Press.

Paul, I. M., Downs, D. S., Schaefer, E. W., Beiler, J. S., & Weisman, C. S. (2013). Postpartum anxiety and maternal-infant health outcomes. *Pediatrics, 131,* e1218–e1224. https://doi.org/10.1542/peds.2012-2147

Pearlin, L. I., & Schooler, C. (1978). The structure of coping. *Journal of Health and Social Behavior, 19,* 2–21.

Pearlstein, T. (2015). Depression during pregnancy. *Best Practice & Research Clinical Obstetrics & Gynaecology, 29,* 754–764.

Peterson, J., Atwood, J. R., & Yates, B. (2002). Key elements for church-based health promotion programs: Outcome-based literature review. *Public Health Nursing, 19,* 401–411.

Pew Forum on Religion & Public Life. (2008). *U.S. religious landscape survey religious beliefsand practices: Diverse and politically relevant.*

Pew Forum on Religion & Public Life. (2015). *U.S. public becoming less religious.* Washington: Pew Research Center.

Ramey, S. L., Schafer, P., DeClerque, J. L., Lanzi, R. G., Hobel, C., Shalowitz, M., et al. (2015). The preconception stress and resiliency pathways model: A multi-level framework on maternal, paternal, and child health disparities derived by community-based participatory research. *Maternal and Child Health Journal, 19,* 707–719.

Rees, T. J. (2009). Is personal insecurity a cause of cross-national differences in the intensity of religious belief? *Journal of Religion and Society, 11,* 1–26.

Rosenberg, M. (1965). *Society and the adolescent self-image.* Princeton, NJ: Princeton University Press.

Scheier, M. F., & Carver, C. S. (1985). Optimism, coping, and health: Assessment and implications of generalized outcome expectancies. *Health Psychology, 4,* 219.

Simoni, J. M., & Ortiz, M. Z. (2003). Mediational models of spirituality and depressive symptomatology among HIV-positive Puerto Rican women. *Cultural Diversity & Ethnic Minority Psychology, 9,* 3–15. https://doi.org/10.1037/1099-9809.9.1.3

Smith, T. B., McCullough, M. E., & Poll, J. (2003). Religiousness and depression: Evidence for a main effect and the moderating influence of stressful life events. *Psychological Bulletin, 129,* 614–636. https://doi.org/10.1037/0033-2909.129.4.614

Spoozak, L., Gotman, N., Smith, M. V., Belanger, K., & Yonkers, K. A. (2009). Evaluation of a social support measure that may indicate risk of depression during pregnancy. *Journal of Affective Disorders, 114,* 216–223.

StataCorp. (2013). *Stata Statistical Software: Release 13.* College Station, TX: StataCorp LP.

StataCorp. (2015). *Stata Statistical Software: Release 14.* College Station, TX: StataCorp LP.

Sternthal, M. J., Williams, D. R., Musick, M. A., & Buck, A. C. (2010). Depression, anxiety, and religious life: A search for mediators. *Journal of Health and Social Behavior, 51,* 343–359. https://doi.org/10.1177/0022146510378237

Voorhees, C. C., Stillman, F. A., Swank, R. T., Heagerty, P. J., Levine, D. M., & Becker, D. M. (1996). Heart, body, and soul: Impact of church-based smoking cessation interventions on readiness to quit. *Preventive Medicine, 25,* 277–285.

Zittel-Palamara, K., Cercone, S. A., & Rockmaker, J. R. (2009). Spiritual support for women with postpartum depression. *Journal of Psychology and Christianity, 28,* 213–224.