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# Psychological Bulletin

## The Relationship Between Religiousness and Health Among Sexual Minorities: A Meta-Analysis

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# The Relationship Between Religiousness and Health Among Sexual Minorities: A Meta-Analysis

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Meta-analyses suggest that religiousness/spirituality (R/S) is consistently and positively associated with health (average  $r = .15$ ); however, the strength and direction of this relationship is much less clear among sexual minorities, and many sexual minorities experience tension related to R/S. To address this, we present results from the first meta-analysis of the relationship between R/S and health among sexual minorities. Using 279 effect sizes nested within 73 studies, multilevel meta-analyses suggest a small but positive overall relationship between R/S and health among sexual minorities ( $r = .05$ ), with a substantial amount of residual heterogeneity. Moderator analyses clarify that this relationship is particularly positive when R/S is conceptualized as spirituality ( $r = .14$ ) or as religious cognition (e.g., belief;  $r = .10$ ). The relationship between R/S and health disappears or becomes negative when participants are sampled from sexual minority venues (e.g., bars/clubs;  $r = .01$ ). Minority stress, structural stigma, and causal pathways theories provide some structure to understand results; however, none of these theories is able to explain results fully. We synthesize these theories to provide an initial theoretical explanation: the degree to which R/S promotes or harms sexual minorities' health depends on (a) where the individual is in their sexual identity development/integration; (b) what their current R/S beliefs, practices, and motivations are; and (c) how well their environmental circumstances support their sexual and/or religious identities.

### Public Significance Statement

This meta-analysis of 279 effect sizes from 73 studies suggests that religiousness/spirituality has a small but positive relationship with health among sexual minorities. Moderator analyses suggest that the strength of the relationship between religiousness/spirituality and health depends on the sexual minority individual's degree of sexual identity integration, that individual's specific R/S beliefs and practices, and the supportiveness of the individual's environment.


**Keywords:** sexual minority, religiousness, spirituality, health, LGBTQ


**Supplemental materials:** <https://doi.org/10.1037/bul0000321.supp>


Throughout recorded history, religion has been a force for good and a force for ill. On the one hand, religion has helped countless people cope with stress and loss, make and search for meaning, find hope and inspiration, navigate life with a guiding set of beliefs and morals, and draw on human and divine sources of support (Pargament, 2013). On the other hand, religion has caused incalculable pain, distress, and destruction, particularly to groups already oppressed within their historical and


sociocultural context (Hansen et al., 2018; Palmer & Burgess, 2012).

One group that has consistently suffered at the hand of religion is *sexual minorities*—"individuals who self-identify as lesbian, gay, or bisexual; experience significant levels of same-sex attractions; or engage in significant amounts of homosexual behavior" (Herek & McLemore, 2013, p. 310; Yip, 2018). Sexual minorities comprise a substantial percentage (3.5%–6%) of both the U.S.

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To enable replicability of our findings, we have uploaded our coding spreadsheet and data file to the Open Science Foundation. They can be

viewed through the following anonymized link: [https://osf.io/fmkqr/?view\\_only=c3c2eaf44d0343679998da57016ed328](https://osf.io/fmkqr/?view_only=c3c2eaf44d0343679998da57016ed328).

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(Pew Research Center, 2013; Williams Institute, 2019) and global population (Bailey et al., 2016; Koehler & Menzies, 2017). Worldwide, sexual minorities have suffered from religion and religious individuals in several tangible ways: (a) being victims of religion-based violence and trauma (e.g., torture, hate crimes, or death); (b) experiencing religion-based prejudice and discrimination (e.g., unequal access to the same opportunities, benefits, and protections as heterosexuals); and (c) undergoing harmful, religion-based interventions and therapies (e.g., sexual-orientation change efforts; American Psychological Association, 2009; Boswell, 2015; Clarke et al., 1989).

Due to this history of oppression, many sexual minorities have quite a complicated relationship with religion (Lefevor, Beckstead, et al., 2019; Rodriguez et al., 2019). Some look to religion as a source of support and solace, even if they paradoxically experience it as a source of stigma and stress (Rodriguez, 2010). Others come to abandon religion altogether, avoiding and possibly opposing reminders of what once caused them so much pain, distress, or even trauma (Fontenot, 2013).

The purpose of the present meta-analysis is to examine this complex relationship empirically by (a) seeing what relationship (if any) exists between religion/spirituality (R/S) and health among sexual minorities—particularly given the positive relationship observed within the general population (Koenig et al., 2012; Oman & Syme, 2018) and (b) identifying possible moderators of the relationship between R/S and health among sexual minorities. To date, there have been a few systematic reviews of this relationship (e.g., Rodriguez, 2010; Wilkinson & Johnson, 2020), but no meta-analytic review has been conducted.

## Religion/Spirituality and Health in the General Population

The terms *religion* and *spirituality* refer to overlapping but distinct constructs. *Spirituality* has been defined as “a search for or relationship with the sacred” (Harris et al., 2018, p. 1), where the *sacred* refers to “manifestations of the divine, existential meaningfulness, or an ultimate concern as perceived by an individual” (Harris et al., 2018, p. 1). By comparison, *religion* refers to “ritual, institutional, or codified spirituality that is culturally sanctioned” (Harris et al., 2018, p. 1). Although *religion* and *spirituality* are distinct constructs, we discuss them collectively as R/S, in order to illustrate the common ways they often relate to health (Koenig, 2012; Pargament, 2013).

Over 100 meta-analytic and systematic reviews have examined the relationship between R/S and health, including numerous quantitative meta-analyses (Oman & Syme, 2018). By *health*, we refer to various aspects of health including physical health, mental health, well-being, sexual health, suicidality, and substance use. Table 1 summarizes the results of the 20 quantitative meta-analyses that were published between 1983 and 2019 and provided at least one cumulative effect size (Pearson  $r$ ) of the relationship between R/S and health. The mean effect size of these meta-analyses is .15, the median is .16, and the range is from .03 (Hodapp & Zwingmann, 2019) to .34 (Sawatzky et al., 2005). In sum, it is well-established there is a small-to-medium positive relationship between R/S and health in the general population (Cohen, 1988; Koenig, 2012).

**Table 1**

*Summary of Results From Meta-Analyses of the Relationship Between Religion/Spirituality (R/S) and Health, 1983–2019*

Meta-analysis	$k$	Total $N$	Focus	Number of cumulative ESs	Overall ES ( $r$ ) <sup>a</sup>
Ano and Vasconcelles (2005)	49	13,512	R/S coping and psychological adjustment	4	.17 <sup>b</sup>
Baier and Wright (2001)	60	186,720	R/S and lower criminal behavior	1	.12
Bergin (2001)	24	9,799	R/S and lower psychopathology	1	.09
Cheung and Yeung (2011)	40	204,111	R/S and behavioral adjustment among adolescents	1	.19
Forouhari et al. (2019)	13	5,620	Religious orientation and lower anxiety	1	.08
Hackney and Sanders (2003)	34	NR	R/S and mental health	1	.10
Haney (2020)	16	24,767	R/S and lower nonsuicidal self-injury	1	.10
Hodapp and Zwingmann (2019)	67	119,575	R/S and mental health among German-speaking people	1	.03
Jim et al. (2015)	101	32,421	R/S and physical health among cancer patients	1	.15
Kelly et al. (2015)	62	193,656	R/S and lower delinquent behavior	6	.19 <sup>b</sup>
Mahoney et al. (2001)	78	198,126	R/S and family adjustment (marital, parental, or family)	12	.10 <sup>b</sup>
Reynolds et al. (2016)	14	1,222	R/S coping and both psychosocial adjustment and physical health among youth with chronic illness	5	.19 <sup>b</sup>
Salsman et al. (2015)	148	39,220	R/S and mental health among cancer patients	1	.19
Sawatzky et al. (2005)	51	22,554	R/S and quality of life	1	.34
Sherman et al. (2015)	78	14,277	R/S and social health among cancer patients	1	.20
Smith et al. (2003)	147	98,975	R/S and lower depressive symptoms	1	.10
Stulp et al. (2019)	112	29,963	God representations and psychosocial adjustment	14	.20 <sup>b</sup>
Witter et al. (1985)	28	NR	R/S and subjective well-being	1	.16
Yeung et al. (2009)	22	152,378	R/S and lower substance use among youth	1	.16
Yonker et al. (2012)	75	66,273	R/S and psychological adjustment	4	.14 <sup>b</sup>
Mean cumulative ES					.15
Median cumulative ES					.16

*Note.* NR = not reported; ES = effect size. Meta-analyses are presented in alphabetical order.

<sup>a</sup>To permit interpretation across meta-analyses, some signs were changed such that a positive  $r$  indicated better health outcomes. <sup>b</sup>Because multiple cumulative ESs were calculated in this meta-analysis, the median cumulative ES is reported here.

## Explaining the Link Between Religion/Spirituality and Health

Several mechanisms have been proposed to explain the link between R/S and health. After an extensive review of the literature, Koenig et al. (2012) proposed the *causal-pathways theory*, which suggests these mechanisms can be grouped into three main pathways by which R/S affects health: psychological pathways, social pathways, and behavioral pathways.

First, R/S may affect health through *psychological pathways*. These psychological pathways include: (a) the positive versus negative R/S strategies people use to cope with stress (Bockrath et al., in press; Pargament et al., 2013); (b) the adaptive versus maladaptive ways people use R/S to make meaning (Park, 2013; Park et al., 2017); (c) the positive versus negative emotions people experience as they practice R/S (Tsai et al., 2013; Van Cappellen et al., 2016); and (d) the adaptive versus maladaptive ways people's R/S beliefs influence how they view and relate with others, themselves, and the world (Koenig, 2012; Rouse, 2012; Rowatt et al., 2013).

Second, R/S can affect people's health via *social pathways*. For instance, R/S communities and traditions can serve as a meaningful source of social support (Debnam et al., 2012; Hayward & Krause, 2013), prosocial modeling (Oman, 2013), and a sense of belonging (Krause & Wulff, 2005). They also can offer formative contexts for character education (McMinn, 2017; Worthington & Berry, 2005), virtue development (Furrow et al., 2004; Schnitker & Emmons, 2017), and community engagement (Driskell et al., 2008; Uslander, 2002). On the other hand, R/S may hinder health through negative and harmful interactions with R/S individuals and groups (Chatters et al., 2018; Ellison et al., 2009), well-intentioned but ill-informed advice that is harmful to health (Oh et al., 2019; Stanford, 2007), and modeling or reinforcement of prejudicial attitudes and behaviors (Etengoff & Lefevor, 2020; Ng & Gervais, 2017; Rowatt et al., 2009, 2013).

Third, R/S can affect people's health via *behavioral pathways*. For example, most R/S traditions prescribe the types of prosocial behaviors (e.g., gratitude, compassion, forgiveness, altruism, and self-control) that are robustly associated with positive relational, mental, and physical health outcomes (Koenig, 2012; Schnitker & Emmons, 2017). Most R/S traditions proscribe the types of negative behaviors (e.g., substance misuse, risky sexual practices, and criminal or antisocial behaviors) that are associated with negative health consequences (Koenig et al., 2012; Rosmarin & Koenig, 2020). Moreover, several private and public R/S practices (e.g., prayer, meditation, and R/S service attendance) have positive health benefits (Pargament, 2013; Spilka & Ladd, 2013), and faithful practicing of many R/S traditions involves engaging in healthy behaviors like good exercise and healthy eating (Koenig, 2012). Alternatively, R/S may hinder health. People can misuse their R/S to justify hateful, aggressive, discriminatory, or manipulative behavior, which has negative health consequences both for victims and perpetrators (Hoffarth et al., 2018). Likewise, R/S can be misused to justify self-injurious behaviors, obsessive practices, delusional behaviors, or escapist practices. R/S also can be misused to rationalize health-harming behaviors of omission (e.g., avoiding getting needed health care) or commission (e.g., participating in harmful interventions such as sexual-orientation change efforts; Koenig, 2012).

Koenig's (2012) causal pathways theory focuses on how R/S influences people's health, but other scholars have proposed

theories of how people's health influences their R/S. For example, Hathaway (2003) has discussed how psychopathology can significantly impair individuals' abilities to engage in religious/spiritual activities or experience positive emotions typically associated with their R/S. Park and Slattery (2013) have argued that health can either facilitate R/S (e.g., stress can impel people to turn to R/S for relief or comfort) or hinder R/S (e.g., people can develop R/S struggles because of their health problems). Similarly, Pargament and Lomax (2013) have posited that R/S struggles can be a byproduct of mental disorders (*secondary-struggles theory*), a source of mental disorders (*primary-struggles theory*), or a bidirectional exacerbator of each other (*complex-struggles theory*).

## Religion/Spirituality and Health Among Sexual Minorities

In the U.S., sexual minorities appear to be substantially less religious than the general population, with 59% reporting a religious affiliation (compared with 77% of the general population) and 42% identifying as Christian (compared with 73%; Pew Research Center, 2015). The vast majority of U.S. sexual minorities report perceiving most religious groups as unfriendly toward sexual minorities, particularly the Muslim religion (84%), Mormon Church (83%), Catholic Church (79%), and Evangelical Protestant Church (73%; Pew Research Center, 2013). In fact, 29% of U.S. sexual minorities report they "personally have been made to feel unwelcome in a church or religious organization" (Pew Research Center, 2013, p. 100).

These findings likely reflect the degree to which religion has been a vehicle of sexual stigma and oppression across history and cultures (Etengoff & Lefevor, 2020; Hoffarth et al., 2018; Worthen et al., 2017). Throughout history, religious texts and traditions have been key structural mechanisms by which cultures have cross-generationally transmitted *sexual stigma* (that is, "a culture's shared knowledge about the negative regard, inferior status, and relative powerlessness that society collectively accords to nonheterosexual behaviors, identity, relationships, and communities"; Herek & McLemore, 2013, p. 311) and *sexual prejudice* (i.e., "a negative attitude toward an individual based on her or his membership in a group defined by its members' sexual attractions, behaviors, or orientation"; Herek & McLemore, 2013, p. 311). Many religious texts and traditions condemn same-sex sexual behavior—engendering sexual stigma and prejudice, even if texts are not literally interpreted or policies are not rigidly enforced (Lefevor, Sorrell, et al., 2019). Moreover, across history and cultures, sexual minorities have frequently encountered *enacted stigma* (i.e., "behavioral expressions of sexual stigma, including antigay statements, ostracism, discrimination, and violence"; Herek & McLemore, 2013, p. 312), either in the context of religious institutions or at the hand of religious individuals (Ciocca et al., 2017; Lefevor, Huffman, et al., 2020; Worthen et al., 2017). Furthermore, across time and cultures, religion has often been used to justify negative attitudes and laws related to same-sex sexual behavior (Hoffarth et al., 2018).

Indeed, meta-analytic evidence indicates that virtually every index of religiousness—including religious fundamentalism, service attendance, orthodoxy, importance, and intrinsic motivation—demonstrates a moderate to strong positive association with sexual prejudice (Whitley, 2009; Hedge's  $d_s = -.48$  to  $-1.00$ ). Consequently, the more a sexual minority is exposed to religion—such as in the context of a religious family, community, or culture—the

more likely they may be to encounter heightened levels of *minority stress* (i.e., excess stress due to their stigmatized social status as a sexual minority; Meyer, 2003), relative to sexual minorities with less exposure to religion (Barnes & Meyer, 2012). They also may be more likely to internalize (accept) sexual stigma as part of their own belief system during childhood, which as they become aware of their sexual attractions and orientation may begin to manifest as *self-stigma* (i.e., self-directed negative feelings and thoughts because of their stigmatized status; Herek & McLemore, 2013).

Meyer's (2003) *minority-stress theory* and Hatzenbuehler's (2009) *internalized-stigma theory* suggest this heightened exposure to sexual stigma and minority stress may lead religiously exposed sexual minorities to experience elevated emotional dysregulation (e.g., recurrent feelings of shame, guilt, fear, and self-loathing), social problems (e.g., enacted and felt stigma), and harmful cognitions (e.g., beliefs they are unlovable, inadequate, broken, or inferior). In turn, this may increase their risk for psychopathology (e.g., depressive, anxiety, and substance use disorders), suicide, and nonsuicidal self-injury. These theories have garnered substantial support as an explanation for the alarming and disproportionately high rates of depression (Lefevor et al., 2018), suicide (Marshall et al., 2013), and anxiety (Lick et al., 2013) experienced by sexual minorities, relative to heterosexual individuals. Paradoxically, sexual minorities—especially those who are raised religious—may draw on their R/S to help mitigate the distress they experience in religious spaces. The degree to which R/S exacerbates or mitigates this risk likely depends on (a) where the sexual minority is in their sexual identity development and integration process; (b) what their current R/S beliefs, practices, and motivations are; and (c) how well their environmental circumstances (e.g., religious community and social network) support where they are in their sexual identity development and integration process (Burch-Brown & Baker, 2016; Meyer, 2003; Rodriguez, 2010; Shallenberger, 1996).

One key factor in this complex relationship between sexual minorities' R/S and their health might be the degree to which a sexual minority currently perceives there is a conflict between their sexual orientation and their R/S (Rodriguez, 2010). According to Baumeister et al.'s (1985) *identity-conflict theory*, people have a multiplicity of identities, and identity conflict arises when there is a perceived incompatibility between two or more distinct identities to which one has a strong, emotionally meaningful commitment (Rodriguez, 2010). Not all R/S sexual minorities experience conflict between their sexual and R/S identities (Mahaffy, 1996; Rodriguez & Ouellette, 2000); indeed, one nationally representative survey indicates only 26% of U.S. sexual minorities report currently experiencing such conflict (Pew Research Center, 2013). This type of internal conflict appears most likely to occur during adolescence or emerging adulthood (Kubicek et al., 2009), presumably as R/S sexual minorities become increasingly aware of their sexual orientation and as issues of identity are heightened (Arnett, 2000; Erikson, 1968; Marcia, 1966; Ream & Rodriguez, 2014). One reason many sexual minorities may not experience this internal conflict is that they are engaged with religious communities and support organizations that are sexual-minority friendly (Rodriguez & Ouellette, 2000).

Rodriguez and Ouellette (2000) proposed four pathways by which sexual minorities usually try resolving perceived conflict between their sexual and R/S identities: (a) rejecting a R/S identity

(e.g., religiously disaffiliating), (b) rejecting a sexual-minority identity (e.g., seeking to practice same-sex sexual celibacy or even ill-advisedly to try changing their sexual orientation), (c) compartmentalizing their sexual and R/S identities from each other, or (d) integrating their sexual and R/S identities. Growing evidence indicates that resolution of identity conflict is associated with improvements in sexual minorities' health and well-being (Foster et al., 2015; Lefevor, Blaber, et al. 2019; Lefevor, Sorrell, et al. 2020). Preliminary findings also suggest that high levels of health and well-being are evident in sexual minorities who pursue a wide range of options for integrating their sexual and R/S identities (Lefevor, Beckstead, et al., 2019).

## The Current Study

The empirical research on the relationship between R/S and health among sexual minorities is quite fragmented (Rodriguez, 2010). What is needed is a meta-analytic review that synthesizes the results of all existing studies and explores possible moderators that might influence the strength or direction of the relationship between R/S and health. For instance, because many sexual minorities report resolving identity conflict by developing a personalized spirituality and distancing themselves from institutionalized religion (Kubicek et al., 2009; Shallenberger, 1996)—even as other sexual minorities find religious community in sexual minority friendly places of worship (Mahaffy, 1996; Rodriguez & Ouellette, 2000)—there may be a more positive relationship between R/S and health when R/S is operationalized as personalized spirituality (vs. as institutionalized religion). Further, because identity conflict may be more likely to happen earlier in life, there might be a more negative relationship between R/S and health for younger sexual minorities. In addition, because many sexual minorities report negative experiences in places of worship (Lefevor, Sorrell, et al., 2019), there may be a more negative relationship between R/S and health when R/S is operationalized as service attendance.

Given that the intersection (or tension) between R/S and sexuality has been highly politicized (both currently and historically), we were especially interested in exploring the degree to which researcher and participant biases may moderate the relationships observed in studies. In particular, we were interested in examining whether study characteristics (e.g., journal outlet, sampling venue, sampling method), participant characteristics (e.g., age, gender, race/ethnicity), and measurement characteristics (e.g., how sexual orientation, R/S, and health were assessed) might moderate the relationship between R/S and health.

## Method

### Search Strategy

To understand the terms used in describing R/S and health among sexual minorities, we looked at previous meta-analyses that examined the effects of R/S and sexual orientation on health. We developed our keywords by examining the keywords used in these meta-analyses and from the recommendations of Lee et al. (2016). The final keywords included aspects of R/S, aspects of sexual orientation, and aspects of health conjoined by the Boolean operator "and" (see Appendix A in online supplemental materials for keywords and the reference list for the meta-analyses searched).

Using these keywords, we conducted an initial literature search in April 2019, searching the following databases: PsycINFO, Academic Search Premier, Open Dissertations, PsycARTICLES, Psychology and Behavioral Sciences Collection (EBSCO), PubMed, and ERIC. The search yielded a total of 10,283 documents. Of these, 8,627 were found in EBSCO (PsycINFO, Academic Search Premier, Open Dissertations, PsycARTICLES, and Psychology and Behavioral Sciences Collection), 1,413 were found in PubMed, and 233 were found in ERIC. The first author screened the titles of all documents, looking for documents that referenced sexual orientation, R/S, and health outcomes in their title (or keywords) and that appeared to be a quantitative, empirical study. This process yielded 433 documents.

In May through July 2019, the research team employed several additional search procedures, in order to locate other relevant documents (the number of documents meeting these initial screening criteria are listed in parentheses). We searched the reference lists of the 31 published meta-analyses and three systematic reviews that examined the effects of sexual orientation and/or R/S on health outcomes ( $k = 57$ ; these searched meta-analyses and reviews are marked in the reference list). We also conducted a backward search of all included documents, examining the reference lists for articles that had potentially been missed ( $k = 23$ ). Finally, we posted advertisements in relevant listservs and personally contacted authors with studies that were included in the meta-analysis, asking if they had additional data, whether published or unpublished ( $k = 30$ ). Taken together, this process yielded an additional 110 documents, for a total of 543 documents. After removing duplicates ( $k = 200$ ) and identifying two documents that each had two studies, we had 343 documents and 345 studies that were selected to be examined for inclusion criteria.

### Selection Criteria

To be included in the present analysis, studies needed to be a quantitative, empirical investigation that examined a health-related dependent variable and assessed the relationship between R/S and health in a sample or subsample of sexual minority individuals. We defined R/S to include religious affiliation, organizational religious behavior, nonorganizational religious behavior, intrinsic religiousness, and religious belief/cognition (and to exclude religious coping and religious well-being, due to confounding relationships between these variables and health). We defined health to include mental health, well-being, physical health, sexual health, substance use, and self-harm/suicidality. We defined sexual minority to include individuals who reported some degree of same-sex sexual attraction, behavior, or identity (Lefevor, Park, et al., 2020). Studies needed to present original data and either to report an effect size of the relationship between R/S and health in a sexual minority sample or contain enough information to calculate an effect size (i.e., provide means and standard deviations of health for sexual minority samples at various degrees of R/S). No further limitations were placed on studies in terms of participant characteristics, research design, time period, or geography. These criteria follow the guidelines outlined by The Campbell Collaboration (2019).

All documents were evaluated by the first author and two undergraduate research assistants with the team yielding an 86% agreement on inclusion/exclusion of articles. Disagreements were handled through team discussion and consensus. From this process, 272 documents were excluded because (a) they were not a quantitative, empirical study ( $k = 142$ ); (b) they did not examine

R/S as an independent variable ( $k = 36$ ); (c) they did not examine a health-related dependent variable ( $k = 37$ ); and (d) they did not examine the relationship between R/S and health in a sexual minority sample ( $k = 57$ ). If a study assessed sexual orientation, R/S, and health but did not report an effect size for the relationship between R/S and health in a sexual minority sample (group “d” above), the research team reached out to the study author to request that they provide any missing information. If information was provided, the study was then included. This left a total of 71 documents in the final sample, collectively comprising 73 studies, 279 effect sizes, and 40,057 participants (see Table B1 in Appendix B for a table of included studies and relevant coding characteristics). The study selection flowchart is displayed in Figure 1.

### Power

Given that previous meta-analyses on the relationship between R/S and health have detected small effect sizes ( $r = .15$ ), we conducted a power analysis to ensure that we could detect an effect if one existed. We determined that the smallest meaningful effect size would be  $r = .05$ . Because there has yet to emerge a single “best practice” way of assessing power in multilevel meta-analyses, we followed recommendations by Valentine et al. (2010) for single-level meta-analyses, substituting the number of studies for the number of effect sizes. This procedure is likely to produce a conservative estimate of power, because multilevel modeling preserves power more effectively by accounting for dependency. Using an alpha of .05 and a final sample of 73 studies (with an average of 549 participants per study), assuming a moderate degree of heterogeneity ( $I^2 = .5$ ), we found our power to approach  $\beta = 1.00$ , indicating that our analysis is sufficiently powered to detect very small overall effects.

### Study Coding

To ensure accuracy, all studies were coded by the author and by two of four undergraduate research assistants. Coders had an average of 92% agreement. All variables had above an 80% agreement except for one: the percentage of participants in a study who were religious (64%). Low reliability in this variable was largely due to computational errors, based on raw numbers reported in studies. Disagreements were resolved by team discussion and consensus. Study quality was assessed through sampling technique (random vs. convenience) and sampling representativeness (representative vs. not representative). Studies were coded for the following variables:

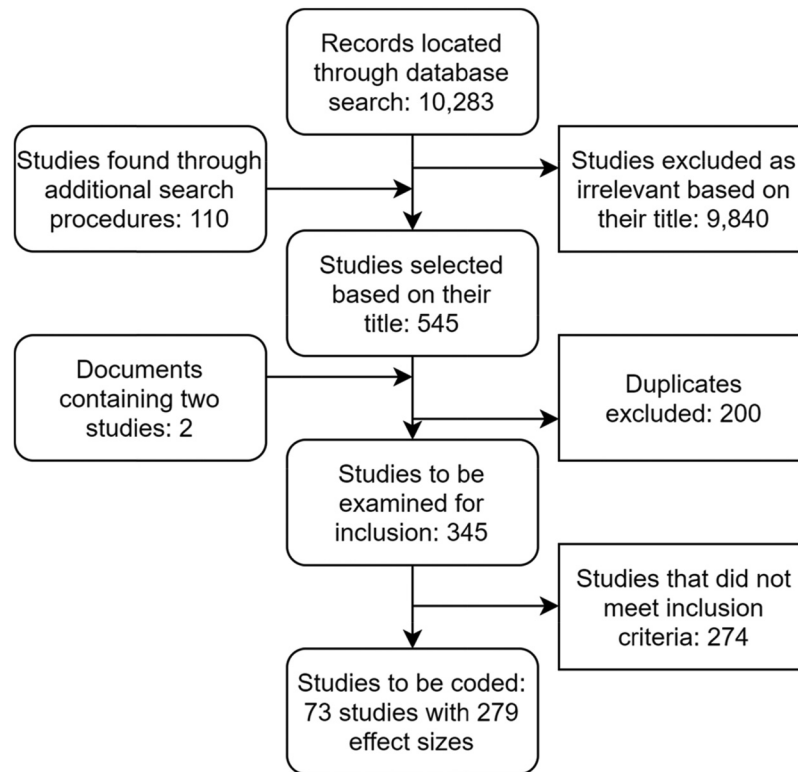
#### Sample Characteristics

Sample characteristics assessed were (a) mean age of participants, (b) gender of participants (percentage women, percentage men, and percentage transgender/genderqueer), (c) race/ethnicity (percentage of participants who identify as White), (d) education (percentage having completed a bachelor's degree), and (e) religious affiliation (percentage reporting a religious affiliation).

#### Sampling Characteristics

Sampling characteristics assessed were (a) randomization of sampling (random vs. convenience), (b) representativeness of sample (representative vs. not representative; representative samples were operationalized to be a random sample of individuals intended to represent a country's population), (c) inclusion of

**Figure 1**  
*Study Selection Flowchart*



sexual minority venues in sampling method (yes vs. no), and (d) inclusion of religious venues in sampling method (yes vs. no).

### **Study Characteristics**

Study characteristics assessed were (a) publication type (journal article vs. thesis/dissertation), (b) publication year, (c) published in a religion-focused journal (yes vs. no), (d) published in a sexuality- or sexual orientation-focused journal (yes vs. no), and (e) geographic location of study (study conducted in the United States vs. outside the United States).

### **Measurement Characteristics**

Measurement characteristics assessed were (a) assessment of religiousness (affiliation, nonorganizational religious behavior, organizational religious behavior, intrinsic religiousness, religious/spiritual belief or cognition, or more than one), (b) assessment of spirituality (is the study exclusively focused on assessing spirituality? yes vs. no), (c) assessment of sexual orientation (sexual attraction, sexual behavior, sexual identity, or more than one), and (d) assessment of health (mental distress, well-being, substance use, sexual health, or physical health).

### **Effect Size**

Because we were interested in the strength of the relationship between R/S and health, we used correlation coefficients as our

primary measure of effect size ( $n = 128$ ). Some studies in our sample included other measures of effect size, such as standardized betas ( $n = 31$ ), Cohen's  $d$ s ( $n = 12$ ), partial eta-squared values ( $n = 12$ ), odds ratios ( $n = 90$ ), and  $t$ -statistics ( $n = 6$ ). We transformed all measures of effect size to a correlation coefficient, following transformations suggested in Cohen (1988). Where studies reported an outcome other than a correlation coefficient or standardized beta, we first verified whether this outcome was based on a continuous underlying construct. Because all were (given that no studies in the present analysis involved experimental manipulations), the variance of these effect sizes were calculated following the biserial correlation coefficient guidelines of Jacobs and Viechtbauer (2017). Additionally, where studies reported a standardized beta regression weight but did not report a correlation coefficient, standardized betas were transformed as suggested by Peterson and Brown (2005). As data were transformed, care was taken to reverse code where necessary, in order to ensure that positive values represented a positive relationship between R/S and health. Because Fisher's  $z$  introduces a positive bias into results of meta-analyses of correlation coefficients, we conducted the analyses using the raw correlation coefficient and its variance  $(1 - \bar{r}^2)^2/(N - 1)$  (Schmidt & Hunter, 2015). We follow Cohen's (1988) conventions in interpreting the sizes of our effects as small ( $r = .1$ ), medium ( $r = .3$ ), or large ( $r = .5$ ).

Even with the adjustments proposed by Peterson and Brown (2005), beta coefficients may not accurately portray the true



correlation between two variables, due to the presence of other variables in the regression (Roth et al., 2018). As such, we first reached out to all authors who reported a beta value (but not correlation values) in their article, requesting information about raw correlations. Where correlation values were provided, these were used in place of the beta values. Nonetheless, 11 studies and 31 effect sizes only reported beta regression weights. Consequently, we performed sensitivity analyses to examine whether the inclusion of studies reporting beta coefficients biased our analyses. We found that the overall effect size was unsubstantially smaller when betas were excluded ( $\Delta\bar{r} = .0062$ ). Because the difference was unsubstantial, in subsequent analyses, we included studies that only reported betas as a measure of effect size.

### Statistical Analyses

Multilevel models (MLM) can be used to answer meta-analytic questions, particularly when studies contain several effect sizes of interest. When studies contain several effect sizes, meta-analytic MLMs have several advantages over traditional meta-analytic approaches (Assink & Wibbelink, 2016; Bettencourt et al., 2016). First, MLMs preserve power by utilizing information from each of the effects within a given study. In traditional meta-analytic procedures, only one effect size per study ought to be included, in order to avoid dependency issues (Lipsey & Wilson, 2001). Second, MLMs allow for the inclusion of both fixed and random effects coefficients, enabling results to generalize to a population of studies (rather than simply to the studies included in the analysis). Third, MLMs allow for the examination of moderators at the appropriate “level” of analysis, such that effect-size-level variables (e.g., measure of R/S) and study-level variables (e.g., percentage of the sample that are women) can be examined simultaneously.

Because most studies (52/73; 72.6%) included multiple assessments of the relationship between R/S and health ( $M = 4$  effect sizes), MLMs were used to examine our hypotheses. All analyses were conducted in the R statistical software environment (R Development Core Team, 2016), using the `rma.mv` function in the `metafor` package with restricted maximum likelihood estimation (Viechtbauer, 2010) and the `metaviz` package to produce forest plots (Kossmeier et al., 2020). The `coef_test` function in the `clubSandwich` package (Pustejovsky, 2020) was used to correct for biased estimations, using robust variance estimation because `rma.mv` does not account for the correlation of level-1 errors (Fernandez-Castilla et al., 2020). Restricted maximum likelihood estimation was used, and effect sizes were weighted by the inverse of their variance. Data were modeled using a three-level MLM that accounts for sample variance associated with each effect size (Level 1), variation within studies on indices such as the measures of constructs used (Level 2), and variation between studies (Level 3). Variation at level 1 was known (i.e., reported by each effect size), and consequently we only included random effects of variance at Level 2 and Level 3. Moderators were only examined as fixed effects at the level on which they were measured (i.e., assessment of R/S at Level 2), because the random effects for the slopes of moderating variables were judged to be either uninformative (in the case of moderators measured at Level 2) or not possible (in the case of moderators measured at Level 3).

The generalized equations for each level of our model can be found below.

Level 1:

$$z_{ijk} = \pi_{0jk} + e_{ijk}$$

where  $z_{ijk}$  is the effect of R/S on health for individual  $i$  within effect size  $j$  within *Study*  $k$  and  $\pi_0$  is the intercept, which is interpreted as the average effect size, and  $e_{ijk}$  is the error associated with sample variance, which is extracted from each coded study.

Level 2:

$$\pi_{0jk} = \beta_{00k} + \beta_{01k}L2VAR_1 + \beta_{02k}L2VAR_2 + \dots + r_{0jk}$$

where  $\beta_{00k}$  represents the average effect size when all moderating variables are held constant for a given Study  $k$ , where  $\beta_{01k}$ ,  $\beta_{02k}$ , and so forth represent the average value on a Level-2 variable for a given Study  $k$ , and where  $r_{0jk}$  represents error associated with study-level variation.

Level 3:

$$\beta_{00k} = \gamma_{000} + \gamma_{001}L3VAR_1 + \gamma_{002}L3VAR_2 + \dots + \mu_{00k}$$

where  $\gamma_{000}$  represents the fixed value for the intercept (the overall relationship between R/S and health among sexual minorities), where  $\gamma_{001}$ ,  $\gamma_{002}$ , and so forth represent the adjustment to the overall effect size ( $z_{ijk}$ ) made based on the value of a Level-3 variable, and where  $\mu_{00k}$  represents error variance associated with the intercept, which is between-study variation.

Prior to analyses, data were checked for outliers that had a standardized  $z$ -value larger than 3.29 or smaller than  $-3.29$  (Tabachnick & Fidell, 2012). A single outlier was found ( $r = -.53$ ; Wolff et al., 2016). Removing versus winsorizing this outlier did not change either the significance or substantiality of overall findings (the final effect size was .004 smaller with the outlier removed than winsorized). In conjunction with the fact that the outlier did not appear to be influential (Cook’s distance = .07), the outlier was retained. Several documents did not contain information about the gender, age, education level, or R/S of their participants. Studies missing these variables were eliminated from any analyses that examined these variables. Because several of our moderators were theoretically related (e.g., the representativeness of a sample and whether a sample drew participants from LGB venues), we conducted separate analyses for each moderating variable. Test statistics of individual coefficients, including standard errors, were based on the  $t$  distribution with  $k$  (number of effect sizes)  $- p$  (number of coefficients in the model) degrees of freedom ( $df$ ), and test statistics for moderator effects were based on the  $F$  distribution with  $df_{num} = p$  and  $df_{denom} = k - p$  (Knapp & Hartung, 2003).

### Results

Before analyzing the results of studies selected for the present meta-analysis, we first examined the characteristics of the meta-analyses we had searched to extract information for the present meta-analysis, in order to understand how frequently the fields of the psychology of religion and spirituality and the psychology of sexual orientation and gender diversity “speak” to each other. Of studies included in previous meta-analyses examining the influence of sexual orientation on health outcomes, 7.21% (21/291) included a measure of R/S, regardless of whether this measure was a focus of the study. Of studies included in previous meta-analyses

examining the influence of R/S on health outcomes, 4.11% (25/609) included an assessment of sexual orientation, regardless of whether sexual orientation was a focus of the study. In addition, we computed a simple mean of the average effect size reported across meta-analyses examining the relationship between R/S and health, which we found to be  $r = .15$  (see Table 1).

In preparation for data analysis for the 279 effect sizes included in the present meta-analysis, we examined the proportion of variation that could be explained at each level for the present meta-analysis. We found that 7.68% of the variation could be explained at Level 1 ( $\sigma^2 = .0027$ ), 16.97% of the variation could be explained at Level 2 ( $\sigma^2 = .0059$ ), and 75.34% of the variation could be explained at Level 3 ( $\sigma^2 = .0260$ ). Log-likelihood ratio tests that compared a null model to models that included random effects for variance at Level 2 or Level 3 confirmed that model fit was improved when including these variance components ( $p < .01$ ; Hox, 2010). These tests and the fact that substantial variation occurred at each level suggested that the inclusion of moderators at both the effect size (Level 2) and study (Level 3) level is likely to explain additional variation in the overall effect.

### Overall Effect

We first tested a null model that only included an intercept, in order to examine whether an overall relationship between R/S and health exists (Hypothesis 1 [H1]). The estimate of the intercept was small but significant ( $\gamma = .05$ ,  $t = 2.42$ ,  $p < .05$ , 95% CI [.01, .09]) indicating that there was a small but positive relationship between R/S and health among sexual minorities. In the overall model, substantial heterogeneity existed ( $\tau = .18$ ; 95% CI [.15, .22]; with  $\tau$  representing the total heterogeneity); the 95% prediction interval indicated that a randomly selected effect size within a randomly selected study is likely to be between  $-.30$  and  $.40$ . As suggested by the wide prediction interval and the variance components discussed above, significant heterogeneity existed in the effect size ( $Q_B(278) = 3196.87$ ,  $p < .01$ ), suggesting the potential for moderation effects. See Figure 2 and Figure B1 in Appendix B.

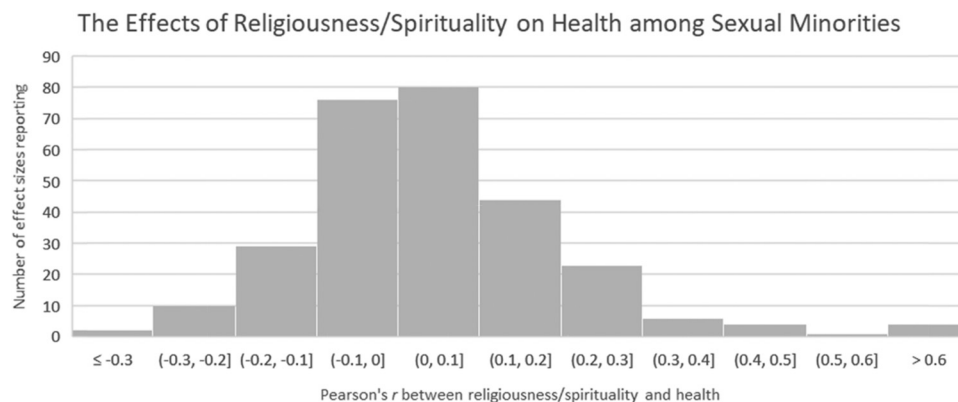
### Study Effects

Therefore, we examined models testing whether various study characteristics (Level 3) moderated the relationship between R/S and health. These models included publication year (centered for analysis), publication type, whether a study was published in a journal focusing on R/S, whether a study was published in a journal focused on sexuality, whether a study used randomization, whether a study used a representative sample, and whether participants were recruited from sexual minority venues and were conducted separately. None of the moderators exerted a significant effect on the overall relationship between R/S and health, except for whether studies sampled from LGB venues (see Table 2). This particular model indicated that the relationship between R/S and health was positive and substantially different than zero when participants were *not* sampled from LGB venues ( $\gamma_{\text{est}} = .16$ ,  $t = 3.10$ ,  $p < .05$ ; 95% CI [.09, .23]) and that when participants *were* sampled from LGB venues, the overall relationship between R/S and health observed was close to zero ( $\gamma_{\text{est}} = .01$ ,  $t = .39$ ,  $p = .68$ ). Accounting for sampling from LGB venues accounted for 6.7% of the overall heterogeneity, with a substantial amount of heterogeneity remaining ( $\tau_{\text{residual}} = .17$ ); in fact, this was one of the largest effects observed in the present study. Table 2 presents estimates the intercept ( $\gamma_{\text{int}}$ ) and moderation effects ( $\gamma_{\text{mod}}$ ) for each study effect, as well as estimates of the effect size for each level of dichotomous moderators ( $\gamma_i$ ), along with estimates of the residual heterogeneity ( $\tau$ ) and its confidence interval.

### Participant Effects

On average, studies reported a mean age of 32.27, with 65.49% of participants being men, 54.31% being White, and 44.09% having a bachelor's degree or higher. An average of 63.90% of the participants sampled reported some degree of religious affiliation. Because we used casewise deletion to handle missing data, many cases were excluded from analysis in the initial model that included one predictor (e.g., age) but not another (e.g., percent White). As such, we conducted separate analyses to examine if each potential participant variable significantly moderated the

**Figure 2**  
*Histogram Plotting the Magnitude of Effect Size Against the Number of Effect Sizes Reporting That Value*



**Table 2***The Overall Model and Influence of Study Characteristics on the Relationship Between Religiousness/Spirituality and Health*

Characteristic	<i>k</i>	$\Gamma_{int}$	<i>SE</i>	95% CI	<i>t</i>	$\Gamma_{mod}$	$\gamma_i$	<i>SE</i>	95% CI	<i>t</i>	$\tau$	95% CI
Overall model	73	.05	.02	[.01, .09]	2.42*	-.01		.04	[-.12, .11]	-0.12	.18	[.15, .22]
Source of study		.06	.03	[-.05, .16]	1.05						.18	[.15, .22]
Published	61						.05	.02	[<.01, .09]	2.05*		
Unpublished	12						.05	.05	[-.05, .16]	1.75		
R/S journal		.05	.02	[<.01, .09]	2.05*	<.01		.04	[-.10, .11]	0.05	.18	[.15, .22]
Yes	14						.05	.04	[-.04, .15]	1.07		
No	59						.05	.02	[<.01, .09]	2.05*		
Sexuality journal		.05	.02	[<.01, .09]	2.18	.01		.05	[-.08, .10]	0.15	.18	[.15, .22]
Yes	21						.06	.05	[-.02, .13]	1.16		
No	52						.05	.02	[<.01, .10]	2.18*		
Sampling method		.05	.02	[<.01, .09]	2.09*	.03		.05	[-.10, .17]	0.60	.18	[.15, .22]
Random	7						.08	.05	[-.05, .21]	1.61		
Convenience	66						.05	.02	[<.01, .09]	2.09*		
Representativeness		.05	.02	[.01, .09]	2.19*	.02		.06	[-.13, .16]	0.31	.18	[.15, .22]
Representative	6						.07	.05	[-.07, .21]	1.20		
Nonrepresentative	67						.05	.02	[<.01, .09]	2.20*		
Sampling location		.16	.05	[.09, .23]	3.10*	-.16		.05	[-.24, -.07]	-2.81*	.17	[.14, .20]
Included LGB venues	53						.01	.02	[-.04, .05]	0.42		
No LGB venues	20						.16	.05	[.09, .23]	3.10*		
Sampling location		.07	.03	[.02, .11]	2.46*	-.06		.04	[-.14, .03]	-1.48	.18	[.15, .22]
Included R/S venues	20						.01	.03	[-.07, .09]	0.39		
No R/S venues	53						.07	.03	[.02, .11]	2.46*		
Geographical location		.04	.04	[-.07, .15]	1.04	.01		.04	[-.11, .13]	0.31	.18	[.15, .22]
United States	63						.05	.02	[.01, .10]	2.23*		
Outside U.S.	10						.04	.04	[-.07, .15]	1.04		
Year of report		.05	.02	[.01, .09]	2.39*	<.01		<.01	[-.01, .01]	-0.52	.18	[.15, .22]
1999–2005	3											
2006–2010	8											
2011–2015	19											
2016–present	43											
Sample size												
≤99	5											
100–299	29											
300–499	18											
500–999	8											
≥1,000	9											

*Note.* LGB = lesbian, gay, and bisexual; R/S = religious/spiritual;  $\gamma_{int}$  = estimated intercept;  $\gamma_{mod}$  = estimate coefficient for each moderating variable (e.g., the significance of this coefficient indicates the presence or absence of moderation effects);  $\gamma_i$  = estimated coefficient for contrast-coded moderators (i.e., estimated effect size if only the level of a moderator indicated was included in the model); *k* = number of studies reporting a given level of a moderator.

\**p* < .05.

relationship between R/S and health with no other predictors in the model. We found that no participant variables significantly moderated the relationship between R/S and health (see Table 3).

### Measurement Effects

For each way of assessing R/S, sexual orientation, and health, we used subgroup analysis to examine whether the relationship between R/S and health was significantly different than zero. As such, we conducted four different models examining measurement characteristics (Level 2). Dummy-coded variables were created for each level of each measurement characteristic (e.g., well-being among health). An intercept was not included in the model, so that regression coefficients may be interpreted to indicate the relationship between R/S and health when a given level of a measurement characteristic was used. Coefficients are displayed in Table 4.

R/S was assessed in six different ways across studies: religious affiliation, nonorganizational religious behavior, organizational religious behavior, intrinsic religiousness, religious cognition

(including belief), and some mixture of these methods. When R/S was operationalized as religious cognition ( $\gamma = .10$ ,  $t = 2.48$ ,  $p < .05$ ; 95% CI [.03, .17]) or mixed assessments of R/S were used ( $\gamma = .20$ ,  $t = 3.45$ ,  $p < .05$ ; 95% CI [.09, .31]), the relationship between R/S and health was positive and significantly different than zero. However, given the heterogeneity and limited number of effect sizes included in the mixed assessment category ( $k = 11$ ), it is unclear if this effect has meaning. No relationship was observed between R/S and health when R/S was measured by other indicators. Assessments of R/S accounted for 5.03% of the variation in effect sizes ( $\tau_{residual} = .170$ ).

Spirituality was assessed as a dichotomous variable based on whether a study included an assessment of spirituality. When a study assessed R/S via spirituality, the relationship between R/S and health was positive and significantly different than zero ( $\gamma = .14$ ,  $t = 4.94$ ,  $p < .05$ ; 95% CI [.08, .19]). However, when a study's assessment of R/S did not focus on spirituality, the relationship between R/S and health did not differ from zero ( $\gamma = .04$ ,  $t = 1.85$ ,  $p = .07$ , 95% CI [-.01, .07]). This

**Table 3***The Influence of Participant Characteristics on the Relationship Between Religiousness/Spirituality and Health*

Characteristic	<i>k</i>	<i>M</i>	<i>SD</i>	$\Gamma_{\text{int}}$	<i>SE</i>	95% CI	<i>t</i>	$\Gamma_{\text{mod}}$	<i>SE</i>	95% CI	<i>t</i>	$\tau$	95% CI
Age	68	32.27	10.02	-.14	.11	[-.28, .01]	-2.09	.01	<.01	[-.01, .01]	1.64	.17	[.14, .21]
% women	72	34.51%	31.41%	.07	.04	[.02, .13]	2.06*	-.06	.06	[-.18, .06]	-1.01	.18	[.15, .22]
% White	58	54.31%	49.00%	.11	.06	[-.01, .23]	1.71	-.12	.09	[-.30, .04]	-1.29	.19	[.15, .23]
% with bachelor's	38	44.09%	26.94%	.09	.06	[-.02, .20]	1.50	-.05	.12	[-.27, .16]	-0.45	.19	[.15, .23]
% religious	58	63.90%	21.25%	-.09	.07	[-.22, .03]	-1.33	.21	.11	[-.01, .40]	1.86	.16	[.12, .20]

Note. *k* = number of studies reporting a given moderator;  $\gamma_{\text{int}}$  = estimated intercept;  $\gamma_{\text{mod}}$  = estimate coefficient for each moderating variable.

\**p* < .05.

variable accounted for 5.59% of the variation in effect sizes ( $\tau_{\text{residual}} = .17$ ).

Sexual orientation was assessed in four different ways across studies: as sexual attraction, sexual behavior, sexual identity, and a mixture of methods. When a study assessed sexual orientation as sexual identity, the relationship between R/S and health was positive and significantly different from zero ( $\gamma = .08$ ,  $t = 2.75$ ,  $p < .05$ ; 95% CI [.03, .12]). No relationship between R/S and health was observed when sexual orientation was assessed by other indicators (see Table 4). Of note, the majority of studies examined sexual orientation as sexual identity ( $k = 180$ ). The assessment of sexual orientation accounted for a relatively unsubstantial 1.12% of the variation in effect sizes ( $\tau_{\text{residual}} = .18$ ).

Health was assessed in six different ways across studies: as mental health, suicidality, well-being, substance use, physical health, and sexual health. The relationship between R/S and health was positive and significantly different than zero when health was assessed as well-being ( $\gamma = .08$ ,  $t = 2.85$ ,  $p < .05$ ; 95% CI [.03, .13]). No relationship between R/S and health was observed when health was assessed by other indicators (see Table 4). The assessment of health accounted for a relatively unsubstantial 1.12% of the variation in effect sizes ( $\tau_{\text{residual}} = .18$ ).

**Table 4***The Role of Measurement Characteristics in the Relationship Between Religiousness/Spirituality and Health*

Characteristic	<i>k</i>	$\Gamma_{\text{int}}$	<i>SE</i>	95% CI	<i>t</i>	$\tau$	95% CI
Religiousness						.17	[.14, .21]
Affiliation	57	-.02	.03	[-.08, .03]	-.73		
Nonorganizational religiousness	29	.04	.03	[-.03, .08]	1.13		
Organizational religiousness	70	.03	.02	[-.01, .08]	1.55		
Intrinsic religiousness	62	.03	.02	[-.01, .09]	1.42		
Cognitive religiousness	51	.10	.04	[.03, .17]	2.48*		
Mixed assessment	11	.20	.06	[.09, .31]	3.45*		
Spirituality						.17	[.14, .20]
Yes	244	.14	.03	[.08, .19]	4.94*		
No	35	.04	.02	[-.01, .07]	1.85		
Sexual orientation						.18	[.14, .21]
Attraction	14	<.01	.08	[-.16, .17]	0.05		
Behavior	26	-.06	.04	[-.14, .02]	-1.78		
Identity	180	.08	.03	[.03, .12]	2.75*		
Mixed assessment	59	.05	.04	[-.04, .13]	1.31		
Health						.18	[.14, .21]
Mental health	73	.04	.02	[-.01, .09]	1.63		
Suicidality	44	.04	.03	[-.03, .12]	1.68		
Well-being	69	.08	.03	[.03, .13]	2.85*		
Substance use	55	.04	.04	[-.04, .12]	0.96		
Sexual health	30	.03	.03	[-.04, .10]	0.88		
Physical health	8	<.01	.03	[-.11, .10]	-0.07		

Note. *k* = number of studies reporting a given moderator;  $\gamma_{\text{int}}$  = estimate coefficient for each moderating variable.

\**p* < .05.

To facilitate the interpretation of our results, we created a moderator forest plot (see Figure B2 in Appendix B). This figure displays the overall and moderation effects described above. Each effect is plotted as the relationship between R/S and health given that level of a moderator (e.g., for studies that sampled from LGB venues). Intervals around the effect size are confidence intervals based on the standard error of the intercept, indicating whether an effect size would likely be significantly different than zero after accounting for the moderator in question.

### Assessment of Bias

Multiple methods were employed to address the potential for publication bias, including searching for dissertations and theses, posting in relevant listservs, and contacting experts in the field (for unpublished manuscripts). To assess the possibility of publication bias, we plotted the effect sizes against the standard error and examined the distribution (Bettencourt et al., 2016). Figure B3 in Appendix B displays this contour-enhanced funnel plot. The symmetry of the distribution suggests little concern for publication bias. Noteworthy, however, is the wide distribution of studies' effects that have a small standard error (i.e., upper third of the

plot). This wide distribution suggests that studies with large sample sizes have revealed quite diverse findings about the relationship between R/S and health among sexual minorities.

### Discussion

Based on information reported by over 40,000 sexual minorities in 73 studies, this meta-analysis observed a small but positive relationship between R/S and health among sexual minorities ( $r = .05$ ). The relationship between R/S and health among sexual minorities most closely approximated that of the general population (mean  $r$  of .15, median of .16) when R/S was operationalized either as religious cognition/belief ( $r = .10$ ) or as spirituality ( $r = .14$ ).

### The Diverse Experiences of Sexual Minorities With Religion

Perhaps the clearest takeaway from this meta-analysis's results is that sexual minorities have diverse and complex experiences with R/S. Although heterogeneity is common in meta-analyses, we found a remarkable amount of heterogeneity in the synthesized studies. Effect sizes were relatively normally distributed and ranged from  $r = -.53$  to  $r = .77$  (see Figure 2); a 95% prediction interval indicated that a randomly selected effect size within a randomly selected study would likely be between  $r = -.31$  and  $r = .40$ . Whereas on average some sexual minority samples reported substantial harm from R/S (Dehlin et al., 2014; Severson et al., 2014), others described R/S as being unrelated to health (Hamblin & Gross, 2014; Rostosky et al., 2007), and still others described R/S as beneficial to their health (Barringer & Gay, 2017; Cranney, 2017). Because sexual minorities describe their relationships with R/S in such varied ways, we caution against overeager attempts to characterize a singular relationship between R/S and health among sexual minorities. These results suggest that the characterization either of "the Church" as a homonegative institution or of sexual minorities as nonreligious are oversimplifications of a complex reality, and such oversimplifications can distract from understanding the nuanced and varying nature of the relationship between R/S and health among sexual minorities (Lefevor, Paiz, et al., 2020). We suggest that instead of looking to characterize a singular relationship, it is likely more fruitful to examine the situations under which R/S tends to be more strongly versus weakly (or positively versus negatively) related to sexual minorities' health.

This caveat, however, does not diminish that more often than not, studies reported a positive relationship between R/S and various indicators of health. These results suggest that, like heterosexual individuals, sexual minorities generally report benefits associated with R/S—*when they choose to engage with R/S*. This relationship may operate through a variety of factors, including providing increased purpose and meaning (Park, 2013), enhancing connection and social support (Debnam et al., 2012), and improving coping resources and mechanisms (Pargament et al., 2013).

Results also suggest that not all sexual minorities see R/S as health-promoting. National statistics indicate that about 77% of the U.S. general population reports a religious affiliation (Pew Research Center, 2015); however, only 64% of participants included in the present meta-analysis reported a religious affiliation. Given that many studies included in this analysis focused participant

recruitment on religious individuals, the actual percentage of sexual minorities who affiliate religiously is likely lower, potentially closer to national estimates of 59% (Pew Research Center, 2015). Further, 116 effect sizes reported negative relationships between R/S and health, accounting for 42% of effect sizes sampled. These results suggest that many sexual minorities distance themselves from religion, and for these individuals, R/S may be detrimental to health.

### Minority Stress and Structural Stigma

Minority stress (Meyer, 2003) and structural stigma (Hatzenbuehler, 2009) theories would posit that R/S may be linked with health difficulties because many religious spaces have historically promoted and perpetuated homonegativity (Etengoff & Lefevor, 2020). Although the overall analysis failed to find the disparities predicted by these theories, several other trends in the data suggested that, for large segments of the global sexual minority population, minority stress and structural stigma are still at play in many religious spaces.

Perhaps most notably, sexual minorities evidenced differences in the average relationship between R/S and health, relative to heterosexual individuals. Meta-analyses examining the relationship between R/S and health in the general population have consistently found small-to-medium positive effects, averaging to  $r$ s of .15 to .16 (see Table 1). In contrast, we found a much smaller relationship among sexual minorities,  $r = .05$ . This finding that R/S is less health-promoting for sexual minorities than for heterosexual individuals is likely reflective of several internal and external dynamics. Internally, it may be difficult for sexual minorities to reconcile perceived conflicts between their R/S and their sexual orientation and identity (Dehlin et al., 2014). It might also be more difficult for sexual minorities to differentiate fully from the homonegative "religious residue" (Van Tongeren et al., 2020, p. 1) they internalized earlier in their lives. Externally, sexual minorities may often experience difficulty in navigating enacted stigma in religious places and in interactions with religious people (Lease et al., 2005). Indeed, many sexual minorities report psychologically, spiritually, or sexually abusive experiences, either in religious spaces or by religious individuals (Hall, 2018; Jacobsen & Wright, 2014). Whereas religious service attendance may be uncomplicatedly positive for most heterosexual individuals, sexual minorities often report experiencing feelings of hypervigilance, concealment, and fear when navigating religious spaces (Lefevor, Huffman, et al., 2020).

When R/S was operationalized as service attendance or as religious affiliation (as opposed to spirituality), no relationship was observed between R/S and health, further suggesting that factors may be at play for sexual minorities that are not at play for heterosexual individuals. For example, whenever they encounter religious spaces or people, sexual minorities might often experience *felt stigma* (that is, "knowledge of the existence of stigma and the conditions under which it is likely to be enacted, accompanied by the motivation to avoid being the target of stigma enactments [which is] often manifested in purposeful modification of behavior"; Herek & McLemore, 2013, p. 313). In fact, many sexual minorities may even experience symptoms of posttraumatic stress when navigating religious spaces or interacting with highly religious individuals, based on recurrent negative (perhaps traumatic) experiences they have had (Lefevor, Huffman, et al., 2020). It therefore might be extremely difficult for such sexual minorities to

feel psychologically and physiologically safe in religious spaces and with religious people. Understandably, these sexual minorities may behaviorally avoid religious spaces and people, or they may transform their religion/spirituality into something that is primarily practiced individually (e.g., personal spirituality) rather than communally (e.g., as part of a faith community; Rodriguez, 2010).

Indeed, empirical evidence suggests some sexual minorities respond to stigma and discrimination by separating themselves from religious places and individuals (Lefevor et al., 2018), whereas others respond by cultivating an individualized relationship with a deity, separate from formal religious institutions (e.g., spirituality; Watson et al., 2019). Our meta-analytic results support both trends, in that (a) fewer participants sampled reported a religious affiliation than the general population and (b) when sexual minorities reported the relationship between spirituality and health, this relationship was positive ( $r = .14$ ) and mirrored the relationship observed in the general population (see Table 1).

One way that sexual minorities have historically coped with minority stress and structural stigma has been through turning to similar others in places such as community centers, LGBTQ bars/clubs, and Pride events. This kind of group support has been linked with resilience (Hall, 2018; Meyer, 2003). Our results suggest that sexual minorities who access these kinds of group resources—or at least those who are surveyed from these venues—are much less likely to report a positive relationship between R/S and health. These results may suggest that sexual minorities who are engaged in LGBTQ venues may find support and health-benefits from their engagement in LGBTQ communities rather than from religious communities. Indeed, some research has indicated that religious sexual minorities find support from *either* LGBTQ *or* religious communities (Lefevor, Sorrell, et al., 2020), although certainly some find support from both sources (Mahaffy, 1996).

### Examining Causal Pathways

Despite evidence of minority stress and structural stigma, results suggested that R/S most often evidenced a positive relationship with health. However, the relationship between R/S and health varied significantly based on how R/S and health were conceptualized and measured. Koenig et al.'s (2012) causal pathways theory suggested that psychological, social, and behavioral pathways may account for this positive relationship, where present. Moderation analyses based on conceptualizations of R/S and/or health provide some support for psychological pathways and potential support for social and behavioral pathways.

R/S may promote health through several psychological pathways, including encouraging meaning-making, promoting positive emotionality, and influencing individuals' views of self, others, and the world (Koenig, 2012; Park et al., 2017; Van Cappellen et al., 2016). Although we were not able to test any of these pathways directly (indeed only 13 of the 73 studies examined putative mechanisms of the relationship between R/S and health, and only four of these 13 examined the same putative mechanism), moderator analyses suggest that R/S operates along all three of these psychological pathways. When health was conceptualized as well-being—which definitionally is comprised of constructs such as positive emotion, engagement, and meaning (Seligman, 2012)—a positive relationship emerged between R/S and health among

sexual minorities. In light of the lack of a significant relationship between R/S and other operationalizations of health (e.g., psychological distress, physical health), these results may suggest that R/S is particularly health-promoting because of its relationship to meaning-making and positive emotionality. This possibility is in line with growing empirical evidence that R/S impacts people's well-being via its impact on meaning-making (Park et al., 2017) and positive emotions (Van Cappellen et al., 2016).

Additionally, moderation analyses that examined how R/S was conceptualized indicated that R/S evidenced the strongest relationship with health when R/S was conceptualized as "cognitive" R/S. Measures of cognitive R/S primarily included measures of religious belief. Religious belief may be particularly health-promoting because it can enhance people's sense of meaning in life and thereby promote their health and well-being (Park, 2013; Park et al., 2017). Meaning in life has been defined as "the extent to which one's life is experienced as making sense, as being directed and motivated by valued goals, and as mattering in the world" (George & Park, 2016, p. 206). In other words, meaning encompasses three interrelated dimensions: comprehension, purpose, and mattering (George & Park, 2016). For sexual minority believers (and religious believers in general), their R/S beliefs can help them cultivate and sustain a sense of comprehension (their life and the world make coherent sense), purpose (they have a valued direction in life), and mattering (their life has significance, value, and importance; George & Park, 2016). In so doing, R/S beliefs may help promote their health/well-being and their ability to cope (Park, 2010, 2013).

The implications of the results on social and behavioral pathways are less clear. When R/S was assessed as affiliation or participation in worship services, no relationship was observed between R/S and health, contrary to what would be expected based on the social-pathways hypothesis. Similarly, no relationship was observed between R/S and health when health was assessed as substance use or sexual health—both of which are conventionally tied to the behavioral pathways by which R/S might influence health (Koenig et al., 2012; Rosmarin & Koenig, 2020). It may be that social and behavioral R/S are often more complicated for sexual minorities. Because religious sexual minorities may experience stigma and rejection from both religious and sexual minority individuals (Lefevor, Huffman, et al., 2020), there may be a cancelling effect by which their R/S affects their health via social and behavioral pathways. For instance, sexual minorities may experience some degree of social support if they are involved in a religious community (which would promote their health), but they may also experience some degree of negative social interactions (which would undermine their health). Similarly, sexual minorities may experience some degree of social support from involvement in sexual minority communities; however, they may simultaneously experience rejection for their R/S, cancelling out some of the potential benefits of R/S. Indeed, research has suggested that sexual minorities typically engage in either conservative religious or sexual minority communities but rarely both (Lefevor, Sorrell, et al., 2020).

Another possible explanation for why the behavioral-pathways hypothesis was not supported among sexual minorities is that sexual minorities may often derive a considerable amount of their social support from their local LGBTQ+ community, and members in LGBTQ+ communities often hold more behaviorally permissive values regarding sexual behavior and substance use than conventionally religious communities. Some sexual minorities may thus align more closely with their local LGBTQ+ community, and that

might have a positive impact on their health, because of the enhanced sense of social support and acceptance they experience in that community. Other sexual minorities may choose to align more closely with the traditional sexual and behavioral ethics that are prevalent within a conventionally religious community in which they are involved, but that might often have a harmful effect on their health, because so aligning could fuel internalized self-stigma, sexual and behavioral guilt, and moral religious/spiritual struggles.

### **Implications for Research**

The results carry more implications for research than we have the space to unpack thoroughly. Particularly given the vast amount of unexplained heterogeneity, this meta-analysis's results leave several unanswered research questions that would be worth pursuing such as, "Are there specific R/S practices that are nearly universally health-promoting among sexual minorities?"; "Are there specific contexts (R/S or otherwise) that are typically health-promoting/damaging for sexual minorities?"; "How does sexual minorities' R/S and sexual identity development influence the way R/S relates to their health?" Nonetheless, to help guide researchers who study R/S and/or sexual minorities, we provide several recommendations for future research, based on these meta-analytic findings.

#### ***Pay Attention to Sampling Venue***

Despite accounting for nearly 75% of all individuals studied, sexual minorities sampled from LGB venues had a characteristically different relationship between R/S and health than participants recruited in other ways. Sexual minorities who are active in LGB venues may be more likely to be young, White, and liberal than sexual minorities generally (Han, 2007; Swank et al., 2020). At a minimum, researchers should be mindful of these differences. Ideally, researchers should employ a wider variety of recruitment strategies, either in order to eliminate or account for this bias (Meyer & Wilson, 2009). For example, researchers might post recruitment advertisements in a variety of venues, including news media or community venues that are not explicitly LGB focused (e.g., a Latinx community center, a local coffeeshop). If researchers determine community sampling is important, then they may benefit from being intentional about recruiting LGB individuals both from liberal and conservative venues (e.g., religious support groups for sexual minorities; Lefevor, Beckstead, et al., 2019).

#### ***Strive for Religious Inclusivity***

When studies used targeted sampling based on religion, the vast majority targeted Christian participants. Further, 86% of studies were conducted in the United States, with these studies typically focusing on Judeo-Christian religions. Much less is known about the experiences of sexual minorities who live in other countries or who affiliate with a non-Judeo-Christian religion. Future research should explore a variety of faith traditions, as previous scholars have suggested (Etengoff & Rodriguez, 2020; Rodriguez, 2010).

#### ***Recruit a More Diverse Sample of Sexual Minorities***

The average participant studied was a 32-year-old, White man from the United States. A substantial amount of research also examines the experiences of Black men who have sex with men (Carrico et al., 2017; Freeman, 2018). However, sexual minorities

who are women, are other racial/ethnic minorities, are older adults and/or are from outside the U.S. are not yet represented meaningfully in this literature. Given that R/S experiences may vary across gender, race/ethnicity, and age (Lefevor, Smack, et al., 2020), targeted sampling of underrepresented individuals is needed.

#### ***Account for Developmental Stage***

We found that studies that specifically assessed sexual identity reported marginally stronger relationships between R/S and health. Identity integration may be responsible for some of these trends. Where possible, research should include measures of sexual identity development and integration (e.g., Measure of Sexual Identity Exploration and Commitment; Worthington et al., 2008), in order to account for developmental changes (e.g., Etengoff & Rodriguez, 2020). We particularly encourage future research examining adolescence and emerging adulthood, as both are characterized by concerns with identity development and integration (Arnett, 2000; Erikson, 1968; Marcia, 1966), which may affect how individuals relate to R/S (Ream & Rodriguez, 2014).

#### ***Examine Causality Through Longitudinal Studies***

All the studies surveyed were cross-sectional investigations. Longitudinal studies with matched control groups of heterosexual participants would be important in understanding affiliation trends over time, given cross-sectional disparities between sexual minority and heterosexual individuals. Longitudinal studies are particularly important for helping understand the long-term effects of early R/S—and potential structural stigma (Hatzenbuehler, 2009)—including their likely disproportionate influences on sexual minorities, relative to heterosexual individuals. Secondary data analysis of longitudinal surveys that assess both R/S and sexual orientation, such as the National Survey of Family Growth (Centers for Disease Control and Prevention, 2020), Add Health (University of North Carolina Population Center, 2020), and Midlife in the United States (University of Wisconsin, Madison, 2018) surveys, might be a good starting place for this kind of research.

#### ***Measure Both Religiousness/Spirituality and Sexual Orientation***

At present, only about 5% of the studies examining the effects of R/S or sexual orientation on health have assessed both constructs. Including a single-item measure of R/S (e.g., organizational religiousness; Koenig & Büsling, 2010) or sexual orientation (e.g., sexual identity; Lefevor, Park, et al., 2020) would significantly improve our collective understanding of the interplay of R/S and sexual orientation. Where survey space permits, we encourage a multifaceted assessment of both constructs (e.g., the DUREL for R/S; Koenig & Büsling, 2010; sexual attraction, behavior, and identity for sexual orientation; Lefevor, Park, et al., 2020). Such inclusion is necessary to be able to understand the potential mechanisms that may explain the relationship between R/S and health.

#### ***Study Context***

Sexual minorities evidenced a high degree of variability of relationships between R/S and health. Moderator analyses accounted for a portion of the contextual factors that explain this variation (e.g., age, sampling location); however, many factors were not explored. In particular, how well sexual minorities' communities

and social networks support their sexual and/or religious identities may be particularly influential in how sexual minorities resolve any perceived identity conflict (Lefevor, Sorrell, et al., 2020; Rodriguez, 2010). Future research should seek to identify additional variables that may moderate the relationship between R/S and health.

### *Extend Results to Gender Minorities*

Frequently, studies about sexual minorities are thoughtlessly applied to gender minorities (Moradi et al., 2016). Too few gender minorities were sampled to conduct a meaningful meta-analysis at present. However, a growing literature examines the way R/S affects gender minorities' health (Lefevor, Boyd-Rogers, et al., 2019; Rodriguez & Follins, 2012). More research and eventual meta-analyses are needed to understand how R/S is related to health for gender minorities.

### **Limitations**

As with any meta-analysis, ours is inevitably limited by several factors. The present analysis was only able to examine studies that had been published and reported an effect size. Thus, we were only able to aggregate data on topics and populations deemed worth studying, and we were unable to include the wealth of information found in qualitative studies. As such, LGB, White, Protestant, Christian sexual minorities are overrepresented in our study, and the experiences of sexual minorities who reject sexual identity labels, affiliate with more conservative religious backgrounds, and/or are people of color are underrepresented. Because multilevel meta-analysis seeks to generalize to the population of studies that have been conducted, this study as a whole ought to be interpreted as a synthesis of the quantitative research that has been done and not entirely as an understanding of the true nature of the relationship between R/S and health among sexual minorities. We particularly caution readers against an overly generalized interpretation of our results. Given the substantial variability observed, discussing only a single relationship between R/S and health among sexual minorities may not be possible. Finally, like all meta-analyses, several researcher judgment calls were made throughout the coding process, and any of these may also have affected our findings. In particular, we acknowledge that judgments in the categorization of measures of R/S and health may have added to error in the present study. We hope that others will replicate and update our results as time passes, in order both to verify the results and to illuminate how the relationship between R/S and health among sexual minorities may change as social forces continue to shift.

### **Conclusions**

Our analysis of 279 effect sizes from 73 studies indicated that overall, religiousness/spirituality appear to be positively though minimally related to health among sexual minorities ( $r = .05$ ); however, there is substantial heterogeneity in this effect. R/S appears to relate to sexual minorities' health most clearly through psychological pathways (such as religious belief or a personal relationships with the Divine), although R/S may also relate to health through social and behavioral pathways. Despite the overall positive relationship between R/S and health, we found evidence that structural stigma and minority stress may be operative in diminishing the frequency with which sexual minorities affiliate religiously and the relationship

that religious participation may have with their health. Overall, our findings suggest that the degree to which R/S is positively or negatively related to sexual minorities' health depends on (a) where the individual is in their sexual identity development/integration; (b) what their current R/S beliefs, practices, and motivations are; and (c) how well their environmental circumstances support their sexual and/or religious identities. As policymakers and voters grapple with the tensions between LGBTQ and religious rights, these results serve as a clear reminder that there is not a single sexual minority experience with religion. Rather, sexual minorities evidence a variety of experiences and effects of religious participation, including those that are beneficent, benign, and maleficent.

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