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ORIGINAL PAPER

Performance of the Duke Religion Index and the Spiritual Well-Being Scale in Online Samples of Men Who Have Sex with Men

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Abstract Religiosity is associated with behaviors that reduce the risk of HIV/STI infection among general-population and heterosexual-specific samples. Whether this association is similar to homosexual persons is unknown. Measures of religiosity have not been evaluated psychometrically among men who have sex with men (MSM), a population who, because of stigma, experience religiosity differently than heterosexual persons. We assessed the duke religion index and the spiritual well-being in two samples of MSM. Neither instrument produced adequate model fit. To study the association between religiosity and HIV/STI risk behaviors among MSM, scales are needed that measure the religious and spiritual experiences of MSM.

Keywords Religion · Spirituality · HIV prevention · Gay men

Introduction

Religiosity is associated with sexual health. In general-population or heterosexual-specific samples, persons who are more religious have fewer sexual partners (Billy et al. 1993; Davidson et al. 2004; Lefkowitz et al. 2004; Seidman et al. 1992), which reduces risk for HIV and other sexually transmissible infections. Among adolescents, there is evidence of an increase in condom use and some evidence of later sexual debut associated with greater religiosity; this association appears strongest for women (Dodge et al. 2005; Fierros-Gonzalez and Brown 2002; Galvan et al. 2007; Kramer et al. 2007; Manlove et al. 2006; Nonnemaker et al. 2003; Studer and Arland 1987; Zaleski and Schiaffino 2000). Whether religiosity performs similarly among homosexual persons remains largely unknown.

Organized religions differ in their acceptance of homosexuality (Machacek and Wilcox 2003). Men who have sex with men (MSM) affiliated with a religion not accepting of homosexuality have a different religious experience than their heterosexual peers as they

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attempt to reconcile their religion's teachings about homosexuality with their same-sex attractions (Garcia et al. 2008; Roseborough 2006; Shallenberger 1996; Smith and Horne 2007). Homosexual persons who reject the tenants of the religious organizations in which they were raised because of a condemnation of homosexuality appear likely to also reject the health-promoting norms of the organization, increasing risk behavior (Rosario et al. 2006).

We cannot assume scales developed to measure religious constructs function similarly in heterosexual and homosexual samples because of the difference in how homosexuals experience religion. Most of the commonly used scales of religiosity and spirituality have not been validated in homosexual samples (Hill and Hood 1999). Valid measures of religiosity and spirituality are needed to determine whether the associations between religiosity and HIV/STI risk behaviors are similar between heterosexual and homosexual persons.

In 2010, we collected data from two online samples of MSM. In one survey, we included the duke religion index (DUREL; Koenig et al. 1997), and in another survey, we included a recently developed short version of the spiritual well-being scale (SWB; Bufford 2010) to assess their potential usefulness in samples of MSM. The DUREL has been validated in two samples of college students (Storch et al. 2004a, b) and used to assess religiosity in samples of healthcare providers (Cheever et al. 2005; Kim et al. 2004; McCauley et al. 2005), patients living with HIV (Cotton et al. 2006; Szaflarski et al. 2006), heart disease (Krucoff et al. 2001) or cancer (Sherman et al. 2001), women (Dedert et al. 2004), adolescents (Lee et al. 2006), collegiate athletes (Storch et al. 2003), and older adults (Klemmack et al. 2007). The full SWB (Ellison 1983) has been validated in samples of college students (Bassett et al. 2005; Genia 2001) and has been used to assess spiritual well-being in samples of healthcare providers (Saguil et al. 2011), patients living with HIV (Szaflarski, et al. 2006) or cardiovascular disease (Lawler and Younger 2002), persons accessing outpatient medical services (Daaleman 1999), substance users (Borman and Dixon 1998), adolescents (Davis et al. 2003; Tshabalala and Patel 2010), war veterans (Mihaljević et al. 2011), older adults (Eggers 2003; Gow et al. 2011), Jews (Musgrave and McFarlane 2004), Christians (Fee and Ingram 2004), and clergy (Francis and Stacks 2003).

One study of 93 gay and lesbian individuals living in the Midwestern US used the SWB to examine associations between the scales' constructs and measures of being well-adjusted (Tan 2005). The study found increased existential well-being was associated with increased self-esteem and acceptance of one's homosexuality and associated with decreased feelings of alienation. The same study found religious well-being to be a non-significant variable in regression models. Tan concluded that increased existential well-being was associated with being well-adjusted and that for gay and lesbian persons in his sample, the reconciliation of sexual attraction with religious beliefs was not necessary for being well-adjusted. Tan did not attempt to validate the scale in his sample before using it for his analysis. We found no studies validating the DUREL or the SWB in samples of MSM.

In this study, we used confirmatory factor analyses to examine the internal validity of each measure. Additionally, we estimated the association between the scale measures and hypothesized external correlates, including internalized homonegativity, depressive symptoms, affect, and substance use. Given that internalized homonegativity measures the extent to which a person internalizes negative social attitudes toward homosexuality (Meyer and Dean 1998) and the extant negative views against homosexuality espoused by several religions, we hypothesized that religiosity would be positively associated with internalized homonegativity. Since religiosity should increase internal conflict in homosexually oriented persons, we also hypothesized a positive association between religiosity and measures of depressive symptoms and negative affect. Presumably, men who remain affiliated with a faith tradition in spite of the potential negative consequences must have a

motivation for doing so. Thus, we also expected religious MSM to experience benefits. Assuming findings from the general population and heterosexual literature are transferable to MSM, we expected more religious MSM to have more positive affect (Koenig 1998) and less substance use (Chitwood et al. 2008; Van der Meer Sanchez et al. 2008).

Study One: Validation of the Duke Religion Index (DUREL)

Methods

Study Design

In 2008, we began a four-wave prospective, matched sample study of 16 US metropolitan statistical areas (MSAs) with different legislation on homosexuality. The purpose of the larger project was to assess the extent to which legislation about homosexuality influenced alcohol use and risky sexual behavior among MSM. Data for this analysis came from the third wave of data collection. Participants were recruited between April 22, 2010 and July 31, 2010 with geo-targeted banner advertisements and broadcast emails to active members from one of the nation's largest websites for gay men. Banner advertisements and emails directed interested persons to a webpage hosted on a dedicated university server with appropriate encryption to ensure data security. Eligibility criteria included being a man having prior sexual experience with a man, being 18 years or older, and reporting a residential zip code in a MSA under study. For this analysis, we were not interested in differences between MSAs with pro- or anti-gay legislation. We restricted the sample to the 2,060 men from across the 16 MSAs who reported identifying as Christian, atheist/agnostic, or spiritual. We excluded 378 participants affiliated with a variety of other faiths. Within each of the excluded faith traditions, we lacked enough persons to include them in the analysis. The mean survey completion time was 41 min. Participants were compensated $30 for their time. A certificate of confidentiality was obtained from the National Institutes of Health. The study was conducted under the oversight of the Institutional Review Board of the researchers' home institution. A refuse to answer response option allowed participants to opt out of answering any item.

Measures

The measures relevant to this paper are described below:

Religious or Spiritual Affiliation Participants were asked to indicate the primary religious or spiritual tradition with which they currently identify. The list of religious and spiritual traditions was a modification of a list developed by Roof and McKinney (1987).

Duke Religion Index (DUREL) Developed by Koenig et al. (1997), these five-item Likert-type scale measures three dimensions of religiosity. The organizational item asked about frequency of attendance at religious services (six response options: 1 = never, 6 = more than 1 time/week). The non-organizational item asked about frequency of private religious activities such as prayer or meditation (six response options: 1 = rarely or never, 6 = more than 1 time/day). The three subjective, or intrinsic, religiosity items asked about ever experiencing the presence of the divine, allowing religious beliefs to guide an approach to life, and transporting religion into other areas of life (five response options;

1 = definitely not true, 5 = definitely true). In our sample of MSM, the Cronbach's α for the intrinsic religiosity dimension was 0.89.

Revised Reactions to Homosexuality Scale Internalized homonegativity was assessed using Smolenski et al. (2010) revised reactions to homosexuality scale. Responses to the seven 7-point Likert-type questions ranged from strongly disagree to strongly agree and included three constructs: personal comfort with being gay (two items), public identification as gay (three items), and social comfort with gay men (two items). In our sample, the Cronbach's α for the entire scale was 0.84.

CES-D Short Form The CES-D short form (Cole et al. 2004) is a self-report assessment of depressive symptoms comprising four constructs: negative affect (two items), positive affect (two items), somatic symptoms (three items), and interpersonal symptoms (three items). Participants were asked to respond to ten 4-point Likert-type items ranging from rarely/none to most of the time. In our sample, the overall Cronbach's α was 0.85.

CAGE We screened participants for problematic drinking using the four item CAGE questionnaire (Ewing 1984). Participants who responded "yes" to at least two of four questions were classified as problematic drinkers. In our sample, the Kuder-Richardson 20 for the screener was 0.72, indicating adequate internal consistency.

Demographics Participants were asked to enter their current age, education, race, and ethnicity. To measure sexual orientation, participants could choose from gay/homosexual, bisexual, heterosexual, or could select "other" and type in their preferred identity. We assessed HIV status by asking participants if they had ever received an HIV diagnosis (yes/no).

Analysis

The purpose of this analysis was to validate the DUREL in a sample of MSM with diverse religious and spiritual beliefs. We used Mplus, version 5.2 (Muthén and Muthén 1998–2009), to test the three items representing intrinsic religiosity for configural measurement invariance (equivalence of factor model specifications) and metric measurement invariance (equivalence of factor loadings; Meredith 1993; Meredith and Teresi 2006; Wu et al. 2007) between participants identifying as Christians, atheists/agnostics, and spiritual. The three-item model could not be assessed for absolute fit to the data since the model had an equal number of parameters and observations (i.e., just identified). We used STATA-IC version 11.1 (StataCorp LP 2009) to calculate correlations between the DUREL constructs, internalized homonegativity, and depression. We used t-tests to compare the means of the DUREL constructs between individuals with problematic and non-problematic drinking as assessed by the CAGE questionnaire.

Results

Our sample was diverse. While 83.6 % of the participants were raised Christian, only 43.2 % currently identify with this faith tradition; 28.9 % identify as atheist or agnostic and 28.0 % identify as spiritual (but not Christian). When grouped by religious affiliation, participants differed by age, race, sexual orientation, and HIV status (Table 1). Participants

who identified as atheist or agnostic were younger than participants who identified as Christian or spiritual. The Christian group had a greater proportion of African Americans and fewer persons identifying as gay as compared to the other two groups. Finally, the prevalence of HIV was lowest among the atheist/agnostic group.

We were unable to validate the three-item measure of intrinsic religiosity across religious affiliation groups. Constraining the three-item model to have the same factor loadings across Christian, spiritual, and atheist/agnostic participants produced a statistically significant worsening of model fit ($\Delta X^2 = 17.04$, $df = 4$, $p = 0.002$). While the significant ΔX^2 could have been an artifact of the large sample size, the higher AIC, SABIC, and RMSEA values suggested that the DUREL performed differently between groups.

After failing to validate the three-item measure of intrinsic religiosity across religious affiliation groups, we attempted to validate the DUREL among a sub-sample of only Christian MSM. This seemed plausible since the DUREL was developed using

Table 1 Study one participant characteristics ($N = 2{,}060$)

	Christian $n = 889$ n (%)	Atheist/agnostic $n = 595$ n (%)	Spiritual $n = 576$ n (%)	F	df	p
Age (mean [SD])	38.4 (12.1)	32.6 (10.4)	37.6 (11.3)	49.4	2.0	**<0.001**
Education				na	na	0.411
Less than high school	6 (0.7)	2 (0.3)	3 (0.5)			
High school or GED	82 (9.2)	41 (6.9)	49 (8.5)			
Technical school	34 (3.8)	15 (2.5)	20 (3.5)			
Some college	270 (30.4)	181 (30.4)	200 (34.7)			
College degree	313 (35.3)	231 (38.8)	195 (33.9)			
Graduate degree	183 (20.6)	125 (21.0)	109 (18.9)			
Race				na	na	**<0.001**
American Indian/Alaskan Native	23 (2.6)	14 (2.4)	30 (5.2)			
Asian	18 (2.0)	29 (4.9)	13 (2.3)			
African American	72 (8.1)	13 (2.2)	24 (4.2)			
White	720 (81.0)	504 (84.7)	471 (81.8)			
Other	56 (6.3)	35 (5.9)	38 (6.6)			
Hispanic						
Yes	91 (10.2)	42 (7.1)	49 (8.5)	na	na	0.102
No	798 (89.8)	553 (92.9)	527 (91.5)			
Sexual orientation				na	na	**<0.001**
Gay/homosexual	733 (82.5)	528 (88.7)	533 (92.5)			
Other	156 (17.6)	67 (11.3)	43 (7.47)			
Living with HIV				na	na	**<0.001**
Yes	158 (17.8)	66 (11.1)	129 (22.4)			
No	731 (82.2)	529 (88.9)	447 (77.6)			

$\alpha = 0.05$. For age, statistical significance determined using ANOVA. Scheffe multiple comparison test indicates atheists/agnostic participants differ in age from Christian and spiritual participants ($p < 0.001$). For education, race, Hispanic ethnicity, sexual orientation, and HIV status, statistical significance determined using Pearson's χ^2

Bold values indicate statistically significant ($p < 0.05$)

Table 2 Correlation between DUREL constructs, internalized homonegativity, and depression among Christian participants ($N = 889$)

	1	2	3	4	5	Median (IQR)	Mean (Sd)
1. Attendance	1.00					3 (2.4)	–
2. Activity	**0.42**	1.00				1 (1.4)	–
3. Intrinsic	**0.34**	**0.50**	1.00			–	3.5 (1.1)
4. Internalized homonegativity	**0.08**	0.04	0.03	1.00		–	2.5 (1.3)
5. Depression	−0.02	0.06	0.04	0.07	1.00	–	4.1 (2.8)

Attendance and activity correlations calculated using Spearman. The correlations between intrinsic and internalized homonegativity and depression are calculated using Pearson pairwise. Internalized homonegativity assessed using the revised reactions to homosexuality scale. Depression assessed using the CES-D short form

Bold values indicate statistically significant ($p < 0.05$)

heterosexual or non-sexual orientation-specific samples, which in the US tend to be mostly Christian (Pew Research Center's Forum on Religion & Public Life 2008). As evidenced in Table 2, in a subsample of 889 Christian participants, the associations between the constructs and the external validation measures were modest and largely non-significant, with the exception of a small, positive correlation between religious service attendance and internalized homonegativity ($r = 0.08$). In addition, the means of the constructs did not differ between problematic and non-problematic drinkers (data not shown). Overall, these data suggest very limited construct validity of the DUREL among Christian-identified MSM.

Study Two: Validation of the Spiritual Well-Being Scale (SWB)

Methods

Study Design

Data for study two analyses were obtained from participants who completed the first of two surveys in a reliability study of questions for the sexually explicit media study. The study examines how watching sexually explicit media might influence HIV risk behavior among MSM. Participants were recruited online between January 4, 2011 and February 10, 2011 using banner advertisements on 148 gay-oriented websites affiliated with an advertising agency specializing in gay consumers. Banner advertisements directed interested persons to a webpage hosted on a dedicated university server with appropriate encryption to ensure data security. A total of 326 MSM met the eligibility criteria, which included having prior sexual experience with a man, being 18 years of age or older, and reporting a residential zip code within the US. We excluded eight participants affiliated with other faiths because we lacked enough persons to include them in the analysis. The mean completion time for the survey was 53 min. Participants were compensated $60 for completing all tasks related to the study. As before, a certificate of confidentiality was obtained from the National Institutes of Health, and the study was conducted under the oversight of the Institutional Review Board of the researchers' home institution. A refuse to answer response option allowed participants to opt out of answering any item.

Measures

The measures relevant to this paper are described below:

Religious or Spiritual Affiliation Participants indicated their primary religious or spiritual tradition using the same modified list we used in study one (Roof and McKinney 1987).

Short Version of the Spiritual Well-Being Scale (SWB) The original SWB is a 20-item scale developed to be a subjective assessment of quality of life. It includes two constructs: EWB, which is a measure of a person's life satisfaction, and religious well-being (RWB), which is a measure of a person's relationship with God (Ellison 1983; Smith and Ellison 1991). Recently, Bufford (2010) proposed a six-item version of the SWB consisting of three EWB items (feeling settled about the future, feeling satisfied with life, and enjoying much about life) and three RWB items (believing God is concerned about my problems, having a personally satisfying relationship with, God and feeling fulfilled when in close communion with God). Parallel to the 20-item version, participants respond to each item using a six-point Likert-type format (1 = strongly agree, 6 = strongly disagree).

Revised Reactions to Homosexuality Scale This is the same internalized homonegativity scale used in study one ($\alpha = 0.83$).

International-English Positive and Negative Affect Schedule Short Form (I-PANAS-SF) The I-PANAS-SF (Thompson 2007) is a self-report of personality traits. Five items assessed positive affect and five items assessed negative affect. Participants responded to five-point Likert-type items with anchors of "very little or not at all" to "extremely." The Cronbach's α were $\alpha_{\text{positive affect}} = 0.82$ and $\alpha_{\text{negative affect}} = 0.86$.

Binge Drinking Participants were asked how many times in the past 30-days they had consumed five or more drinks in one sitting. Persons who reported one or more episodes were classified as having engaged in recent binge drinking.

Analysis

Similar to the purpose of study one, in this study, we attempted to validate the short version of the SWB in a sample of MSM with diverse religious and spiritual beliefs. However, we lacked variation in the responses of the atheist/agnostic participants' and had too few spiritual participants to test for equivalency between groups. Thus, except for a between-group comparison of demographic characteristics, we restricted this analysis to 106 Christian participants. Using Mplus version 5.2, we conducted a confirmatory factor analysis of the SWB structures recommended by Bufford (2010). We used STATA-IC version 11.1 (StataCorp LP 2009) to calculate correlations between the SWB constructs, internalized homonegativity, positive affect, and negative affect. We used t-tests to compare the means of the SWB constructs between participants who did or did not report recent binge drinking.

Results

Similar to study one, the majority of participants in the study two samples were raised to identify as Christian (89.8 %). However, only 38 % of the sample currently identifies as

Christian; 50.5 % identify as atheist or agnostic and 11.5 % identify as spiritual. Religious affiliation groups were similar with the exception of spiritual participants being older than participants in the other groups (Table 3).

Since we were interested in a brief assessment tool, we chose to assess the short version in a sample of MSM. We could not confirm the structure of the six-item scale due to a redundancy between the communion and concern religious items. Thus, we removed the communion item, resulting in a five-item scale. We calculated a Cronbach's α for each subscale ($\alpha_{EWB} = 0.75$ and $\alpha_{RWB} = 0.57$). While the reliability statistic was lower than preferred for the RWB items, we deemed it acceptable considering only two items were loading on the factor.

Overall, the short version of the SWB did not perform well. Correlation coefficients between the 5-item SWB and validation constructs among Christian participants are reported in Table 4. Increased EWB was positively correlated with increased positive affect ($r = 0.35$) and negatively correlated with increased internalized homonegativity ($r = -0.36$) and negative affect ($r = -0.30$). An increase in the RWB was correlated with an increase in positive affect ($r = 0.26$). The means of the existential and religious subscales and the total SWB did not differ between participants who did or did not report recent binge drinking (data not shown). While the EWB items correlated well with the validation constructs, the expected correlations with the RWB items did not materialize.

Table 3 Study two participant characteristics ($N = 279$)

	Christian $n = 106$ n (%)	Atheist–agnostic $n = 141$ n (%)	Spiritual $n = 32$ n (%)	F	df	p
Age (mean [SD])	32.7 (11.2)	31.1 (11.5)	38.2 (11.7)	5.0	2.0	**0.007**
Education (mean [SD])	15.5 (3.0)	15.8 (2.9)	16.2 (2.4)	0.7	2.0	0.502
Race				na	na	0.279
American Indian/Alaskan Native	4 (3.8)	1 (0.7)	1 (3.1)			
Asian	2 (1.9)	9 (6.4)	2 (6.3)			
African American	6 (5.78)	6 (4.3)	–			
White	87 (82.1)	120 (85.1)	28 (87.5)			
Other	7 (6.6)	5 (3.6)	1 (3.1)			
Hispanic				na	na	0.295
Yes	12 (11.3)	8 (5.7)	2 (6.3)			
No	94 (88.7)	133 (94.3)	30 (93.8)			
Sexual orientation				na	na	0.820
Gay/homosexual	84 (79.3)	126 (89.4)	27 (84.4)			
Other	22 (2.8)	15 (10.6)	5 (15.6)			
Living with HIV				na	na	1.000
Yes	7 (6.6)	9 (6.4)	2 (6.3)			
No	99 (93.4)	132 (93.6)	30 (93.8)			

$\alpha = 0.05$. For age and education, statistical significance determined using ANOVA. Scheffe multiple comparison test indicates difference in age is between atheist/agnostic and spiritual participants ($p = 0.007$). For race, Hispanic ethnicity, sexual orientation, and HIV status, statistical significance determined using Fisher's exact

Bold value indicates statistically significant ($p < 0.05$)

Table 4 Correlation between 5-item spiritual well-being scale constructs, internalized homonegativity, and affect among Christian participants ($N = 106$)

	1	2	3	4	5	Mean (SD)
1. EWB	1.00					4.1 (1.1)
2. RWB	**0.32**	1.00				4.1 (1.3)
3. Internalized homonegativity	**−0.36**	−0.07	1.00			2.6 (1.4)
4. Positive affect	**0.35**	**0.26**	−0.17	1.00		3.6 (0.8)
5. Negative affect	**−0.30**	0.02	**0.27**	−0.04	1.00	2.3 (0.8)

Correlations calculated using Pearson pairwise. Existential and RWB is constructs of the spiritual well-being scale. Internalized homonegativity assessed using the revised reactions to homosexuality scale. Affect assessed using the I-PANAS-SF

Bold values indicate statistically significant ($p < 0.05$)

Discussion

We could not fully validate either scale in samples that included MSM with diverse religious and spiritual beliefs. Among a sub-sample of Christians, the religious service attendance measure of the DUREL had a minimal correlation with internalized homonegativity. The SWB performed better than the DUREL in a sub-sample of Christians. Similar to Tan (2005), the EWB construct correlated well with most of the validation constructs whereas the RWB construct only correlated with positive affect. There are at least three possible explanations for the lack of correlation between the RWB construct and the validation constructs. First, as suggested by Tan, the EWB construct might be more relevant than the RWB construct when participants are MSM. Second, it is possible that participants in our sample did not experience a dissonance between their religious beliefs and same-gender attraction (we did not specifically ask this question). Third, it is possible participants experienced dissonance in their past but resolved it prior to participating in our study.

A plausible explanation for the inability to validate the scales among our diverse MSM samples is that homosexual persons experience religiosity and spirituality differently than heterosexual persons. While 83.6 % of the study one sample was raised Christian, only 43.2 % still identified with the faith tradition. Similarly, in study two, 89.8 % was raised Christian, but only 38.0 % currently identified with the religion? To escape the stigma experienced by being affiliated with a religious organization not accepting of same-gender attraction, many homosexual persons abandon the faith communities in which they were raised (Rosario et al. 2006). Those that stay affiliated with their faith community often form an understanding of their faith that blends church teachings with a belief in a god that approves of homosexuality, for example, concluding that the church's teachings on homosexuality are wrong but still finding value in remaining affiliated with the organization (Rosser 1992; Yip 1997, 1999, 2002).

Both studies had similar limitations. They used cross-sectional samples of mostly white, young, and gay-identified Internet-using men. In study one, demographic differences between Christian, atheist/agnostic, and spiritual participants could partially explain the DUREL's lack of measurement invariance between groups. In addition, dichotomous outcomes resulting from the structure of the CAGE in study one and our binge-drinking question in study two were not ideal for correlation studies. Despite these limitations, these analyses bring to the forefront the need for validated scales that assess the religious and spiritual experiences of MSM.

Because homosexual persons appear to experience religion and spirituality differently than their heterosexual peers, new and adapted measures of religiosity and spirituality are necessary to conduct research on religiosity and spirituality among MSM. Formative research is needed to identify those religious and spiritual factors relevant to MSM. With better religiosity and spirituality scales, sexual health programs that include a religious or spiritual component will be better equipped to assess the effectiveness of this component and to meet the needs of religious MSM participants.

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