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Mostly Heterosexual and Lesbian/Gay Young Adults: Differences in Mental Health and Substance Use and the Role of Minority Stress

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Individuals mostly attracted to other-sex but also to same-sex partners are a distinct and common sexual orientation group with possibly increased levels of health problems. The current study examined whether mostly heterosexual individuals differed in mental health and substance use from lesbian/gay individuals and whether sexual minority risk and protective factors offer an explanation in a sample of 528 Dutch young adults (16 to 25 years old, $M = 21.2$ years). Mostly heterosexual participants reported higher levels of psychological distress, suicidality, drug use, and smoking than lesbian/gay participants and equal levels of binge drinking. They also reported higher levels of internalized negativity to same-sex attractions, less openness to family members and others, less community involvement, and lower numbers of lesbian/gay/bisexual friends. However, bootstrapped mediation analysis showed that the differences in minority stress risk and protective factors did not mediate most of the differences in mental health and substance use with one exception: higher levels of psychological distress were mediated by the higher levels of internalized negativity to same-sex attractions. The limited explanatory power of the minority stress factors combined with the elevated level of problems of mostly heterosexual individuals call for future studies examining other risk and protective factors.

Sexual orientation is the degree to which a person's sexuality is directed toward women, men, or both. Since Kinsey, Pomeroy, and Martin (1948) introduced their 7-point scale to measure sexual orientation, it has been recognized that sexual orientation is not a simple dichotomy between heterosexual and homosexual but rather exists along a continuum. Although researchers generally agree on this premise, most studies use a measure that distinguishes between two (heterosexual and nonheterosexual) or three (heterosexual, bisexual, and lesbian/gay) groups.

Recently, several authors have argued that individuals who indicate they are mostly attracted to other-sex partners but also to same-sex partners may form a distinct sexual orientation group (Li, Pollitt, & Russell, 2015; Savin-Williams & Vrangalova, 2013; Thompson & Morgan, 2008). For example, Thompson and Morgan (2008) conducted a mixed method

study among 388 female college students and concluded that mostly heterosexual women fall between heterosexual and bisexual women in terms of sexual attraction, fantasies, and sexual behaviors in past, present, and future. Savin-Williams and Vrangalova (2013) conducted a systematic review of the empirical evidence to examine whether mostly heterosexual individuals form a distinct sexual orientation group. Based on prevalence rates of arousal, desire, fantasy, attraction, and sexual behavior, qualitative data, experimental studies with genital arousal and pupil dilation/eye-tracking data, they concluded mostly heterosexual individuals constitute a distinct sexual orientation group. For example, from quantitative studies Savin-Williams and Vrangalova reviewed it seemed mostly heterosexual individuals reported that they were more same-sex oriented than heterosexual individuals, but less so than bisexual individuals in terms of attraction and behavior. The reviewed qualitative studies indicated that individuals who categorize themselves as mostly heterosexual experience this as a genuine and accurate sexual orientation category for their feelings, attractions, behaviors, and fantasies.

Mostly heterosexual individuals are a relatively common group. Prevalence estimates based on 18 general population

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samples of women yielded a highest mean estimate of 9.5% (95% CI [9.3%, 9.7%]) and a lowest mean estimate of 7.6% (95% CI [7.4%, 7.8%]) (Savin-Williams & Vrangalova, 2013). In addition, 15 general population samples of men yielded a highest mean prevalence of 4.1% (95% CI [4.0%, 4.3%]) and a lowest of 3.6% (95% CI [3.5%, 3.7%]). Prevalence rates are higher among specific groups, for example, college students and young adults. A developmental trend exists, with mostly heterosexual attractions increasing during teenage years and peaking in the early twenties (Savin-Williams & Vrangalova, 2013). In addition to the developmental trend, there is also a cohort effect for women: Mostly heterosexual women are more often found in recent cohorts. For men, data on cohort effects are lacking.

In 2014, Vrangalova and Savin-Williams published a systematic review of the health differences between mostly heterosexual and heterosexual and between mostly heterosexual and bisexual individuals. They examined 22 data sets and concluded there were many differences between these groups: compared to heterosexual participants, mostly heterosexual participants reported more depression, anxiety, suicidality, and substance use. Their findings were conformed in a recent study by Li and colleagues (2015), which showed that mostly heterosexual participants reported higher levels of concurrent and prospective depression than heterosexual participants. Vrangalova and Savin-Williams' (2014) systematic review also showed that, compared to bisexual individuals, mostly heterosexual individuals reported less mood issues and suicidality, and mostly heterosexual women reported slightly lower substance use than bisexual women (there were no differences for men). However, the results for the comparison between mostly heterosexual and bisexual participants were less consistent, and there was substantial variation in the study results. Subsequently, Li and colleagues (2015) found that mostly heterosexual and bisexual participants reported equal levels of depression.

Studies comparing mostly heterosexual to bisexual or heterosexual individuals are scant, but studies examining differences between mostly heterosexual and lesbian/gay participants are even more rare (see also Li et al., 2015). Few studies exist and, as far as we know, overviews and meta-analyses examining differences between mostly heterosexual and lesbian/gay individuals have not been conducted. In addition, different studies yield different results. Austin and colleagues (2009) compared lesbian and gay adolescents with mostly heterosexual adolescents on purging and binge eating. They found that gay boys reported these behaviors more often than mostly heterosexual boys, but no differences were found for girls. Marshal and colleagues (2013) analyzed a sample of adolescents and concluded that mostly heterosexual and gay/lesbian youth were similar in terms of suicidality but that mostly heterosexual youth reported higher levels of depression. In another paper, Marshal et al. (2013) also concluded that mostly heterosexual youth reported higher levels of symptoms of depression than lesbian/gay youth. Talley, Sher, Steinley, Wood, and Littlefield (2012)

looked at first-year college students and found that mostly heterosexual women reported higher negative alcohol-related consequences than lesbian/bisexual women, but the same was not true for men. Li and colleagues (2015) recently concluded that mostly heterosexual and lesbian/gay participants reported equal levels of concurrent depression, but mostly heterosexual participants reported higher levels of prospective depression.

The question put forward by the studies that reported health differences between mostly heterosexual and other groups is this: How can these differences be explained? A potential explanation could lie in differences in general health risk and protective factors between both groups. Vrangalova and Savin-Williams (2014) reported several studies that examined factors related to the differences by adjusting the comparison of mostly heterosexual versus heterosexual/bisexual for possible risk factors. They concluded that even though some risk factors (such as abuse, sensation seeking, family factors, and social support) attenuate the differences in health outcomes, the differences nevertheless remained significant in the vast majority of the studies.

To the best of our knowledge, a limited number of studies have examined explanations for health differences between mostly heterosexual and lesbian/gay individuals. On one hand, the same general risk factors that explain part of the difference between heterosexual and mostly heterosexual individuals such as abuse, sensation seeking, family factors, and social support (see Vrangalova & Savin-Williams, 2014) could play a role. Li and colleagues (2015) showed that the differences were not related to differences in gender nonconformity. On the other hand, mostly heterosexual and lesbian/gay individuals might differ because of differences in the degree of minority stress risk and protective factors. The current article explores the second line of reasoning.

Meyer's (1995, 2003) minority stress model explains that lesbian, gay, and bisexual (LGB) individuals encounter several unique minority stressors in addition to the stressors experienced by both heterosexual and LGB individuals. These unique LGB stressors have a negative impact on the health of LGB individuals. Meyer identified five factors: experiencing discrimination and victimization, expecting to be victimized or discriminated, concealment of a sexual minority orientation, internalizing homonegativity (i.e., the internalization of society's negative attitude toward same-sex sexuality), and the lack of an LGB network or contact with similar others. Although these factors could all be defined as risk factors, several factors can also be defined as protective factors. For example, openness about sexual orientation can enhance well-being, as can contact with other LGB individuals. The explanatory power of minority stress risk and protective factors has received support in the empirical literature (for examples, see Friedman, Marshal, Stall, Cheong, & Wright, 2008; Hatzenbuehler, 2009; Meyer, 1995, 2003; Sheets & Mohr, 2009; Silverschanz, Cortina, Konik, & Magley, 2008; Swim, Johnston, & Pearson, 2009).

Vrangalova and Savin-Williams (2014) doubted whether the minority stress model was relevant for mostly heterosexual individuals, because they are viewed by others as heterosexual rather than sexual minorities, they mostly have partners of the other sex, and they might not actively participate in the LGB community. This invisibility and non-identification as a sexual minority may protect mostly heterosexual individuals against negative reactions. However, for the other minority stress risk and protective factors, a strong LGB identity and behavioral repertoire is not necessary.

Thompson and Morgan (2008) argued that mostly heterosexual individuals are less open about their attractions and hold a less positive attitude toward their own orientation, since they have a less strong core identity regarding their attractions. Internalized negativity toward same-sex attractions, openness, and community involvement could operate independently of whether one identifies as a sexual minority, possibly making these risk and protective factors relevant for mostly heterosexual individuals. Mostly heterosexual individuals may experience a negative attitude toward their own same-sex attractions, even if these attractions are less strong than their other-sex attractions, not acted upon, unlabeled, or nonfundamental to their identity. They may also not be open about these attractions (Li et al., 2015), which may have a negative impact on their health. Also, even if the LGB community seems less relevant to these individuals, the lack of protective ties with others who experience same-sex attractions can increase their health problems. These factors—internalized negativity toward same-sex attractions, lack of openness, and the lack of an LGB network—are theorized in the minority stress model to be related to health problems (Meyer, 2003). Hence, the minority stress model risk factor of internalized negativity and the protective factors of openness and having an LGB network might be suitable candidates for explaining the increased health problems of mostly heterosexual individuals compared to lesbian/gay individuals.

In summary, mostly heterosexual individuals are a distinct sexual orientation group and seem to report relatively high levels of health problems compared to heterosexual and bisexual individuals. Much less is known about their position in comparison to lesbian/gay individuals in terms of health problems and minority stress. Using data from a Dutch survey among mostly heterosexual and lesbian/gay young adults, we aimed to answer the following research questions:

- RQ1.** Do mostly heterosexual participants differ in mental health (psychological distress and suicidality) and substance use (smoking, alcohol use, and drug use) from lesbian/gay participants—and if so, what differences can be found?
- RQ2.** Do mostly heterosexual participants differ in minority stress risk (internalized negativity to same-sex attractions) and protective factors (openness and LGB

network) from lesbian/gay participants—and if so, what differences can be found?

- RQ3.** Can differences in experiences of minority stress risk and protective factors explain any differences in health between mostly heterosexual and lesbian/gay participants?

Method

Participants

In total, 580 mostly heterosexual ($n = 427$) or lesbian/gay ($n = 153$) participants completed the survey ($n_{\text{men}} = 186$, 32.1%; $n_{\text{women}} = 394$, 67.9%). Participants' age ranged between 16 and 25 ($M = 21.2$, $SD = 2.7$). Half of the participants (53.2%) had a higher and 13.0% had a lower education level. Most of the participants were not religious (74.2%); 21.1% was Catholic. In all, 8% were born outside of the Netherlands. Compared to the general population of young adults in the Netherlands, our sample contained more women and more people of Dutch origin (Central Bureau voor de Statistiek, 2013).

Table 1 shows the differences in sociodemographics between mostly heterosexual and lesbian/gay participants; there were no differences between mostly heterosexual and lesbian/gay participants with regard to the importance of religion, age, or ethnicity. Mostly heterosexual participants were more often female and had a higher education than lesbian/gay participants.

Procedure

Participants were recruited from a commercial online panel sample between December 2 and December 15, 2013. The online panel comprised 13,749 individuals between 16 and 25 years of age. They received an e-mail inviting them to complete a survey about their lives, their environment, their experiences, their health, and their sexual orientation. They were also informed about the time it would take to complete the survey, the compensation they would receive (a small monetary reward in the form of a gift certificate or donation to charity), and a guarantee of their anonymity and confidentiality. After the information on the study, as a form of obtaining consent, they could start with the online questionnaire if they wished to join the study or they could indicate that they did not wish to join the survey based on the information they received. The questionnaire was completed online in a protected environment and could not be accessed without a unique link.

Of the 13,749 individuals approached, 4,917 did not respond (35.8%), 200 refused to participate (1.5%), 289 stopped completing the questionnaire before they had answered at least 90% of the questions (2.1%), 68 e-mails bounced back (0.5%), and 222 individuals (1.6%) tried to

Table 1. *Demographics of the Sample (N = 580)*

Demographics	Mostly Heterosexual (<i>n</i> = 427)	Lesbian/Gay (<i>n</i> = 153)	<i>F</i> / <i>X</i> ²	<i>df</i>	<i>p</i>
Male gender, % (<i>n</i>)	23.4 (100)	56.2 (86)	55.59	1	< .001
Age, <i>M</i> (<i>SD</i>)	21.2 (2.8)	21.1 (2.7)	0.06	1, 578	.815
Education % (<i>n</i>)			11.06	2	.004
Lower	10.4 (44)	20.4 (31)			
Middle	33.6 (143)	34.2 (52)			
Higher	56.0 (238)	45.4 (69)			
Religion, % (<i>n</i>) ^a					
None	72.9 (310)	77.8 (119)			
Christian	22.4 (95)	17.6 (27)			
Islamic	0.7 (3)	2.0 (3)			
Other	4.0 (17)	2.6 (4)			
Importance of religion, <i>M</i> (<i>SD</i>) ^b	1.6 (1.1)	1.5 (1.0)	2.38	1, 578	.123
Dutch ethnicity, % (<i>n</i>)	92.7 (395)	90.1 (137)	1.03	1	.311

^aDue to the low levels of minimum expected count for religion, differences between the type of religion between mostly heterosexual and lesbian/gay participants could not be examined.

^b1 = *Not important at all*; 5 = *Very important*.

complete the survey after the deadline had passed. The final response rate was 58.6% (*N* = 8,053).

The first question was a question on the attractions of the participants, which we used as a measure of their sexual orientation: "To whom do you feel attracted? (1 = only to other-sex partners; 2 = mostly to other-sex partners, but sometimes to same-sex partners; 3 = to same-sex and other-sex partners equally; 4 = mostly to same-sex partners, but sometimes to other-sex partners; 5 = only to same-sex partners; 6 = neither to same-sex nor to other-sex partners; 7 = I don't know)." ¹ The answers were recoded into a variable indicating the empirically derived sexual orientation of the participants: mostly heterosexual (answer 2, *n* = 427) or gay/lesbian (answer 5, *n* = 153). Heterosexual participants (answer 1) were excluded from the current study (*n* = 7,213), as were bisexual participants (*n* = 131), individuals who felt attracted to neither men nor women (*n* = 41), and those who indicated not knowing to whom they felt attracted (*n* = 88).

The questionnaire took about 15 minutes to complete for the lesbian/gay participants and 11 minutes for mostly heterosexual participants (the mostly heterosexual group received fewer questions). The study was monitored by an internal review committee of the Netherlands Institute for Social Research and an external expert who provided approval for the research proposal, methods, and report.

¹ To enhance the clarity of the question, the wording was tailored to the natal sex of the participants. Women received a version of this question which was framed as: "1 = to men only; 2 = mostly to men, but sometimes to women," etc. For men, it was reversed.

Measurements

Mental Health.

Psychological Distress. Psychological distress was assessed by a Dutch version of the Mental Health Inventory-5 (MHI-5) (Ware & Kosinski, 2001). It measured the frequency of five feelings of distress during the preceding four weeks on a 6-point scale (1 = *All the time*; 6 = *Never*). Examples of items were "very nervous," "down and sad," or "calm." The negative items were scored in reverse, and mean scores were calculated. A higher score is indicative of more distress (Cronbach's alpha = .86).

Suicidality. Suicidality was measured by a single item: whether participants ever thought about ending their lives (1 = *Never*; 5 = *Very often*). The Dutch item was self-constructed and based on the items from the Youth Risk Behavior Surveys. With this item the mean score was calculated, with higher mean scores indicating more frequent thoughts about suicide.

Substance Use.

Alcohol Use. Alcohol use was assessed by one question on the average number of drinks consumed on a single occasion during the weekend (1 = *None*; 9 = *More than 10*). A dichotomous measure was created indicating whether participants were binge drinking during the weekend (i.e., five or more alcohol consumptions in one occasion, 0 = *No*; 1 = *Yes*). The item and coding were taken from the Dutch study Health Behaviour of School-Aged Children (HBSC) (de Looze et al., 2014).

Smoking. Smoking was measured with a single item assessing how often participants smoked (1 = *I don't smoke*; 2 = *Less than once a week*; 3 = *At least once a week, but not every day*; 4 = *Every day*). The answers were recoded into a dichotomous measure indicating whether participants were daily smokers (0 = *No*; 1 = *Yes*). The item and coding were

taken from the Dutch study Health Behaviour of School-Aged Children (HBSC) (de Looze et al., 2014).

Drug Use. Drug use was assessed by six self-constructed items on whether participants had ever consumed any of the following six drugs: marijuana, amphetamines, GHB, MDMA (ecstasy), mushrooms, and cocaine (1 = *Yes*; 2 = *No*; 3 = *Do not want to say*). This selection was based on the drugs most frequently used by Dutch youth. A scale score was constructed by counting all positive answers to usage (min = 0; max = 6). Higher scores reflected more drugs used.

Minority Stress Risk Factor.

Internalized Negativity. Internalized negativity was measured by a shortened Dutch version of the Internalized Homonegativity Inventory of Mayfield (2001). Participants completed five questions on a 5-point scale (1 = *Totally agree*; 5 = *Totally disagree*). For example, “I am ashamed that I (also) have feelings for men/women” or “I like it that I am (also) attracted to men/women.”² Positive items were scored in reverse, and mean scores were calculated with higher mean scores indicating more internalized negativity about same-sex attractions (Cronbach’s alpha = .75).

Minority Stress Protective Factors.

Openness. Openness about sexual orientation was measured by two self-constructed subscales: openness to family and openness to others. Openness to family consisted of four items assessing whether participants’ mother, father, brother(s), and sister(s) knew that they (also) had same-sex attractions (1 = *Yes*; 2 = *No*; 3 = *Don’t know*; 4 = *Don’t have [anymore]*). The scale was constructed by adding the number of family members who knew about the participants’ attractions (min = 0; max = 4). Openness to others was examined by four items about whether classmates/fellow students, colleagues, heterosexual friends, and teammates knew that they (also) had same-sex attractions (1 = *None*; 5 = *[Almost] everyone*; 6 = *Don’t have/not applicable*; the last answer was recoded as a missing value). Mean scores were calculated for those participants who did not have more than two missing values. For both subscales, higher mean scores indicated that more individuals were aware of their same-sex attractions (Cronbach’s alpha = .93).

LGB Community Involvement. LGB community involvement was assessed by four items assessing the degree to which participants used several community venues during the past 12 months (e.g., LGB website or LGB bar or party) (1 = *Never*; 5 = *Often*). Items were taken from Baiocco, D’Alessio, and Laghi (2010) and Johns et al. (2013) and adjusted for the younger age of our sample and the Dutch context. Mean scores across the items were

calculated with higher scores indicating more LGB community involvement (Cronbach’s alpha = .70).

LGB Friends. LGB friends were assessed by a single self-constructed item on the number of LGB friends the participants had (1 = *None*; 5 = *10 or more*). Mean scores were calculated with higher score indicating more LGB friends.

Sociodemographics. All analyses were corrected for possible confounding influences of gender and education since both sexual orientation groups differed on these aspects (see Participants section). Gender was available from the background information of the online panel. Level of education was constructed based on three items assessing whether participants were currently still following education, their highest level of completed education (in case they were not following any education at the moment), or their current level of education (in case they were still in school, college, or university) (1 = *Lower educational level*; 2 = *Middle educational level*; 3 = *Higher educational level*).³

Analyses

For the descriptive analyses in which we examined the intercorrelations of the studied variables, partial Pearson *r* correlations were computed with biological sex and education as control variables. To measure the differences between mostly heterosexual and lesbian/gay participants on psychological distress, substance use, internalized negativity to same-sex attractions, openness (family and others), LGB community involvement and number of LGB friends, different sets of analyses of covariance (ANCOVAs) were computed using biological sex and education as control variables. The variables smoking and binge drinking were categorical variables; hence, we used logistic regression analyses—with biological sex and education as controlling variables—to examine whether mostly heterosexual and lesbian/gay participants differed on these two variables.

To examine the mediation effect of minority risk (internalized homophobia) and minority protective factors (openness to family and others, LGB community involvement and number of LGB friends) on the relation between sexual attraction (mostly heterosexual versus lesbian/gay) and mental health and substance use, a bootstrapped mediation through the Process macro as developed by Hayes and colleagues (Hayes, 2012; Preacher & Hayes, 2008) was used. Bootstrapping involves repeatedly (in our case, 10,000 times) randomly sampling cases from the existing complete data set.

²Female participants received a version with “women” and male participants with “men.”

³Dutch levels of education cannot be directly compared to international levels of education. Clarifying examples are that lower educational level includes participants who had primary school only, middle educational level includes participants who had vocational level education, and higher educational participants are bachelor’s or master’s students or those who have completed such a degree.

For each random sample, we computed the mediation model by multiregression analysis (MRA). Across these 10,000 bootstrap samples, we derived an approximation of the mediation model as our final model. In the bootstrapped mediation, we included only the variables that were significantly related and in which the association was in the expected direction. In the bootstrapped mediation analyses sex and education were entered as controlling variables. We used a 95% CI in the analysis. An assumed mediator variable is significant when the obtained CI does not contain the value 0 (Hayes, 2013).

Results

Descriptive Analyses

Descriptive statistics, including means and standard deviations and the partial Pearson *r* correlations for the studied variables on mental health (psychological distress and suicidality), substance use (binge drinking, smoking, and drug use), and risk and protective factors, are shown in Table 2. The results (which were controlled for sex and education differences) showed that the psychological

distress and substance use variables were significantly inter-correlated, and this was also the case for the minority risk and protective variables. Furthermore, the outcome revealed that individuals who reported higher levels of internalized negativity to same-sex attractions and lower scores on openness to family and others showed more psychological distress, and that individuals who reported higher numbers of LGB friends also reported thinking about suicide more often, and were more likely to smoke or binge drink.

Mostly Heterosexual versus Lesbian/Gay Participants: Mental Health and Substance Use

ANCOVAs controlling for sex and education differences showed that mostly heterosexual participants had higher scores on psychological distress, suicidality, and drug use than lesbian/gay participants (see Table 3). Logistic regression analyses showed an association between sexual orientation and smoking, which indicated that mostly heterosexual participants smoked more often than lesbian/gay participants. There was no significant association between sexual orientation and binge drinking (see Table 3).

Table 2. Descriptive Statistics (Means and Standard Deviations for Interval Variables Psychological Distress, Suicidality, Drug Use, Internalized Negativity to Same-Sex Attractions, Openness to Family and Others, LGB Community Involvement, LGB Friends and Intercorrelations, Valid Percentages and n for Dichotomous Variables Binge Drinking and Smoking) and Intercorrelations ^a

	<i>M (SD)/% (n)</i>	1.	2.	3.	4.	5.	6.	7.	8.	9.
Mental health										
1. Psychological distress ^b	2.72 (0.87)	—								
2. Suicidality ^c	1.72 (0.97)	.47***	—							
Substance use										
3. Binge drinking ^d	23.3% (135)	.02***	-.02	—						
4. Smoking ^e	32.8% (190)	.11***	.09*	— ¹	—					
5. Drug use ^f	0.71 (1.60)	.09***	.12**	.30***	.39***	—				
Minority stress risk factor										
6. Internalized negativity ^g	2.06 (0.71)	.21***	-.02	-.03	-.05	.06	—			
Minority stress protective factors										
7. Openness to family ^h	1.06 (1.49)	-.12**	-.01	.03	-.02	.02	-.39***	—		
8. Openness to others ⁱ	2.03 (1.42)	-.10**	-.02	.01	.05	.06	-.44***	.44***	—	
9. LGB community involvement ^j	1.34 (0.58)	.07	.04	.05	.08	.04	-.17***	.51***	-.17***	—
10. LGB friends ^k	2.60 (1.04)	-.02	.10*	-.07	.09*	.10*	-.28***	.33***	-.28***	.42***

^aMeans and correlations are controlled for biological sex and education.

^b1 = *Never*; 6 = *All the time*.

^c1 = *Never*; 5 = *Very often*.

^d0 = *No*; 1 = *Yes*.

^e0 = *No*; 1 = *Yes*.

^f0 = *Used none of the mentioned types of drugs*; 6 = *Used six types of drugs*.

^g1 = *Totally disagree*; 5 = *Totally agree*; higher score reflects higher level of internalized negativity.

^hNumber of family members who do know about the participants' attraction (min = 0; max = 4).

ⁱ1 = *None*; 5 = *(Almost) everyone*.

^j1 = *Never*; 5 = *Often*.

^k1 = *No LGB friends*; 5 = *10 or more LGB friends*.

^lBinge drinking and smoking were both dichotomous variables that do not allow for the computation of partial correlations. The association between binge drinking and smoking was examined using LRA, controlled for sex and education differences. The model was significant, $\chi^2(3, 577) = 49.53, p < .0001$, even as the unique contribution of smoking to the binge-drinking model, Wald = 32.46, $df = 1, p = < .0001$, AOR = 3.39.

* $p < .05$; ** $p < .001$; *** $p < .0001$.

Table 3. ANCOVA/LRA for Mental Health, Substance Use, and Minority Stress Risk/Protective Factors for Mostly Heterosexual and Lesbian/Gay Participants

Factors	Mostly Heterosexual (n = 427)		Lesbian/Gay (n = 153)		F/AOR	df	p	Eta ²
	M/%	SD/n	M/%	SD/n				
Mental health								
Psychological distress	2.80	0.88	2.55	0.82	6.15	1, 573	.013	0.01
Suicidality	1.81	1.02	1.47	0.76	08.02	1, 560	.005	0.01
Substance use								
Binge drinking	24.6%	105	19.6	30	.79	1	.056	0.00
Smoking	34.7%	148	27.5	42	.76	1	.013	0.01
Drug use	0.82	1.25	0.42	0.78	11.20	1, 573	.001	0.02
Minority stress risk factor								
Internalized negativity	2.14	0.69	1.58	0.73	42.07	1, 573	< .0001	0.06
Minority stress protective factors								
Openness to family	0.54	1.12	2.50	1.43	253.31	1, 573	< .0001	0.31
Openness to others	1.49	0.87	3.58	1.54	376.96	1, 553	< .0001	0.40
LGB community involvement	1.15	0.32	1.86	0.80	200.50	1, 573	< .0001	0.26
LGB friends	2.47	0.92	2.98	1.25	36.97	1, 573	< .0001	0.06

Note. ANCOVA/LRA were controlled for gender and education. For the range of the scales, see Table 2.

Mostly Heterosexual versus Lesbian/Gay Participants: Minority Risk and Protective Factors

ANCOVAs (controlled for sex and education differences) showed significant differences between mostly heterosexual and lesbian/gay participants on minority stress risk and protective factors (see Table 3). In general, mostly heterosexual participants reported higher levels of minority stress factors and lower levels of minority protective factors than lesbian/gay participants. Mostly heterosexual participants reported higher levels of internalized negativity to same-sex attractions, were less open to family members and others, were less involved in the LGB community, and had fewer LGB friends.

Mediation of Minority Risk and Protective Factors on Differences in Psychological Well-Being

Bootstrapping mediation analysis with sex and education entered as controlling variables was used to assess whether the differences between mostly heterosexual and lesbian/gay

participants on psychological distress was mediated by internalized negativity to same-sex attractions, openness to family and/or openness to other people. This proposed mediation was the only mediation that met our inclusion criteria for a bootstrapping mediation (see analyses section): (a) mostly heterosexual individuals showed significantly higher scores on psychological distress, (b) mostly heterosexual individuals reported higher scores on internalized negativity and lower scores on openness to family and others, and (c) higher scores on internalized negativity and lower scores on openness to family and others were associated with higher levels of psychological distress.

The results of the mediation analysis confirmed that internalized negativity mediated the differences between mostly heterosexual and LGB participants on psychological distress ($B = -.06$, $SE = .02$, Bootstrap 95% $CI = -.09, -.03$). No significant mediations were found for openness to family ($B = -.06$, $SE = .03$, Bootstrap 95% $CI = -.14, .00$) and openness to other people ($B = .04$, $SE = .04$, Bootstrap 95% $CI = -.05, .14$). The mediation effect of internalized negativity was in the expected direction (see Figure 1). Mostly

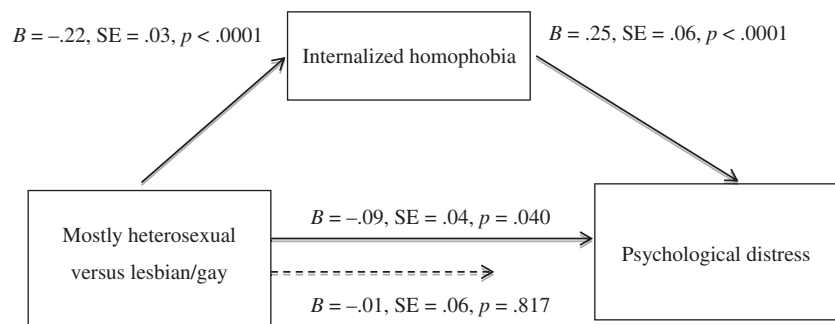


Figure 1. Mediation analyses for internalized homophobia, mostly heterosexual versus LGB individuals, and psychological distress.

heterosexual participants showed higher levels of internalized negativity to same-sex attractions, and this predicted more psychological distress. As the difference between mostly heterosexual and lesbian/gay participants on psychological distress did not remain significant in the bootstrapping analyses, internalized negativity was a full mediator.

Discussion

Mostly heterosexual individuals form a distinct and relatively common sexual minority group (Savin-Williams & Vrangalova, 2013). Previous studies showed that mostly heterosexual individuals reported higher levels of problems than their heterosexual and bisexual peers (Li et al., 2015; Vrangalova & Savin-Williams, 2014). However, much less is known about their position compared to lesbian/gay individuals. It is also unknown whether sexual minority stress risk and protective factors offer a useful framework for explaining possible health differences. The current study set out to examine these questions among Dutch young adults. Results showed that mostly heterosexual participants reported higher levels of psychological distress, suicidality, drug use, and smoking than lesbian/gay participants. The groups did not present any differences in binge drinking. Mostly heterosexual individuals also reported higher levels of minority risk factors and lower levels of minority protective factors. They reported higher levels of internalized negativity to same-sex attractions, were less open to family members and others, were less involved in the LGB community, and reported fewer LGB friends. Nevertheless, ANCOVAs, logistic regression analyses (LRAs), and bootstrapped mediation analyses showed that the differences in minority stress risk and protective factors did not mediate the differences in mental health and substance use. There was one exception: The higher levels of psychological distress among mostly heterosexual compared to lesbian/gay participants were mediated by their higher levels of internalized negativity to same-sex attractions.

The mediational effect of internalized negativity to same-sex attractions on psychological distress is in line with other studies showing the negative consequences of internalized homonegativity for the health of LGB individuals (for a meta-analysis, see Newcomb & Mustanski, 2010). Having a negative attitude toward same-sex attractions can lead to depressive thoughts and a negative self-image. Levels of internalized negativity to same-sex attractions may be especially high during the stage of coming out and are an important issue for young people. As sexual minority youth may not have had personal same-sex experiences and networks yet, their evaluation of their attractions is mainly based on attitudes and stereotypes that exist in society. Since mostly heterosexual individuals mainly behave heterosexually (i.e., have partners from the other sex, are seen by others as heterosexual, do not join the LGB community) their evaluation of their own same-sex attractions is possibly only based on society's view of

same-sex sexuality, which may lead to relatively high levels of negative internalized attitudes to same-sex attractions. Due to the negative impact of these attitudes on psychological distress, the high levels of negative attitudes may also explain the elevated levels of psychological distress.

Although the mediator effect of internalized negativity may not be surprising, the lack of explanatory power of (the absence of) openness and LGB networks is somewhat surprising as lower levels of openness are related to higher levels of mental health problems in the minority stress model (Meyer, 1995, 2003) and in various empirical studies (e.g., Baiocco et al., 2010; Bos, Sandfort, de Bruyn, & Hakvoort, 2008). Since mostly heterosexual individuals reported lower levels of openness and higher levels of mental health problems, a (partial) mediation was expected. As it turned out, lower levels of openness did not explain higher levels of mental health problems of mostly heterosexual individuals. An explanation for these results could be that same-sex attractions are less important for the identity of mostly heterosexual individuals. For lesbian and gay individuals, same-sex attractions are possibly more important for their identity, which could explain the negative impact of not disclosing this aspect of themselves to others. As same-sex attractions are potentially less relevant for the identities of mostly heterosexual individuals, a lack of openness to family or others has no negative impact on their health.

In the minority stress model, having an LGB network and LGB friends is also theorized to have a protective influence against health problems (Meyer, 1995, 2003). Nevertheless, even though mostly heterosexual individuals reported lower levels of community involvement and less LGB friends and higher levels of mental health problems and drug use, no relationships were found between mental health or drug use and LGB community involvement. There were relationships between the number of LGB friends and drug use and suicidality, but these were in the opposite direction: more LGB friends were related to more drug use and higher levels of suicidality. Although this does not conform to the minority stress model, several other studies also pointed out that an LGB network can also increase levels of problems (Baiocco et al. 2010; Holloway et al., 2012). An explanation for this could be that, among LGB individuals, levels of drug use and suicidality are higher than among heterosexual individuals (e.g., Marshal, Friedman, Stall, & Thompson, 2009; Plöderl et al., 2013) and that drug use and mental health problems can spread through social networks (Rosenquist, Fowler, & Christakis, 2011). Also, different social norms and customs may be found in LGB networks compared to heterosexual networks. Therefore, if mostly heterosexual individuals report more LGB friends, the chances that they have friends who use drugs or experience mental health problems may increase and this, in turn, may increase the likelihood of them having such behaviors and experiences.

An additional rationale for the lack of (partial) mediation power of LGB networks could be that the level of LGB community involvement and friends was measured. LGB community involvement is seen as a protective factor as contact with similar others is beneficial for the health of social minorities (Meyer, 1995, 2003). However, LGB community members and LGB friends are not similar others for mostly heterosexual individuals. They are mostly heterosexual, not LGB. Even though there is a common aspect of same-sex attractions, the experiences and behaviors of mostly heterosexual individuals and LGB individuals are not the same. Hence, the protective power of LGB networks may not apply to them. It is recommended that future studies include measurements of the number of friends or acquaintances with same-sex experiences to examine whether contact with those similar others does protect mostly heterosexual individuals against health problems.

The current study showed that mostly heterosexual individuals report higher levels of mental health problems and drug use compared to LGB individuals, and that minority stress risk and protective factors—even if higher levels of risk and lower levels of protective factors are reported—offer little explanation. As the minority stress model does not offer satisfactory explanations, it becomes even more important to examine other factors. Possible candidates could be factors that also partly explain the differences between mostly heterosexual and bisexual or heterosexual individuals such as personality characteristics, sensation seeking, family factors, social support, and abuse experiences (Vrangalova & Savin-Williams, 2014). In addition, future studies could develop and test minority stress measures that are more suitable for mostly heterosexual individuals. Other aspects and other concepts that could be relevant for the health of mostly heterosexual individuals should be taken into account. Furthermore, it is important to gain more detailed and in-depth information on the sexual orientation of the participants. The study of Thompson and Morgan (2008) showed that there are many reasons why mostly heterosexual individuals consider themselves mostly heterosexual. People may consider themselves mostly heterosexual because they do not believe in strict separations between various sexual orientations, because they like to experiment, because of a single same-sex experience or sexual fantasies, because they do not yet know whether they are bisexual or heterosexual, and so on. Different motivations for reporting a mostly heterosexual attraction pattern may yield different results concerning the level of encountered problems and associated factors.

Limitations

Next to the limitations related to the measurements in the study mentioned above and the need for specific

mostly heterosexual measures, the current study had several additional limitations. The measurement of openness was limited, since we could not adjust for the situation in which participants did not have a mother or father, or if the sibling was still too young (to be told). The study used an empirically derived measure of sexual orientation based on attraction. Although there is an overlap between the various dimensions of sexual orientation (e.g., attraction, self-identification or sexual behavior; for examples, see Hayes et al., 2012; Wells, McGee, & Beautrais, 2011), other measures might yield different results (Hegna & Rossow, 2007; Marshal et al., 2008). Furthermore, the study used an online panel to recruit participants. Though this is a strength in the sense that the sample is not biased by community-involvement (Kuyper, Fernee, & Keuzenkamp, 2015), it is a limitation since online panels are not a valid representation of the general population (American Association for Public Opinion Research, 2010; Yeager et al., 2011). The data were cross-sectional, so no causal inferences can be made. Although the minority stress model hypothesizes that internalized negativity to same-sex attractions leads to higher levels of mental health problems, it is also possible that feeling down and depressed amplifies negative attitudes toward having same-sex attractions. All analyses controlled for the differences in sex and education, which were found between mostly heterosexual and lesbian/gay participants. It would have been preferable to conduct separate analyses for men and women and other background characteristics, but the relatively small sample size did not allow for reliable separate analyses. Finally, readers should be aware that the study was conducted in the Netherlands, which was a relatively tolerant country for LGB individuals (Kuyper, Iedema, & Keuzenkamp, 2013). Results may be different in other countries.

Conclusions

Mostly heterosexual individuals constitute a fairly large portion of the general population, and they report elevated levels of health problems when compared to heterosexual, bisexual, and lesbian/gay participants. Even though current knowledge on the factors explaining these elevated levels is limited, it is important to be aware, as clinicians and social workers, that not only do clearly defined sexual minorities run elevated risks, these risks also apply to mostly heterosexual individuals. In addition, the current study once again stresses the importance of remaining alert to nuanced differences in subgroups within the sexual minority population in studies—not only because this enhances understanding of specific problems and needs but also to gain a more detailed appreciation of the problems and factors at work in other sexual minority subgroups.

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