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Published in:
Psychology of Sexual Orientation and Gender Diversity

DOI:
[10.1037/sgd0000432](https://doi.org/10.1037/sgd0000432)

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Document Version
Publisher's PDF, also known as Version of record

Publication date:
2021

[Link to publication in University of Groningen/UMCG research database](#)

Citation for published version (APA):

Kiekens, W. J., la Roi, C., & Dijkstra, J. K. (2021). Sexual identity disparities in mental health among U.K. adults, U.S. adults, and U.S. adolescents: Examining heterogeneity by race/ethnicity. *Psychology of Sexual Orientation and Gender Diversity*, 8(4), 407-419. <https://doi.org/10.1037/sgd0000432>

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Sexual Identity Disparities in Mental Health Among U.K. Adults, U.S. Adults, and U.S. Adolescents: Examining Heterogeneity by Race/Ethnicity

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Lesbian, gay, and bisexual (LGB) people report poorer mental health than heterosexual people. However, there is heterogeneity in this disparity, and a racial/ethnic minority identity can contribute to this heterogeneity. When studying the intersecting effect of sexual identity and race/ethnicity on mental health, research often limits race/ethnicity categories, often uses adult samples from the U.S., and often uses samples that are not nationally representative. To overcome these limitations, the present study examined racial/ethnic heterogeneity in mental health disparities between heterosexual and LGB people in three nationally representative samples. The samples used were the 2011–2012 Understanding Society (U.K. adults; $N = 43,904$), the 2015 National Survey on Drug Use and Health (U.S. adults; $N = 43,313$), and the 2015 Youth Risk Behavior Survey (U.S. adolescents; $N = 15,122$). Using these samples enabled us to contrast the intersection of sexual identity and race/ethnicity across countries (for adults), and between life phases (in the U.S.). Across all three samples, LGB people—and particularly bisexual people—had a higher risk of impaired mental health than heterosexual people. For U.K. adults and U.S. adults, no intersecting effect of sexual identity and race/ethnicity were found. LGB adolescents of color reported better mental health compared with White LGB adolescents. More specifically, Black LGB adolescents reported better mental health compared to White LGB adolescents. Together, the present study contributes to a better understanding of the heterogeneity in mental health disparities for LGB people.

Public Significance Statement

Mental health disparities for sexual minority people are found in both the U.S. and the U.K. Among U.S. adolescents, the negative effect of sexual identity was smaller among LGB adolescents of color and Black LGB adolescents specifically.



Keywords: mental health, sexual identity, race/ethnicity, adults, adolescents

Research has repeatedly found mental health disparities between lesbian, gay, and bisexual (LGB) and heterosexual people, with LGB people showing higher rates of mood and anxiety disorders and more substance use and suicide attempts than heterosexual people (King et al., 2008; Marshal, Dietz et al., 2011; Marshal, Friedman et al., 2008). Minority stress—which refers to the stressors uniquely experienced by LGB people, like heterosexual discrimination, internalized heterosexism, or concealment of

identity—has been proposed as an explanation for these health disparities (Hatzenbuehler, 2009; Meyer, 2003). However, some LGB people have worse mental health than others, and it is crucial to better understand this heterogeneity in mental health among LGB people to provide more specific support for these people.

One factor that can contribute to this heterogeneity is race/ethnicity, which is understood as a social group or category de-

This article was published Online First August 6, 2020.

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Wouter J. Kiekens wants to thank Joseph Clements for proofreading the

manuscript. Chaïm la Roi acknowledges funding from two research projects funded by the Swedish Research Council for Health, Working Life and Welfare (FORTE) when preparing this article for submission: *YOUNG* [2012-1741] and *Interlocking Inequalities* [2016-07099].

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financed by observable physical characteristics or putative ancestry (Foner, 2018). Having a racial/ethnic minority status is especially relevant because it could make LGB people of color more susceptible as well as more resilient to sexual identity-related minority stressors affecting their mental health. On the one hand, sexual minority people of color might experience higher levels of minority stress, which may stem from strong traditional gender roles, conservative religious beliefs, or abandoning certain cultural values within their racial/ethnic community (Pachankis & Goldfried, 2004), and are more affected by these minority stressors compared to White sexual minority people (Moradi et al., 2010). On the other hand, people of color learn skills during their youth from their parents for coping with race/ethnicity-related stigma (Hughes et al., 2006), or acquire coping skills from experiencing racial/ethnic stigma-related stress themselves (Vaughn, Roesch, & Aldridge, 2009). These coping skills could help them to cope with sexual identity-related stressors later in life, whereas White LGB people do not acquire these skills.

Past research on racial/ethnic heterogeneity in sexual identity-based mental health disparities tended to use limited race/ethnicity categories (e.g., using a dichotomous racial/ethnic minority variable), often used U.S. adult samples, and often used samples that are not nationally representative. Therefore, we used three separate nationally representative data sets to examine differences in mental health (defined by psychological stress or strain) by sexual identity and racial/ethnic minority status in samples of U.S. adults, U.K. adults, and U.S. adolescents. Using these data sets provided us with the unique opportunity to explore the effects of the intersection of sexual identity and race/ethnicity across different national contexts and life phases and shed light on mental health differences in this at-risk group.

Mental Health of LGB People

Compared to heterosexual people, LGB people report poorer mental health (Plöderl & Tremblay, 2015). The minority stress framework is often used to explain these differences (Meyer, 2003). In the minority stress framework, four stigma-related stressors negatively affect LGB people's mental health. First, there are external/objective stressful events, which are explicit sources of stress, such as being harassed because of one's sexual identity. Vigilance to external/objective stressful events comprises a second type of minority stressor. Here, the stress stems from expecting and avoiding situations in which external/objective stressful events might happen. Internalized homophobia, which refers to negative attitudes in society against LGB people that are being directed to the self, forms the third type of minority stressor. Lastly, actively concealing one's sexual identity can be considered the fourth type of minority stressor, where stress stems from, for example, not being able to express one's identity and live an authentic life.

The psychological mediation framework (Hatzenbuehler, 2009), which extends the minority stress framework, is another framework explaining disparities in mental health between LGB and heterosexual people. The psychological mediation framework posits that LGB people are exposed to increased stress resulting from sexual identity-related stigma. These minority stressors create elevations in emotion dysregulation, social/interpersonal problems, and cognitive processes, resulting in higher risks for psychopathology. Thus, intra- and interpersonal psychological processes

mediate the relation between minority stressors and mental health (e.g., Kiekens et al., 2020; Timmins, Rimes, & Rahman, 2020).

There is ample evidence of stigma-related processes explaining the worse mental health of LGB adults. Research finds higher suicidal ideation in LGB adults who experience more homophobia and general violence and report a lower degree of outness (Plöderl et al., 2014). Furthermore, stigma-related stress increases the risk of depression (Timmins et al., 2020) and anxiety (Reitzel, Smith, Obasi, Forney, & Leventhal, 2017) in LGB adults. In community samples of LGB adults, gay-related stress (Lewis, Derlega, Griffin, & Krowinski, 2003) and discrimination (Fingerhut, Peplau, & Gable, 2010) were related to worse psychological well-being.

Not only for adults, but also among LGB adolescents, evidence of stigma-related processes explaining worse mental health is found. For example, higher rates of sexual identity-related victimization were associated with more suicidal ideation (Baams, Grossman, & Russell, 2015). Sexual identity-related stressful life events and negative attitudes toward homosexuality were related to anxious symptoms six months later among sexual minority youth (Rosario, Schrimshaw, Hunter, & Gwadz, 2002). Furthermore, stigma-related stress and sexual identity-related victimization increase the risk of depression in LGB adolescents as well (Mustanski, Andrews, & Puckett, 2016; Vanden Bergh, Dewaele, Cox, & Vincke, 2010). In schools, homophobic victimization by peers predicts mental health problems in LGB students, especially for girls (Poteat & Espelage, 2007).

Together, LGB people have poorer mental health than heterosexual people, and there is ample evidence to suggest that this disparity is a result of LGB people facing stigma-related stressors that their heterosexual counterparts do not experience. In summary, we expect that

H1: LGB people have poorer mental health than heterosexual people.

Intersecting Identities

Although research has found that LGB people have worse mental health compared to heterosexual people, some LGB people fair better than others. One factor that can attribute to this heterogeneity is having a racial/ethnic minority identity. From an intersectionality point of view, the experiences of people at the intersection of different social demographic categories, such as sexual identity and race/ethnicity, are shaped differently by social power (Bauer & Scheim, 2019; Crenshaw, 1989). That is, people that live at the intersection of specific sexual and racial/ethnic identities constitute a unique intersectional space that comes with its unique power and privileges, or lack thereof (Bauer, 2014), which could affect mental health.

In general, racial/ethnic discrimination is related to poorer mental well-being (Benner et al., 2018; Paradies et al., 2015), but some racial/ethnic minority groups often report better mental health compared with White people in general population samples. For example, a meta-analysis found no differences in the lifetime prevalence of major depressive disorders between White and Latino people and only slightly higher prevalence of depressive symptoms among Latino people (Menselson, Rehkopf, & Kubzansky, 2008). Similarly, Black people have repeatedly been found to report better mental health than White people (Barnes, Keyes, &

Bates, 2013; Erving, Thomas, & Frazier, 2019). Interestingly, the better mental health of people of color was not found in Europe, where racial/ethnic minorities report more depressive symptoms, especially in Western and Northern Europe (Missinne & Bracke, 2012). Thus, in the general population, people of color may report better mental health compared to White people, but how do minority sexual and racial/ethnic identities intersect to affect mental health?

One way sexual and racial/ethnic identities intersect to affect mental health negatively is explained in the greater risk perspective (Moradi et al., 2010). Here it is argued that sexual minority people of color experience higher levels of minority stress and are more affected by these stressors than White sexual minority people. It has been suggested that this greater risk for sexual minority people of color may stem from, for example, strong traditional gender roles, conservative religious beliefs, or the view that sexual minority people of color abandon certain cultural values (Pachankis & Goldfried, 2004). However, these more severe experiences of minority stress do not always result in differences in mental health between White and sexual minority people of color (Velez, Watson, Cox, & Flores, 2017).

Racial/ethnic minority identities might also intersect in such a way to make sexual minority people of color more resilient to minority stressors (Moradi et al., 2010). One way this manifests is by people of color being taught skills by their parents during their youth for coping with race/ethnicity-related stigma, referred to as ethnic socialization (Hughes et al., 2006). Parents can promote distrust, emphasizing the need for wariness in interracial interactions, which is communicated in cautions about barriers to success due to their race/ethnicity. Furthermore, parents make their children aware of discrimination and prepare them for coping with it, referred to as preparation for bias. These learned coping skills can help LGB people of color to cope with sexual identity-related stigma (Herek & Garnets, 2007). White LGB people are not racially socialized to cope with race/ethnicity-related stigma, making them less resilient to stigma. As such, the mental health of LGB people of color might suffer less from sexual identity-related stressors than the mental health of White LGB people.

Similarly, following the stress-related growth literature (Caplan, 1964), it is expected that LGB people of color learn skills from experience, enabling them to be able to cope with stigma-related stressors better than White LGB people. People can perceive certain stressors as learning opportunities with possible positive outcomes, such as acquiring coping skills (Cox, Dewaele, van Houtte, & Vincke, 2010). People of color can acquire specific coping skills from experiencing race/ethnicity-related stressors (Vaughn et al., 2009) that help them cope with sexual identity-related stressors later in life. White LGB people do not acquire these coping skills related to stigma early in life, which could result in them being more strongly affected by sexual identity-related stress.

Following expectancies proposed by the ethnic socialization and the stress-related growth literature, it is expected that the mental health of LGB people of color suffers less from sexual identity-related stressors than the mental health of White LGB people. Prior empirical research found that White LGB adults and adolescents report poorer mental health compared to LGB adults and adolescents of color (Bostwick et al., 2014; Consolacion, Russell, & Sue, 2004; Kertzner, Meyer, Frost, & Stirratt, 2009; Rodriguez-Seijas,

Eaton, & Pachankis, 2019; Russell & Truon, 2001), although some did not (Almazan, 2019). Taken together, we hypothesize the following:

H2: The negative association between an LGB identity and mental health is weaker among people of color than among White people.

The Present Study

We identified four limitations of research that examined how the intersection between sexual identity and race/ethnicity is associated with mental health. First, some research has used binary variables for race/ethnicity (e.g., Almazan, 2019; Kertzner et al., 2009; Velez et al., 2017), limiting our understanding of potential differences between ethnic/racial groups. Second, studies often use adult samples (e.g., Almazan, 2019; Kertzner et al., 2009; Rodriguez-Seijas et al., 2019; Velez et al., 2017), inhibiting our knowledge on the association between the intersection of sexual identity and race/ethnicity and mental health among adolescents. Such research among adolescents is especially relevant considering that sexual identity and race/ethnicity are (among others) characteristics of the self that are being shaped during adolescence, which is especially challenging as both identities might be stigmatized (Consolacion et al., 2004). Third, only four studies were identified that used nationally representative data sets (i.e., data sets representative of the population of a country; Almazan, 2019; Consolacion et al., 2004; Rodriguez-Seijas et al., 2019; Russell & Truon, 2001). Not using representative data sets can result in potential bias (Kuyper, Fernee, & Keuzenkamp, 2016). Last, research on this intersection and the association with mental health has primarily been conducted in the U.S., which has two drawbacks. First, although some studies use representative data, their findings can only be generalized to the U.S. Second, despite certain racial/ethnic groups facing similar barriers in both countries (Foner, 2018), different historical and social contexts have led to more political strategies, notions of rights, and public discourse on diversity in the U.S. compared to the U.K. (Better, 2008; Foner, 2018; Vertovec, 2007). This could lead to differences in how the intersection between sexual identity and race/ethnicity is associated with mental health between the U.K. and the U.S.

In order to overcome these limitations, we investigated the intersection of sexual identity and race/ethnicity, and its association with mental health in three nationally representative samples. The first data set is the 2011–2012 Understanding Society study, a longitudinal social survey from the U.K. The second is the 2015 National Survey on Drug Use and Health (NSDUH), a repeated cross-sectional study from the U.S. The third is the 2015 national Youth Risk Behavior Survey (YRBS), a repeated cross-sectional American study of adolescents in Grades 9 to 12. The benefit of analyzing national representative data sets of U.K. and U.S. adults is that it enabled us to present side-by-side assessments of the association between sexual identity and racial/ethnic minority identity, and mental health among adults in different contexts. Additionally, using a nationally representative data set of U.S. adolescents, we were also able to present side-by-side assessments of the association between sexual identity and race/ethnicity, and mental health in different life phases in the U.S.

Method

Data and Sample

U.K. adults. The third wave of the Understanding Society survey ($N = 49,739$) was used, which was collected in 2011–2012 (Lynn, 2009). This sample consists of the General Population Sample (GPS), the Ethnic Minority Boost Sample (EMBS), and the General Population Comparison (GPC). We only describe the data collection of the GPS because of space limitations and because the GPS comprised the largest part of the data and because information on the collection of the EMBS and the GPC is reported elsewhere (Lynn, 2009). The GPS for England, Scotland, and Wales was collected in two stages. In the first stage, postcode sectors were selected as the primary sampling units. Sectors with fewer than 500 residential addresses were grouped with an adjacent sector and treated as one postcode sector after that. The list of sectors was then sorted into 12 geographical strata, which were further subdivided based on the proportion of household reference persons classified as a nonmanual worker, the population density of the sector, and racial/ethnic minority density of the sector. In the second stage, a systematic random sample of 2,640 sectors was drawn from this sorted list. For 24 months, every month, 110 of these sectors were sampled. Within each of these 110 sectors, 18 addresses were selected to take part in the survey. For the Northern Ireland sample, a one-stage design was chosen where 2,395 addresses were selected from all domestic addresses. Only respondents older than 17 and who were personally interviewed were included in the present study, resulting in a final sample of $N = 43,904$ ($M_{\text{age}} = 48.71$, $SD = 17.78$).

U.S. adults. The 2015 NSDUH study ($N = 57,146$) was selected with a five-stage sample design to create a sample of the civilian noninstitutionalized (e.g., people who are not imprisoned) population of the U.S. (Center for Behavioral Health Statistics & Quality, 2018). For the first stage, states were divided into state sampling regions (SSRs) based on composite size measures. Within each SSR, eight census tracts were selected, which served as the primary sampling unit. For the second stage, one census block group per census tract was selected with probability proportionate to a composite size measure. For the third sampling stage, each census block group was partitioned into small geographic areas composed of adjacent census blocks. These small geographic areas, or segments, are the tertiary sampling unit. One segment was selected within each census block group, with the probability proportionate to the segment's size. For the fourth sampling stage, dwelling units within each segment were selected to meet the minimum sample sizes for all age groups needed for the study. In the last stage, individuals within the dwelling units were selected. Interviewers visited each sampled dwelling unit to list the eligible individuals for this study. Only respondents older than 17 were included in the present study, resulting in a final sample of $N = 43,313$ (Mdn age group = 26–34 [only age ranges were available in this dataset]).

U.S. adolescents. For the 2015 national YRBS ($N = 15,625$), a three-stage cluster sample design was used to create a sample of all public and private schools with students in Grades 9 to 12 in 50 states of the U.S. and the District of Columbia (Kann et al., 2016). The first stage consisted of 1,259 primary sampling units, which were counties, subareas of large counties, or groups of smaller

adjacent counties. These units were categorized into 16 strata according to their metropolitan statistical area status and the percentages of Black and Hispanic students in the sampling unit. Fifty-four of the 1,259 primary sampling units were then sampled with the probability of being sampled proportional to the overall school enrollment size for the primary sampling unit. In the second stage, from these 54 sampling units, 180 schools with students in any of the Grades 9–12 were sampled with the probability of being sampled proportional to school enrollment size. In the last stage, a random sample of one or two classrooms in each of Grades 9 to 12 was drawn within each participating school. The final sample consisted of $N = 15,122$ respondents (Mdn age 16 [only age groups were available in this dataset]).

Measures

Independent variable: Sexual identity.

U.K. adults. Respondents were asked, “Which of the following options best describes how you think of yourself?” Response options were *heterosexual* (1), *gay or lesbian* (2), *bisexual* (3), *other* (4), and *prefer not to say*. *Prefer not to say* was coded as missing ($n = 1,243$). To facilitate better comparisons across data sets, respondents who answered *other* were removed from the data set ($n = 406$).

U.S. adults. Respondents' sexual identity was assessed by asking, “Which one of the following do you consider yourself to be?” Response options included *heterosexual (straight)* (1), *lesbian or gay* (2), *bisexual* (3), or *do not know* (4). Respondents who answered *do not know* were removed from the data set for better comparison across data sets ($n = 248$).

U.S. adolescents. Respondents were asked, “Which of the following best describes you?” Response options included *heterosexual (straight)* (1), *gay or lesbian* (2), *bisexual* (3), and *not sure* (4). Respondents who answered *not sure* were removed from the data set to improve comparability across data sets ($n = 503$).

Independent variable: Race/ethnicity.

U.K. adults. Respondents were asked to indicate their race/ethnicity. There were 17 response options (*White: British, Irish, Gypsy/Traveler, other White; Asian: Indian, Pakistani, Bangladeshi, Chinese, other Asian; Black: Caribbean, African, other Black; Arab; Mixed: White and Caribbean, White and African, White and Asian; and other ethnic groups*) of which respondents could choose one. These were recoded into four different race/ethnic groups: *White (British, Irish, other White)* (1); *Black (Caribbean, African, other Black)* (2); *Asian (Indian, Pakistani, Bangladeshi, Chinese, other Asian)* (3); and *Multiracial/Other (Gypsy/Traveler, Arab, Mixed [White and Caribbean, White and African, White and Asian] and other ethnic group)* (4).

U.S. adults. Race/ethnicity was measured by two questions. First, respondents were asked, “Are you of Hispanic, Latino, or Spanish origin or descent?” (yes/no). Next, respondents were asked, “Which of these groups describes you? Just give me the number or numbers from the card,” with response categories *White; Black or African American; American Indian or Alaska Native; Native Hawaiian, Guamanian or Chamorro, Samoan, other Pacific Islander, Asian, or other*. Respondents could indicate multiple groups. This was recoded into *White* (1); *Native (American Indian, Alaskan Native, Native Hawaiian, Guamanian or Chamorro, Samoan, and other Pacific Islander)*

(2); *Asian* (3); *Black* (4); *Hispanic* (*Hispanic and Hispanic with multiple groups*) (5); and *Multiracial* (non-Hispanic and multiple groups) (6).

U.S. adolescents. Race/ethnicity was also measured with two questions for U.S. adolescents. First, respondents were asked, “Are you Hispanic or Latino?” (yes/no). Next, they were asked, “What is your race? (Select one or more responses),” with response categories *American Indian or Alaska Native*, *Asian*, *Black or African American*, *Native Hawaiian or Other Pacific Islander*, and *White*. A respondent was coded as Hispanic if they answered “yes” on the first question and did not respond to the second question. They were coded as Multiracial if they answered “no” on the first question and provided two or more answers on the second question. This yielded the following response categories, similar to the U.S. adults sample: *White* (1), *Native (American Indian/Alaskan Native and Native Hawaiian and other Pacific Islander)* (2), *Asian* (3), *Black* (4), *Hispanic (Hispanic and Mixed Hispanic)* (5), and *Multiracial (Mixed non-Hispanic)* (6).

Dependent variable: Mental health.

U.K. adults. Mental health was measured with the General Health Questionnaire (GHQ-12; Goldberg, 1978). Participants’ answered 12 questions on mental health problems (e.g., “Have you recently felt constantly under strain?”) using a response scale ranging from 1 (*better than usual*) to 4 (*much less than usual*). Responses were first recoded so that 0 was *better than usual* and 3 was *much less than usual*, then recoded so that higher scores reflected lower distress, and then responses were summed to derive a scale score ranging from 0 to 36 (Cronbach’s $\alpha = 0.90$). The GHQ-12 has been validated in the U.K., among other countries, as a measure to detect psychiatric disorders (McCabe, Thomas, Brazier, & Coleman, 1996; Shevlin & Adamson, 2005).

U.S. adults. Mental health was measured with the Kessler-6 (K6) distress scale (Kessler et al., 2002). Participants indicated how often they experienced symptoms of distress in the past 30 days (e.g., “. . . how often did you feel so sad or depressed that nothing could cheer you up?”) using a rating scale ranging from 1 (*all of the time*) to 5 (*none of the time*). Responses were recoded so that 0 (*all of the time*) to 4 (*none of the time*) and responses were summed to create a scale score ranging from 0 to 24 so that higher scores reflected lower distress (Cronbach’s $\alpha = 0.81$). The K6 has been validated in the U.S., among other countries, as a measure to detect nonspecific psychological distress (Kessler et al., 2002).

U.S. adolescents. Mental health was measured by the item “During the past 12 months, did you ever feel so sad or hopeless almost every day for two weeks or more in a row that you stopped doing some usual activities?” (Brener et al., 2013). Response categories were *no* (0) and *yes* (1). This item approximates the Patient Health Questionnaire-2 (PHQ-2), which has been validated in the U.S. (McCabe et al., 1996).

Covariates. When studying mental health, it is important to take into account certain demographic variables such as gender, age, education, and income as research indicates that these can contribute to differences in mental health (Allen, Balfour, Bell, & Marmot, 2014; Gadalla, 2009). For both U.K. and U.S. adults, gender, age, level of education, and income were therefore used as covariates. For U.S. adolescents, only gender and age were used as covariates because education and income were not measured for both adolescents and their parents.

Analyses

Covariates were controlled for in all analyses to obtain unbiased estimates. Design variables and weights were used to correct in all analyses for the effects of the sampling design. Linear regression analyses were performed for U.K. and U.S. adults, providing an informal comparison of how sexual identity and race/ethnicity are associated with average mental health among U.K. and U.S. adults. In order to improve comparability, mental health was standardized to have $M = 0$ and $SD = 1$ in both samples. Data for U.S. adolescents were analyzed using logistic regression analyses. When groups are compared in logistic regression analysis, different log-odds or odds ratios between groups can reflect differences in effect, but also differences in unobserved heterogeneity (Mood, 2010). Therefore, predicted probabilities were estimated in order to compare the probability of impaired mental health for different sexual identity and race/ethnicity groups. The predicted probabilities were estimated by calculating marginal effects, keeping the covariates at their mean level. Results held when the effects of the covariates were set to their minimum and maximum values.

Due to small cell size, it was not possible to conduct the analyses with categorical variables for both sexual identity and race/ethnicity. Dichotomizing both variables would obstruct our understanding of how sexual identity and race/ethnicity intersect to affect mental health, thereby erasing subgroup differences. Such dichotomization of categorical identity variables is also referred to as the lumping error (Else-Quest & Hyde, 2016). Therefore, to avoid this error but maximize comparison of categories, all analyses were conducted in two ways: (1) with a categorical operationalization of sexual identity (1 = *Heterosexual*, 2 = *Lesbian/gay*, and 3 = *Bisexual*) and a dichotomous race/ethnicity variable (0 = *White* and 1 = *Person of color*) (presented in Model 1 in Tables 2, 3, and 4), and (2) with a dichotomous sexual identity variable (0 = *Heterosexual* and 1 = *Sexual minority*) and a categorical race/ethnicity operationalization (for U.K. adults, 1 = *White*, 2 = *Black*, 3 = *Asian*, and 4 = *Multiracial*; for U.S. adults and adolescents, 1 = *White*, 2 = *Native*, 3 = *Asian*, 4 = *Black*, 5 = *Hispanic*, and 6 = *Multiracial*) (presented in Model 2 in Tables 2, 3, and 4).

Missing Data

Missing data analyses on all three samples suggested that missing data were missing at random. Multiple imputation is a sufficient procedure to take into account this type of missingness (Schafer & Graham, 2002). Furthermore, it could be the case that some of the respondents who replied *prefer not to say* on the sexual identity question in the U.K. adults sample did so in order to hide a stigmatized LGB sexual identity. This would have led to a correlation between sexual identity and missing sexual identity information in that dataset (i.e., “Missing Not at Random”). However, if this were the case, multiple imputation would still be the optimal method for dealing with this missingness (e.g., Pedersen et al., 2017). Twenty-five imputed data sets were created for each sample, which is likely sufficient given the modest proportion of missing data across data sets (see Table 1; Liu & De, 2015).

Table 1
Descriptive Statistics by Sample

Variable	U.K. adults (N = 43,904)				U.S. adults (N = 43,313)				U.S. adolescents (N = 15,122)			
	M	SD	Range	n (% missing)	M	SD	Range	n (% missing)	M	SD	Range	n (% missing)
Mental health	24.91	5.50	0–36	38,731 (11.8%)	19.60	4.71	0–24	43,313 (0.0%)	Yes	30.5		14,966 (1.0%)
Sexual identity	Heterosexual Lesbian/Gay	97.8 1.2		37,485 (14.6%)	Heterosexual Lesbian/Gay	93.8 2.1		42,802 (1.2%)	No	69.5		14,200 (6.1%)
Race/ethnicity	Bisexual	1.0			Bisexual	4.1			Lesbian/Gay	2.3		
	White	86.1		43,648 (0.6%)	White	59.9		43,313 (0.0%)	Bisexual	6.5		14,784 (2.2%)
	Black	3.7			Native	2.0			White	45.0		
	Asian	8.0			Asian	4.6			Native	1.7		
	Multiracial	2.2			Black	12.6			Asian	4.1		
					Hispanic	17.5			Black	11.0		
					Multiracial	3.3			Hispanic	33.4		
Gender	Men	43.9		43,904 (0.0%)	Men	45.6		43,313 (0.0%)	Multiracial	4.8		15,011 (0.7%)
	Women	56.1			Women	54.4			Men	49.7		
	48.72	17.78	18–103	43,997 (0.0%)	18–25 years old	33.4		43,313 (0.0%)	Women	50.3		14,055 (0.4%)
Age					26–34 years old	20.9			14 years old or younger	11.1		
					35–49 years old	25.6			15 years old	24.5		
					50–64 years old	11.8			16 years old	26.0		
					65 or older	8.2			17 years old	24.7		
					No high school diploma	14.3		43,289 (0.1%)	18 years old or older	13.6		
Education	No qualification	14.9		43,784 (0.3%)	High school diploma/GED	27.0						
	Other qualification	10.0			Some college credit, no degree	24.1						
	GCSE	20.1			Associates degree	9.3						
	A level	20.5			College graduate or higher	25.3						
	Other degree	11.7										
	Degree	22.8										
	£0–1,000	37.3		43,904 (0.0%)	Less than \$10,000	31.4		41,796 (3.5%)				
Income	£1,000–2,000	34.8			\$10,000 till \$19,999	20.1						
	£2,000–3,000	15.8			\$20,000 till \$29,999	12.8						
	£3,000–4,000	6.3			\$30,000 till \$39,999	9.4						
	£4,000 or more	5.7			\$40,000 till \$49,999	7.7						
					\$0,000 till \$74,999	9.5						
					\$75,000 or more	9.0						

Note. For categorical variables, percentages are given.

Table 2
Linear Regression of Mental Health by Sexual Identity and Race/Ethnicity Among U.K. Adults

Variable	Model 1		Model 2	
	<i>b</i>	95% CI	<i>b</i>	95% CI
Intercept	-0.39***	[-0.44, -0.33]	-0.39***	[-0.44, -0.34]
Sexual identity binary (Heterosexual = reference)				
Sexual minority			-0.44***	[-0.55, -0.32]
Sexual identity categorical (Heterosexual = reference)				
Lesbian/gay	-0.33***	[-0.46, -0.19]		
Bisexual	-0.59***	[-0.77, -0.41]		
Race/ethnicity binary (White = reference)				
Person of color	-0.01	[-0.05, 0.03]		
Race/ethnicity categorical (White = reference)				
Black			0.04	[-0.03, 0.11]
Asian			-0.02	[-0.08, 0.03]
Multiracial			-0.05	[-0.13, 0.04]
Categorical sexual identity × Binary race/ethnicity				
Lesbian/gay × Person of color	0.05	[-0.35, 0.45]		
Bisexual × Person of color	0.22	[-0.17, 0.61]		
Binary sexual identity × Categorical race/ethnicity				
Sexual minority × Black			-0.26	[-0.69, 0.18]
Sexual minority × Asian			0.29	[-0.09, 0.66]
Sexual minority × Multiracial			0.17	[-0.38, 0.73]
Age	0.00***	[0.00, 0.00]	0.00***	[0.00, 0.00]
Gender	0.19***	[0.17, 0.22]	0.20***	[0.17, 0.22]
Education	0.03***	[0.02, 0.04]	0.03***	[0.02, 0.04]
Income	0.04***	[0.03, 0.05]	0.04***	[0.03, 0.05]

Note. Model 1 uses a categorical sexual identity variable and a dichotomous race ethnicity variable. Model 2 uses a dichotomous sexual identity variable and a categorical race ethnicity variable. CI = confidence interval. * $p < 0.05$. ** $p < 0.01$. *** $p < 0.001$.

Results

Descriptive Statistics

The descriptive statistics of all three samples are reported in Table 1.

U.K. adults. Mental health was skewed to the left, indicating that most respondents had good mental health. Concerning sexual identity, 2.2% of the respondents self-identified as LGB, which is similar to other studies using population-based samples (Gates, 2011). A vast majority of the respondents (86.1%) identified as White.

U.S. adults. Mental health was skewed to the left among U.S. adults too. A total of 6.2% of the respondents identified as LGB, which is somewhat higher than other population estimations (Gates, 2011). Within this sample, 59.9% of the respondents identified as White, making the sample sufficiently racially/ethnically diverse.

U.S. adolescents. In total, 35.0% of the respondents indicated having low mental health. Of all respondents, 8.8% identified as LGB, which is higher than in previous population-based samples (Gates, 2011), although these population-based samples consisted of adults. The sample was racially/ethnically diverse, with 45.0% of respondents identifying as White.

Regression Analyses

U.K. adults linear regression. Focusing on Model 1 in Table 2, lesbian/gay ($b = -0.33$, 95% CI [-0.46, -0.19]) and bisexual people ($b = -0.59$, 95% CI [-0.77, -0.41]) reported poorer

mental health compared to heterosexual people, which supports the first hypothesis. As dependent variables were standardized, this means that lesbian/gay people reported -0.33 *SD* and bisexual people reported -0.59 *SD* lower mental health compared to heterosexual respondents, indicating that the effect for bisexual people is more pronounced. No significant interaction effects with race/ethnicity were found in Models 1 and 2, finding no support for the second hypothesis. Furthermore, we found positive associations of age ($b = 0.00$, 95% CI [0.00, 0.00]), gender ($b = 0.19$, 95% CI [0.17, 0.22]), education ($b = 0.03$, 95% CI [0.02, 0.04]), and income ($b = 0.04$, 95% CI [0.03, 0.05]) with mental health (see Model 1).

U.S. adults linear regression. As expected in hypothesis 1, lesbian/gay ($b = -0.28$, 95% CI [-0.43, -0.14]) and bisexual people ($b = -0.61$, 95% CI [-0.71, -0.50]) had significantly worse mental health compared to heterosexual people (see Model 1, Table 3). Thus, lesbian/gay people reported -0.28 *SD* and bisexual people reported -0.61 *SD* lower mental health compared to heterosexual respondents, indicating that the effect for bisexual people is more pronounced. There was no significant interaction effect between the categorical sexual identity variable and the dichotomous race/ethnicity variable in Model 1, nor was there a significant interaction between the dichotomous sexual identity variable and the categorical race/ethnicity variable in Model 2. Thus, there was no support for the second hypothesis. Furthermore, we found positive associations of age ($b = 0.13$, 95% CI [0.12, 0.14]), gender ($b = 0.08$, 95% CI [0.05, 0.11]), and income ($b = 0.06$, 95% CI [0.05, 0.07]) with mental health (see Model 1).

Table 3
Linear Regression of Mental Health by Sexual Identity and Race/Ethnicity Among U.S. Adults

Variable	Model 1		Model 2	
	<i>b</i>	95% CI	<i>b</i>	95% CI
Intercept	-0.71***	[-0.76, -0.65]	-0.75***	[-0.81, -0.68]
Sexual identity binary (Heterosexual = reference)				
Sexual minority			-0.46***	[-0.55, -0.37]
Sexual identity categorical (Heterosexual = reference)				
Lesbian/gay	-0.28***	[-0.43, -0.14]		
Bisexual	-0.61***	[-0.71, -0.50]		
Race/ethnicity binary (White = reference)				
Person of color	0.14***	[0.11, 0.17]		
Race/ethnicity categorical (White = reference)				
Native			0.00	[-0.10, 0.10]
Asian			0.09**	[0.04, 0.15]
Black			0.10***	[0.06, 0.14]
Hispanic			0.23***	[0.19, 0.27]
Multiracial			-0.15**	[-0.24, -0.05]
Categorical sexual identity × Binary race/ethnicity				
Lesbian/gay × Person of color	-0.04	[-0.27, 0.19]		
Bisexual × Person of color	0.11	[-0.06, 0.29]		
Binary sexual identity × Categorical race/ethnicity				
Sexual minority × Native			0.05	[-0.41, 0.52]
Sexual minority × Asian			0.11	[-0.13, 0.35]
Sexual minority × Black			0.14	[-0.03, 0.31]
Sexual minority × Hispanic			-0.05	[-0.24, 0.14]
Sexual minority × Multiracial			0.06	[-0.23, 0.36]
Age	0.13***	[0.12, 0.14]	0.13***	[0.12, 0.14]
Gender	0.08***	[0.05, 0.11]	0.08***	[0.06, 0.11]
Education	0.00	[-0.00, 0.01]	0.00	[-0.00, 0.01]
Income	0.06***	[0.05, 0.07]	0.06***	[0.05, 0.07]

Note. Model 1 uses a categorical sexual identity variable and a dichotomous race ethnicity variable. Model 2 uses a dichotomous sexual identity variable and a categorical race ethnicity variable. CI = confidence interval.
 * $p < 0.05$. ** $p < 0.01$. *** $p < 0.001$.

U.S. adolescents logistic regression. Following the first hypothesis, lesbian/gay ($p = .47$, 95% CI [.37, .57]) and bisexual adolescents ($p = .59$, 95% CI [.53, .65]) were significantly more likely than heterosexual adolescents ($p = .26$, 95% CI [.25, .28]) to report impaired mental health (Table 4, Model 1). Again, this effect was most pronounced for bisexual adolescents. Significant interaction effects between the categorical sexual identity variable and the dichotomous race/ethnicity variable were found in Model 1. That is, lesbian/gay adolescents of color ($p = .38$, 95% CI [.25, .51]) were less likely than White lesbian/gay adolescents ($p = .57$, 95% CI [.43, .70]) to report impaired mental health, which is in line with the second hypothesis. Similarly, bisexual adolescents of color ($p = .54$, 95% CI [.46, .61]) were less likely than White bisexual adolescents ($p = .64$, 95% CI [.56, .72]) to report impaired mental health. When the dichotomous sexual identity variable and the categorical race/ethnicity variable were used (see Model 2), it was found that Black sexual minority adolescents ($p = .40$, 95% CI [.29, .51]) were less likely than White sexual minority adolescents ($p = .63$, 95% CI [.56, .71]) to report impaired mental health, in support of the second hypothesis. No other significant differences in impaired mental health were found between White sexual minority adolescents and sexual minority adolescents of color. Of note, adolescents of color ($p = .39$, 95% CI [.34, .45]) were less likely to report impaired mental health compared to White adolescents ($p = .48$, 95% CI [.41, .54]) (See Model 1). When a categorical race/ethnicity variable was used, only Black

($p = .31$, 95% CI [.25, .37]) adolescents were less likely to report impaired mental health than White adolescents ($p = .42$, 95% CI [.38, .47]; see Model 2). Lastly, heterosexual Hispanic ($p = .32$, 95% CI [.19, .35]) and Multiracial ($p = .34$, 95% CI [.30, .39]) adolescents were more likely than White heterosexual adolescents ($p = .24$, 95% CI [.21, .27]) to report impaired mental health (See Model 2).

Discussion

This study aimed to investigate how the association between sexual identity and mental health differs based on race/ethnicity in national representative samples of U.K. adults, U.S. adults, and U.S. adolescents. Following the minority stress (Meyer, 2003) and psychological mediation framework (Hatzenbuehler, 2009), we expected LGB people to report worse mental health than heterosexual people. Furthermore, we hypothesized that the negative association between an LGB identity and mental health is weaker among people of color than among White people. The benefit of analyzing national representative data sets of U.K. adults, U.S. adults and U.S. adolescents is that this enabled us to present side-by-side assessments of the association between sexual identity and race/ethnicity, and mental health among adults in different contexts, as well as in different life phases in the U.S. simultaneously.

Table 4
Predicted Probabilities of Impaired Mental Health by Sexual Identity and Race/Ethnicity Among U.S. Adolescents

Variable	Model 1		Model 2	
	<i>p</i>	95% CI	<i>p</i>	95% CI
Sexual identity binary ^a				
Heterosexual			.28	[.26, .31]
Sexual minority			.56***	[.46, .66]
Sexual identity categorical ^a				
Heterosexual	.26	[.25, .28]		
Lesbian/gay	.47***	[.37, .57]		
Bisexual	.59***	[.53, .65]		
Race/ethnicity binary ^b				
White	.48	[.41, .54]		
Person of color	.39*	[.34, .45]		
Race/ethnicity categorical ^b				
White			.42	[.38, .47]
Native			.57	[.35, .79]
Asian			.35	[.22, .47]
Black			.31***	[.25, .37]
Hispanic			.42	[.37, .47]
Multiracial			.42	[.33, .51]
Categorical sexual identity × Binary race/ethnicity ^c				
Heterosexual and White	.24	[.21, .27]		
Heterosexual and Person of color	.29**	[.26, .31]		
Lesbian/gay and White	.57	[.43, .70]		
Lesbian/gay and Person of color	.38*	[.25, .51]		
Bisexual and White	.64	[.56, .72]		
Bisexual and Person of color	.54*	[.46, .61]		
Binary sexual identity × Categorical race/ethnicity ^d				
Heterosexual and White			.24	[.21, .27]
Sexual minority and White			.63	[.56, .71]
Heterosexual and Native			.36	[.24, .49]
Sexual minority and Native			.75	[.44, .99]
Heterosexual and Asian			.21	[.16, .27]
Sexual minority and Asian			.51	[.25, .76]
Heterosexual and Black			.23	[.20, .26]
Sexual minority and Black			.40***	[.29, .51]
Heterosexual and Hispanic			.32***	[.29, .35]
Sexual minority and Hispanic			.53	[.45, .61]
Heterosexual and Multiracial			.34***	[.30, .39]
Sexual minority and Multiracial			.50	[.34, .67]

Note. Model 1 uses a categorical sexual identity variable and a dichotomous race ethnicity variable. Model 2 uses a dichotomous sexual identity variable and a categorical race ethnicity variable. Age and gender were set at their mean values for these analyses. CI = confidence interval.

^a Reference for the significance test was the heterosexual group. ^b Reference for the significance test was the White group. ^c Within each sexual orientation group, the reference for the significance test was the White group. ^d Within each race/ethnicity group, the reference group for the significance test was White group of the same sexual identity.

* $p < .05$. ** $p < .01$. *** $p < .001$.

As hypothesized, we found that among U.K. adults, U.S. adults, and U.S. adolescents, LGB people reported worse mental health than heterosexual people. The poorest mental health was reported among bisexual people, in line with previous research (e.g., Plöderl & Tremblay, 2015). This might reflect the double stigmatization that bisexual people face from both the heterosexual and the LGB community, commonly referred to as biphobia (Hayfield, 2020). This study was uniquely able to show variation in sexual identity-based disparities in mental health by race/ethnicity for adults in the U.K. and U.S., as well as for adults and adolescents in the U.S., using national representative data.

We also hypothesized that the negative association between LGB identity and mental health is weaker among people of color

than among White people. For U.K. and U.S. adults, we found no support for this hypothesis. In the logistic regression analyses for U.S. adolescents, some support was found for this hypothesis. That is, when a categorical sexual identity variable and a dichotomous race/ethnicity variable were used, we found that lesbian/gay and bisexual adolescents of color were less likely to report an impaired mental health than White lesbian/gay and bisexual adolescents (respectively). Using a categorical race/ethnicity variable showed that only Black sexual minority adolescents were less likely to report impaired mental health compared to White sexual minority adolescents. Thus, for LGB adolescents as a group and for Black U.S. adolescents specifically, support for the second hypothesis was found. That this hypothesis only held for Black sexual minor-

ity adolescents might reflect differences in racial socialization among people of color in the U.S. For example, Black adolescents receive more preparation for bias messages compared to Asian or Latinx Americans (Priest et al., 2014). Future research may empirically test if such racial socialization or preparation for encountering racism explains the difference in mental health between LGB adolescents of color and White LGB adolescents.

Contrasting U.K. and U.S. Adults

Among U.K. and U.S. adults, having a lesbian/gay or bisexual identity was related to worse mental health. Furthermore, despite the different historical and social contexts of people of color in the U.K. and the U.S. (Better, 2008; Vertovec, 2007), no support was found for a weaker association between a LGB identity among people of color than among White LGB people in either country. The fact that similar findings were observed among adults in both countries might be related to age. That is, the health benefits of processes such as ethnic socialization (Hughes et al., 2006) and stress-related growth (Caplan, 1964) could be especially salient during adolescence. In other words, White LGB people could become more resilient to the negative effects of sexual identity-related stigma in adulthood, diminishing the benefits ethnic socialization and stress-related growth provide LGB people of color.

Contrasting U.S. Adolescents and Adults

There were some differences between the results of U.S. adults and adolescents. Among U.S. adults, the negative association between LGB identity and mental health was not weaker among people of color than among White people. Among U.S. adolescents, such an effect was found among lesbian/gay adolescents of color (compared to White lesbian/gay adolescents), among bisexual adolescents of color (compared to White bisexual adolescents), and among Black sexual minority adolescents (compared to White sexual minority adolescents). This aligns with the idea that the health benefits of ethnic socialization (Hughes et al., 2006) and stress-related growth (Caplan, 1964) are especially relevant in adolescence but do not last into adulthood. Studies using longitudinal data can investigate if such health benefits decrease in the transition to young adulthood. Furthermore, the better mental health among Black sexual minority adolescents contradicts expectancies from the greater risk perspective (Moradi et al., 2010). This could potentially indicate that ethnic socialization and stress-related growth mechanisms more strongly affect mental health among Black sexual minority adolescents.

Limitations and Future Directions

One of the strengths of this study is that it analyzed the associations between sexual identity and the intersection with race/ethnicity using three nationally representative samples, enabling us to extrapolate our findings to the general population. The data, however, do not allow for tests of the mechanisms behind studied associations. Therefore, we invite future nationally representative studies to collect data that allow for tests of minority stress, ethnic socialization, and stress-related growth mechanisms.

A limitation of using three different data sets is the different operationalizations of both dependent and independent variables.

With regard to sexual identity, we tried to circumvent this by limiting our analyses to groups that were measured across all studies (i.e., heterosexual, lesbian/gay, and bisexual). This led to the exclusions of the “other,” “don’t know,” and “not sure” categories and inhibited us from studying the previously found health disparities of people who are uncertain about their sexual identity (Bejakovich & Flett, 2018) and people with a different sexual minority identity such as a pansexual identity (Greaves, Sibley, Fraser, & Barlow, 2019). Race/ethnicity was assessed differently across studies as well. Similar categories could be created for the two U.S. samples but not for the U.K. sample. However, this was to be expected because of the different racial/ethnic composition in the U.K. and U.S. (Better, 2008; Vertovec, 2007). Lastly, the measures of mental health were different across all studies. Within the constraints of every data set, we tried to choose the best-suited measures of mental health. There are differences between these measures; for example, the K6 scale used in the U.S. adults sample is better able to detect mood and anxiety disorders than the GHQ-12 scale used in the U.K. adults sample (Furukawa, Kessler, Slade, & Andrews, 2003). Nevertheless, in order to harmonize the operationalization of dependent variables across data sets, the continuous mental health measures in the U.K. and U.S. adult samples were standardized. For U.S. adults and adolescents, different types of statistical analyses were performed, making it harder to contrast associations between these two data sets.

A different limitation of the present study is that because no U.K. adolescent data set measuring constructs of interest was available, only a dataset with U.K. adults was used. Hence, we were not able to study the intersection of sexual identity and race/ethnicity for adults and adolescents between and within two countries. Thus, it cannot be determined if the lack of between-country differences we found for adult respondents would be replicated among samples of adolescents. Furthermore, we do not know whether observed differences between adults and adolescents in the U.S. would correspond with differences between adolescents and adults in the U.K. Related to this issue, national representative data sets from two different countries were used, and therefore generalizing these findings to other countries may not be possible.

Although the current study set out to research the intersection of sexual identity and race/ethnicity on mental health, we were not able to conduct analyses with categorical operationalizations of both sexual identity and race/ethnicity due to small cell sizes. Not being able to dissect the effects of intersecting identities completely is a known drawback of doing intersectional research with quantitative data (Bostwick et al., 2014; Bowleg, 2012) and sometimes referred to as the lumping error (Else-Quest & Hyde, 2016). Data collections focusing on (over)sampling these minority groups could help to overcome this drawback. Future research should focus on further dissecting the effects of intersecting identities, moving beyond omnibus measures of sexual identity and race/ethnicity. Additionally, we were restricted in our racial/ethnic group comparisons. For example, there was no Middle Eastern response category in both U.S. data sets, limiting the knowledge of these groups.

Furthermore, the lower probability of impaired mental health among LGB adolescents of color could also be a result of cultural relativity (Neighbors, Jackson, Campbell, & Williams, 1989), which assumes that there are cultural differences in how White

people and people of color express psychopathology. This could result in overreporting of mental health problems among White people, and underreporting among people of color. Thus, differences in mental health between White LGB people and LGB people of color could also result from differences in reporting psychopathology. This should be a factor future research can consider when studying the intersection of stigma and how it affects mental health.

Findings from this study have implications for mental health professionals who work with LGB people. They should be aware of the larger mental health disparity bisexual people report compared to heterosexual people. Furthermore, they should be aware that White LGB adolescents might lack certain skills to cope with stigma compared with LGB adolescents of color, making them less resilient. Although these effects were found in the U.S., mental health professionals outside of the U.S. should also be aware of how sexual identity and race/ethnicity might intersect in their association with mental health.

In conclusion, the current study uniquely showed that LGB people have a higher risk of impaired mental health compared to heterosexual people in both the U.K. and the U.S. Among U.S. adolescents, LGB adolescents of color reported better mental health compared with White LGB adolescents. More specifically, Black LGB adolescents reported better mental health compared to White LGB adolescents. Together, the present study contributes to a better understanding of the relation between intersecting identities and mental health.

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Received August 29, 2019

Revision received May 21, 2020

Accepted May 28, 2020 ■