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**Childhood Gender Nonconformity and Sexual Orientation Disparities in Depressive
Symptoms: The Role of Parental Attitudes**

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Abstract

Purpose: This study tested whether sexual orientation disparities in depressive symptoms are partially explained by recalled childhood gender nonconformity, and whether the proportion of this association explained by childhood gender nonconformity is moderated by recalled parental attitudes toward childhood gender nonconformity.

Methods: A convenience sample of young adults was recruited from two Chinese online survey platforms (272 heterosexual males, 272 bisexual males, 272 gay males, 272 heterosexual females, 272 bisexual females, and 272 lesbian females). Both mediation and moderated mediation models were conducted.

Results: For both sexes, bisexual and gay/lesbian individuals reported significantly higher levels of depressive symptoms than heterosexual individuals, with total effects (standardized path coefficients) ranging from 0.25 to 0.38, all $ps < .01$. These sexual orientation disparities in depressive symptoms were partially explained by childhood gender nonconformity, with indirect effects ranging from 0.08 to 0.17, all $ps < .001$. The effect of childhood gender nonconformity on depressive symptoms was significantly moderated by parental attitudes. The mediating effect of childhood gender nonconformity on sexual orientation disparities in depressive symptoms was strongest at the more negative levels (one standard deviation above the mean) of parental attitudes and weakest at more tolerant levels (one standard deviation below the mean) of parental attitudes.

Conclusions: Childhood gender nonconformity may be a partial contributor to sexual orientation disparities in depressive symptoms, and this indirect effect may be moderated by parental attitudes toward childhood gender nonconformity, with the indirect effect decreasing when parental attitudes moving from negative toward more tolerated.

Introduction

Gender nonconformity is defined as the extent to which an individual is atypical with respect to societal gender norms or expectations (e.g., when boys and **men** are relatively feminine, and girls and **women** are relatively masculine).¹ On average, lesbian, gay, and bisexual (LGB) individuals display greater childhood gender nonconformity than heterosexual individuals.¹⁻³ This finding is robustly found in both retrospective and prospective designs.¹⁻⁴ Longitudinal research has also found that girls displayed less gender nonconformity from ages two to five years old but the change rates in gender nonconformity from ages two to five years old among bisexual and lesbian girls were lower than that in heterosexual girls, and bisexual and gay boys became more gender nonconforming from ages two to five years old than heterosexual boys.^{3,4}

Childhood gender nonconformity may have important implications for sexual orientation disparities in psychopathology. Elevated childhood gender nonconformity displayed by LGB individuals compared to heterosexual individuals may increase their risk of experiencing parental maltreatment in childhood,^{5,6} and other forms of prejudice and discrimination from others,^{7,8} which in turn is associated with increased risk of poorer mental health in early adulthood via general psychological (e.g., emotional dysregulation), sexual minority-related (e.g., concealment), and/or biological processes (e.g., dysfunction of stress responses).⁹⁻¹¹ This may be because childhood gender nonconformity acts as a potential behavioral forecast of later LGB identity, for reasons of its strong developmental correlation with sexual orientation, and so attracts stigma, victimization, and negative evaluations from others in the social and developmental (e.g., familial) environment.^{3,6} Indeed, prior research has found that childhood gender nonconformity may partially explain sexual orientation disparities in some mental health outcomes.⁵

Although some studies have found that elevated childhood gender nonconformity was associated with increased risk of poorer mental health outcomes, regardless of sexual orientation,^{12,13} others have found no such association.^{14,15} Accordingly, the association between childhood gender nonconformity and psychopathology may be moderated by other potential moderators, such as attitudes toward childhood gender nonconformity.

One study has found that the association between gender nonconformity and self-esteem was moderated by gender equality as a measure of nation-level societal expectations regarding gender role norms (strongest in countries with the lowest gender equality but weakest in countries with the highest level of gender equality).¹⁶ Childhood gender nonconformity displayed by girls is more tolerated by family members than in boys.¹⁷ Consequently, the magnitude of the association between childhood gender nonconformity and psychopathology was found to be larger in **males** than that in **females**.¹⁸

Studies have also found that father acceptance and parental gender-stereotypical attitudes moderated the association between childhood gender nonconformity and psychopathology.^{19,20} Thus, the mediating effect of childhood gender nonconformity on the association between sexual orientation **and** psychopathology may be moderated by attitudes toward childhood gender nonconformity, especially parental attitudes (gender-liberal or tolerant versus more gender-stereotypical attitudes). Empirically, this suggests that we may expect the path from childhood gender nonconformity to psychopathology to be weaker in magnitude when parental attitudes toward childhood gender nonconformity is positive (more tolerant in their gender-stereotypical attitudes) rather than negative (less tolerant in their gender-stereotypical attitudes).

Gender norms or expectations in China are influenced by the traditional Confucian philosophy (e.g., **men** are not encouraged to express their more tender emotions, and **women** are expected to be subordinate to **men**).²¹ China also performs below average in gender

equality based on *Global Gender Gap Index*, a national-level gender equality index measured via four dimensions (e.g., economic participation).²² To better understand the association between gender nonconformity, sexual orientation, and depressive symptoms in China, here, we test sexual orientation disparities in depressive symptoms, whether this association is partially explained by recalled childhood gender nonconformity, and whether the proportion of this association explained by recalled childhood gender nonconformity is moderated by recalled parental attitudes toward childhood gender nonconformity in a convenience sample from China.

We hypothesized that LGB individuals would report higher levels of depressive symptoms than heterosexual individuals, and that this association would be partially explained by recalled childhood gender nonconformity. The proportion of the association between sexual orientation and depressive symptoms explained by recalled childhood gender nonconformity was also hypothesized to be larger when parents endorsed negative attitudes toward childhood gender nonconformity compared to when parents endorsed positive attitudes toward childhood gender nonconformity.

Materials and Methods

Participants

A convenience sample was recruited from the sample pools of registers in early adulthood (between ages 18 and 26 years old) on two Chinese online survey platforms, Credamo and Wenjuanxing, which are reliable data collection platforms and similar to the Qualtrics Online Sample.²³ Data were collected from November 2022 to December 2022. To ensure response quality, registers with a historical adoption rate (the number of a register's adopted questionnaires divided by the number of questionnaires a register answered in Credamo) lower than 80% were not permitted to answer the questionnaire and multiple replies from the same IP address were also not permitted.

Based on power simulation,²⁴ 272 individuals for each group (heterosexual **males**, bisexual **males**, **gay males**, heterosexual **females**, bisexual **females**, and **lesbian females**) were needed to reach a statistically significant interaction between childhood gender nonconformity and parental attitudes on depressive symptoms ($p < .05$) at a statistical power of .8 when the mediating effect was assumed to be medium. Accordingly, a total of 1632 individuals (272 for each group) were recruited, ranging from 18 to 26 years old ($Mean = 20.95$, standard deviation [SD] = 1.54), among whom 629 (38.54%) reported being a single-child (without siblings) and 1550 (94.98%) reported at least a college education.

Ethical approval for this study was obtained from the Institutional Review Board at Sichuan University, and informed consent was obtained from all participants. Each participant was paid 10 Chinese Yuan for their time.

Measures

Sex. Sex assigned at birth was measured via one item “What sex were you assigned at birth: male or female”. Gender identity was not assessed. Thus, “**male**” and “**female**” refer to their sex assigned at birth.

Sexual orientation. Sexual orientation was measured via one item pertaining to sexual attraction: “To which sex did you feel sexually attracted” on a 7-point Kinsey-like scale ranging from 0 = *exclusively opposite* to 6 = *exclusively same sex*. Participants who chose 0 or 1 were coded as heterosexual, those who chose 2, 3, or 4 were coded as bisexual, and those who chose 5 or 6 as **gay/lesbian**.

Recalled childhood gender nonconformity. Recalled childhood gender nonconformity displayed before the age of 12 was measured via the Childhood Gender Nonconformity Scale.¹ It includes seven items showing large sexual orientation differences in childhood sex-typed behaviors (e.g., activity preference and cross-dressing) for each sex,² with each being rated on a 7-point scale ranging from 1 = *strongly disagree* to 7 = *strongly agree*. Example

items are “As a child I was called a sissy by my peers” for **males** and “As a child I was called a tomboy by my peers” for **females**. The Chinese version of scale used was translated from the original English one and back-translated. The Cronbach’s α for this scale was .87 and .85 in our sample for **males** and **females**, respectively. The total score of the seven items for each sex was used and a higher score indicated greater childhood gender nonconformity.

Recalled parental gender-typical child-rearing attitudes. Recalled parental gender-typical child-rearing attitudes was measured via the Child-Rearing Sex Role Attitude scale,²⁵ which has been validated in previous research.²⁶ It includes 19 items covering recalled parents’ attitudes and beliefs regarding gender-typical behaviors (e.g., activity preference and toys) displayed before the age of 12, with each being rated on a 5-point scale ranging from 1 = *strongly disagree* to 5 = *strongly agree*. An example item is “Parents believed that only boys should be permitted to play competitive sports”. The Chinese version of scale used was translated from the original English one and back-translated. The Cronbach’s α for this scale was .80 in our sample. The total score of the 19 items was used and a higher score indicated stronger gender-stereotypical attitudes about child-rearing (less gender-liberal parental attitudes or less tolerance to gender nonconformity).

Depressive symptoms. Depressive symptoms was measured via the Chinese version of the Short Mood and Feelings Questionnaire (SMFQ), which has good reliability and validity (the Cronbach’s α for this scale was .86 in our sample).²⁷ The SMFQ includes 13 items covering depressive symptoms experienced in past two weeks, with each being rated on a 3-point scale ranging from 0 = *not true* to 2 = *true*. An example item is “I felt lonely”. The total score of 13 items was used and a higher score indicated higher levels of depressive symptoms.

Demographic information. The following demographic information of participants, including age, education (junior high school education or less, senior high school education, a college education, or postgraduate education), being a single-child (yes or no) were collected

Statistical analysis

Missing data. All analyses were performed in Mplus 8.8. Parental attitudes, as an exogenous variable (always as an independent variable in structural equation modelling), had 3.74% missing information, which was handled using mentioning variances of parental attitudes in the MODEL command in mediation and moderated mediation analysis, with their distributional assumptions being made using maximum likelihood estimation. No substantial difference in estimates was found between analyses using maximum likelihood estimation and complete-cases to handle missing in parental attitude (Supplementary Table S1).

Mediation and moderated mediation analysis. In order to test whether recalled childhood gender nonconformity acted as a mediator of the association between sexual orientation and depressive symptoms (see Fig. 1 for the hypothesized model), structural equation modelling was used. Maximum likelihood estimation was used. This method fits the data using linear regression for childhood gender nonconformity and depressive symptoms. The 95% bias-corrected confidence interval (CI) was estimated using bootstrapping method (2000 bootstrap samples), which is robust to non-normality and model misfit.²⁸ Standardized total effect, indirect effect, direct effect, and 95% bias-corrected CI were reported.

In order to test whether the mediating effect of recalled childhood gender nonconformity on the association between sexual orientation and depressive symptoms was moderated by recalled parental attitudes toward childhood gender nonconformity (moderated mediation; see Fig. 1 for the hypothesized model), structural equation modelling was used. Childhood gender nonconformity and parental attitudes were centered at the mean to facilitate the interpretation of the interaction. The moderated mediation effect is considered as statistically significant if the index of moderated mediation is statistically significantly different from zero.²⁹ If a significant moderated mediation effect is detected, the conditional indirect effects where parental attitudes were set at the low (1 SD below the mean), medium (at the mean),

and high (1 SD above the mean) levels are examined. Again, maximum likelihood estimation was used and bootstrapping method (2000 bootstrap samples) was used to estimate the 95% bias-corrected CI.

Analyses were stratified by sex since prior research has found that the association between childhood gender nonconformity and psychopathology was moderated by sex.¹⁸

Results

Mediating effects of recalled childhood gender nonconformity

Descriptive statistics for depressive symptoms, childhood gender nonconformity, and parental attitudes stratified by sexual orientation and sex are shown in Supplementary Table S2. The mediation models had acceptable model fit statistics (Table 1). The standardized path coefficients are shown in Fig. 2.

For both sexes, **LGB** individuals reported significantly higher levels of depressive symptoms than heterosexual individuals, with total effects (standardized path coefficients) ranging from 0.25 to 0.38, all $ps < .01$. Those associations were weakened but remained statistically significant (except for bisexual **males**) when childhood gender nonconformity was controlled for, with direct effects ranging from 0.16 to 0.21, all $ps < .05$. The increased levels of depressive symptoms reported by **LGB** individuals, compared to heterosexual individuals, were partially explained by greater childhood gender nonconformity displayed by **LGB** individuals, with indirect effects ranging from 0.08 to 0.17, all $ps < .001$. The degree of mediation by childhood gender nonconformity was 57.1% and 44.7% for bisexual and **gay males**, respectively. For **females**, the corresponding figures were 26.7% and 36.0%, respectively.

For both sexes, the magnitudes of the total effects, indirect effects, and direct effects among comparisons between bisexual and heterosexual individuals were comparable to those comparisons between **gay/lesbian** and heterosexual individuals (Table 1).

Moderating effects of recalled parental attitudes

The moderated mediation models had acceptable model fit statistics (Table 2). The standardized path coefficients are shown in Fig. 3. The effect of childhood gender nonconformity on depressive symptoms was significantly moderated by parental attitudes, $\beta = 0.17$, 95% CI = (0.11, 0.23), $p < .001$ and $\beta = 0.17$, 95% CI = (0.11, 0.24), $p < .001$ for **males** and **females**, respectively (see Fig. 4 for the interaction between childhood gender nonconformity and parental attitudes on depressive symptoms).

The mediating effect of childhood gender nonconformity on sexual orientation disparities in depressive symptoms was significantly moderated by parental attitudes, the index of moderated mediation = 0.007, 95% CI = (0.004, 0.012), $p < .001$, the index of moderated mediation = 0.008, 95% CI = (0.004, 0.012), $p < .001$, the index of moderated mediation = 0.008, 95% CI = (0.005, 0.013), $p < .001$, and the index of moderated mediation = 0.009, 95% CI = (0.005, 0.014), $p < .001$ for bisexual **males**, **gay males**, bisexual **females**, and **lesbian females**, respectively.

The mediating effect (indirect effect) of childhood gender nonconformity on sexual orientation disparities in depressive symptoms was **significant** at low (more tolerant), medium, and high (more negative) levels of **gender-typical** parental attitudes. However, this was not statistically significant for bisexual and **lesbian females** at low levels of **gender-typical** parental attitudes. The mediating effect of childhood gender nonconformity on sexual orientation disparities in depressive symptoms was strongest at the high levels of **gender-typical** parental attitudes, followed by at the medium levels of **gender-typical** parental attitudes, and weakest at low levels of **gender-typical** parental attitudes.

For both sexes, the magnitudes of the conditional total effects, indirect effects, and direct effects among comparisons between bisexual and heterosexual individuals were comparable to those comparisons between **gay/lesbian** and heterosexual individuals (Table 2).

Discussion

For both sexes, LGB individuals reported significantly higher levels of depressive symptoms than heterosexual individuals, which is consistent with prior research.³⁰ Recalled childhood gender nonconformity partially explained higher levels of depressive symptoms reported by LGB individuals compared to heterosexual individuals. The degree of mediation by childhood gender nonconformity was around 50% and 30% for **males** and **females**, respectively, which is a large portion of the primary association between sexual orientation and depressive symptoms.

Greater childhood gender nonconformity displayed by LGB individuals compared to heterosexual individuals may increase their risk of experiencing parental maltreatment^{5,6} and other forms of prejudice and discrimination from others,^{7,8} which in turn is associated with increased risk of higher levels of depressive symptoms via general psychological, sexual minority-related, and/or biological processes.^{9,11} Consistent with prior findings that childhood gender nonconformity displayed by girls is more tolerated by family members than boys,¹⁷ we found that the magnitude of the association between childhood gender nonconformity and depressive symptoms was larger in **males** than that in **females**.

We also found that the mediating effect of childhood gender nonconformity on the association between sexual orientation and depressive symptoms was moderated by recalled parental attitudes toward childhood gender nonconformity. The mediating effect of childhood gender nonconformity decreased with an increase in more tolerant parental attitudes toward childhood gender nonconformity. Compared to negative parental attitudes toward gender nonconformity, more tolerant parental attitudes toward gender nonconformity may be associated with greater parental support,³¹ less parental maltreatment,³¹ and lower levels of internalized homophobia,¹² which may buffer the negative effect of greater childhood gender nonconformity on depressive symptoms.

We also found that sexual orientation disparities in depressive symptoms were not entirely accounted for by childhood gender nonconformity. Thus, other mechanisms may also account for the sexual orientation disparities in depressive symptoms. Consistent with minority stress theory, one alternative explanation is that sexual orientation-based discrimination or victimization (which is different from victimization targeting gender nonconformity³²) may increase the risk of higher depressive symptoms in LGB individuals compared to heterosexual individuals.⁹⁻¹¹ LGB youths also report higher levels of neuroticism than heterosexual youths, which, in turn, may be associated with higher depressive symptoms^{33,34} via group-specific processes related to sexual minority status (e.g., internalized homophobia) and general psychological processes (e.g., more maladaptive emotional regulation strategies).^{34,35} Other process may involve the shared familial factors relevant to both sexual orientation and depressive symptoms as common cause confounders.³⁶

This study may have implications for parenting practices in countries with more rigid gender-stereotypical attitudes towards child rearing. The results could tentatively suggest that having less rigid gender norms and attitudes, may promote more tolerate parental attitudes and rearing styles towards departures from gender typical behaviors in children. This may in turn influence some mental health outcomes in gender nonconforming children.

Limitations

There were several limitations. This study was based on a convenience sample, which may lead to selection bias and limit the generalizability. However, this is less of concern for our estimates of the relationships between the measured variables within the sample, and our sample was statistically well powered a-priori. The retrospective nature of the measures of childhood gender nonconformity and parental attitudes may lead to recall biases. Some sexual orientation components (e.g., sexual identity labels) were not considered in the measurement of sexual orientation. We cannot confirm whether any transgender individuals

were included in our sample since gender identity was not assessed. The relationships between the measured variables within the sample may be confounded by gender identity since transgender individuals display greater gender nonconformity than cisgender individuals, and may experience unique minority stressors related to stigmatized gender identity.⁸ Finally, the cross-sectional nature of the design does not permit causal references to be made and cannot rule out the possibility of reverse causation.

Conclusions

LGB individuals reported significantly higher levels of depressive symptoms than heterosexual individuals. These sexual orientation disparities in depressive symptoms were partially explained by recalled childhood gender nonconformity. However, the mediating effect of childhood gender nonconformity was moderated by recalled parental attitudes toward childhood gender nonconformity, with the indirect effect decreasing when parental attitudes moving from negative toward more tolerant and positive.

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None.

Authors' Contributions

Y.X. conceptualized the study, conducted data analysis, and wrote the first draft of the article.

All authors helped interpret findings, revised the article, and approved the article before submission.

Author Disclosure Statement

No competing financial interests exist.

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TABLE 1. STANDARDIZED TOTAL, DIRECT, AND INDIRECT EFFECTS FROM MEDIATION ANALYSIS STRATIFIED BY SEX

| Sex | Path | Indirect effect | Direct effect | Total effect |
|--------|--------------------------------------------------------------------------|-------------------------------------------------------------------|--------------------|---------------------|
| Male | | $\chi^2(8) = 13.24, p = .104$; RMSEA = .03, 90% CI = (.00, .05); | | |
| | | CFI = 0.99, TLI = 0.98, SRMR = 0.03 | | |
| | Bisexual → recalled childhood gender nonconformity → depressive symptoms | 0.16***(.011, 0.23) | 0.12 (-0.03, 0.27) | 0.28***(.012, 0.43) |
| | Gay → recalled childhood gender nonconformity → depressive symptoms | 0.17***(.011, 0.23) | 0.21**(.005, 0.35) | 0.38***(.021, 0.53) |
| Female | | $\chi^2(8) = 32.76, p < .001$; RMSEA = .06, 90% CI = (.04, .08); | | |
| | | CFI = 0.89, TLI = 0.82, SRMR = 0.04 | | |
| | Bisexual → recalled childhood gender nonconformity → depressive symptoms | 0.08***(.005, 0.14) | 0.21**(.006, 0.37) | 0.30***(.014, 0.45) |
| | Lesbian → recalled childhood gender nonconformity → depressive symptoms | 0.09***(.005, 0.15) | 0.16*(0.00, 0.31) | 0.25**(.009, 0.40) |

Note. Standardized total effect, indirect effect, direct effect, and their 95% bias-corrected confidence intervals were reported. For sexual orientation, two dummy variables (one for being bisexual and one for being gay/lesbian) were created using heterosexual individuals as the reference groups. For the path from sexual orientation to recalled childhood gender nonconformity, recalled parental attitudes were controlled for. For the path from sexual orientation to depressive symptoms, age, education, being a single-child, and recalled parental attitudes were controlled for.

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

CFI, comparative fit index; CI, confidence interval; RMSEA, root mean squared error of approximation; SRMR, standardized root mean squared residual; TLI, Tucker-Lewis index.

TABLE 2. STANDARDIZED TOTAL, DIRECT, AND INDIRECT EFFECTS FROM MODERATED MEDIATION ANALYSIS
STRATIFIED BY SEX

| Sex | Path | Indirect effect | Direct effect | Total effect |
|---------------|----------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------|--------------------|---------------------|
| Male | | $\chi^2(14) = 49.32, p < .001$; RMSEA = .06, 90% CI = (.04, .07); CFI = 0.92, TLI = 0.91, SRMR = 0.05 | | |
| | Recalled gender-typical parental attitudes low ($M - SD$) | | | |
| | Bisexual → recalled childhood gender nonconformity → depressive symptoms | 0.08**(0.04, 0.14) | 0.10 (-0.05, 0.25) | 0.18*(0.03, 0.33) |
| | Gay → recalled childhood gender nonconformity → depressive symptoms | 0.09**(0.04, 0.15) | 0.20**(0.04, 0.35) | 0.29***(.013, 0.43) |
| | Recalled gender-typical parental attitudes medium (M) | | | |
| | Bisexual → recalled childhood gender nonconformity → depressive symptoms | 0.15***(.010, 0.21) | 0.10 (-0.05, 0.25) | 0.25**(.009, 0.40) |
| | Gay → recalled childhood gender nonconformity → depressive symptoms | 0.15***(.010, 0.22) | 0.20**(0.04, 0.35) | 0.35***(.019, 0.50) |
| | Recalled gender-typical parental attitudes high ($M + SD$) | | | |
| | Bisexual → recalled childhood gender nonconformity → depressive symptoms | 0.22***(.014, 0.30) | 0.10 (-0.05, 0.25) | 0.31***(.015, 0.47) |
| | Gay → recalled childhood gender nonconformity → depressive symptoms | 0.22***(.014, 0.31) | 0.20**(0.04, 0.35) | 0.42***(.025, 0.59) |
| Female | | $\chi^2(14) = 55.73, p < .001$; RMSEA = .06, 90% CI = (.04, .08); CFI = 0.83, TLI = 0.82, SRMR = 0.04 | | |

Recalled *gender-typical* parental attitudes low ($M - SD$)

| | | | |
|--------------------------------------------------------------------------------|--------------------|---------------------|----------------------|
| Bisexual → recalled childhood gender nonconformity → depressive symptoms | 0.01 (-0.04, 0.05) | 0.26** (0.11, 0.42) | 0.27*** (0.12, 0.42) |
| <i>Lesbian</i> → recalled childhood gender nonconformity → depressive symptoms | 0.01 (-0.04, 0.05) | 0.19* (0.04, 0.35) | 0.20* (0.04, 0.35) |

Recalled *gender-typical* parental attitudes medium (M)

| | | | |
|--------------------------------------------------------------------------------|----------------------|---------------------|----------------------|
| Bisexual → recalled childhood gender nonconformity → depressive symptoms | 0.09*** (0.05, 0.14) | 0.26** (0.11, 0.42) | 0.35*** (0.21, 0.51) |
| <i>Lesbian</i> → recalled childhood gender nonconformity → depressive symptoms | 0.10*** (0.06, 0.15) | 0.19* (0.04, 0.35) | 0.29*** (0.13, 0.44) |

Recalled *gender-typical* parental attitudes high ($M + SD$)

| | | | |
|--------------------------------------------------------------------------------|----------------------|---------------------|----------------------|
| Bisexual → recalled childhood gender nonconformity → depressive symptoms | 0.17*** (0.11, 0.26) | 0.26** (0.11, 0.42) | 0.44*** (0.27, 0.60) |
| <i>Lesbian</i> → recalled childhood gender nonconformity → depressive symptoms | 0.19*** (0.12, 0.27) | 0.19* (0.04, 0.35) | 0.38*** (0.21, 0.55) |

Note. The conditional standardized total effect, indirect effect, direct effect, and their 95% bias-corrected confidence intervals where recalled *gender-typical* parental attitudes were set at low (1 SD below the mean), medium (at the mean), and high (1 SD above the mean) levels were reported. For sexual orientation, two dummy variables (one for being bisexual and one for being *gay/lesbian*) were created using heterosexual individuals as the reference groups. For the path from sexual orientation to recalled childhood gender nonconformity, recalled parental attitudes were controlled for. For the path from sexual orientation to depressive symptoms, age, education, being a single-child, and recalled parental attitudes were controlled for.

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

CFI, comparative fit index; CI, confidence interval; M, mean; RMSEA, root mean squared error of approximation; SD, standard deviation; SRMR, standardized root mean squared residual; TLI, Tucker-Lewis index

Figure Legends

Fig.1. Hypothesized models tested in the mediation and moderated mediation analyses

Note. The mediation and moderated mediation models are shown in the top and bottom panel, respectively. Paths where a positive association was predicted are represented with a plus sign (+). For sexual orientation, two dummy variables (one for being bisexual and one for being [gay/lesbian](#)) were created using heterosexual individuals as the reference groups. For the path from sexual orientation to recalled childhood gender nonconformity, recalled parental attitudes were controlled for. For the path from sexual orientation to depressive symptoms, age, education, being a single-child, and recalled parental attitudes were controlled for.

Fig. 2. Standardized path estimates from the mediation analysis stratified by sex

Note. Standardized path coefficients and their 95% bias-corrected confidence intervals were reported (the top panel for [males](#) and the bottom panel for [females](#)). For sexual orientation, two dummy variables (one for being bisexual and one for being [gay/lesbian](#)) were created using heterosexual individuals as the reference groups. β_1 and β_2 represents the differences in recalled childhood gender nonconformity and depressive symptoms between bisexual and heterosexual individuals, and [gay/lesbian](#) and heterosexual individuals, respectively. For the path from sexual orientation to recalled childhood gender nonconformity, recalled parental attitudes were controlled for. For the path from sexual orientation to depressive symptoms, age, education, being a single-child, and recalled parental attitudes were controlled for.

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

CI, confidence interval.

Fig. 3. Standardized path estimates from the moderated mediation analysis stratified by sex

Note. Standardized path coefficients and their 95% bias-corrected confidence intervals were reported (the top panel for **males** and the bottom panel for **females**). For sexual orientation, two dummy variables (one for being bisexual and one for being **gay/lesbian**) were created using heterosexual individuals as the reference groups. β_1 and β_2 represents the differences in recalled childhood gender nonconformity and depressive symptoms between bisexual and heterosexual individuals, and **gay/lesbian** and heterosexual individuals, respectively. For the path from sexual orientation to recalled childhood gender nonconformity, recalled parental attitudes were controlled for. For the path from sexual orientation to depressive symptoms, age, education, being a single-child, and recalled parental attitudes were controlled for.

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

CI, confidence interval.

Fig. 4. The interaction between recalled childhood gender nonconformity and recalled parental attitudes on depressive symptoms stratified by sex.

Note. The conditional effects of recalled childhood gender nonconformity on depressive symptoms (simple slope analysis) where recalled **gender-typical** parental attitudes were set at low (1 SD below the mean), medium (at the mean), and high (1 SD above the mean) levels were reported (the top panel for **males** and the bottom panel for **females**). Age was set to the mean, education was set to be junior high school education or less, being a single-child was set to be yes, and sexual orientation was set to be heterosexual.

SD, standard deviation.

Supplemental Table 1.

Standardized Total, Direct, and Indirect Effects from Moderated Mediation Analysis Using Complete-Cases Stratified by Sex

| Sex | Path | Indirect effect | Direct effect | Total effect |
|-------|------------------------------------------------------------------|------------------------------------------------------------------------------------------------------|--------------------|---------------------|
| Men | | $\chi^2(4) = 19.51, p < .001$; RMSEA = .07, 90%CI = [.04, .10]; CFI = 0.96, TLI = 0.85, SRMR = 0.03 | | |
| | Parental attitudes low ($M - SD$) | | | |
| | Bisexual → childhood gender nonconformity → depressive symptoms | 0.08**[0.04, 0.14] | 0.08 [-0.06, 0.22] | 0.16*[0.01, 0.31] |
| | Homosexual→ childhood gender nonconformity → depressive symptoms | 0.08**[0.04, 0.14] | 0.18*[0.02, 0.33] | 0.26**[0.10, 0.41] |
| | Parental attitudes medium (M) | | | |
| | Bisexual → childhood gender nonconformity → depressive symptoms | 0.14***[0.09, 0.20] | 0.08 [-0.06, 0.22] | 0.22**[0.07, 0.38] |
| | Homosexual→ childhood gender nonconformity → depressive symptoms | 0.15***[0.10, 0.21] | 0.18*[0.02, 0.33] | 0.33***[0.17, 0.48] |
| | Parental attitudes high ($M + SD$) | | | |
| | Bisexual → childhood gender nonconformity → depressive symptoms | 0.21***[0.13, 0.29] | 0.08 [-0.06, 0.22] | 0.29**[0.12, 0.45] |
| | Homosexual→ childhood gender nonconformity → depressive symptoms | 0.22***[0.14, 0.30] | 0.18*[0.02, 0.33] | 0.40***[0.22, 0.56] |
| Women | | $\chi^2(4) = 3.94, p = .414$; RMSEA = .00, 90%CI = [.00, .05]; CFI = 1.00, TLI = 1.00, SRMR = 0.02 | | |
| | Parental attitudes low ($M - SD$) | | | |
| | Bisexual → childhood gender nonconformity → depressive symptoms | 0.01 [-0.03, 0.06] | 0.26**[0.10, 0.42] | 0.29**[0.12, 0.45] |
| | Homosexual→ childhood gender nonconformity → depressive symptoms | 0.02 [-0.03, 0.07] | 0.19*[0.04, 0.36] | 0.22*[0.06, 0.39] |
| | Parental attitudes medium (M) | | | |
| | Bisexual → childhood gender nonconformity → depressive symptoms | 0.09***[0.05, 0.14] | 0.26**[0.10, 0.42] | 0.36***[0.20, 0.53] |

| | | | |
|------------------------------------------------------------------|---------------------|--------------------|---------------------|
| Homosexual→ childhood gender nonconformity → depressive symptoms | 0.10***[0.06, 0.16] | 0.19*[0.04, 0.36] | 0.30**[0.14, 0.48] |
| Parental attitudes high (<i>M</i> + <i>SD</i>) | | | |
| Bisexual → childhood gender nonconformity → depressive symptoms | 0.16***[0.10, 0.25] | 0.26**[0.10, 0.42] | 0.44***[0.27, 0.62] |
| Homosexual→ childhood gender nonconformity → depressive symptoms | 0.18***[0.11, 0.27] | 0.19*[0.04, 0.36] | 0.38***[0.21, 0.57] |

Note. The conditional standardized total effect, indirect effect, direct effect, and their 95% bias-corrected confidence intervals where parental attitudes were set at low (1 SD below the mean), medium (at the mean), and high (1 SD above the mean) levels were reported. For sexual orientation, two dummy variables (one for being bisexual and one for being homosexual) were created using heterosexual individuals as the reference groups. For the path from sexual orientation to childhood gender nonconformity, parental attitudes was controlled for. For the path from sexual orientation to depressive symptoms, age, education, and being a single-child were controlled for.

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

Supplemental Table 2

Descriptive Statistics for Depressive Symptoms, Childhood Gender Nonconformity, and Parental Attitudes Stratified by Sexual Orientation and Sex

| Sex | Variables | Sexual orientation | | | Group contrast (ref = heterosexual) | |
|-------|-------------------------------------------------|--------------------|--------------|--------------|-------------------------------------|------------|
| | | Heterosexual | Bisexual | Homosexual | Bisexual | Homosexual |
| Men | Depressive symptoms | | | | $p < .001$ | $p < .001$ |
| | <i>N</i> | 272 | 272 | 272 | | |
| | <i>M (SD)</i> | 7.96 (4.35) | 9.70 (5.31) | 10.10 (5.53) | | |
| | Childhood gender nonconformity | | | | $p < .001$ | $p < .001$ |
| | <i>N</i> | 272 | 272 | 272 | | |
| | <i>M (SD)</i> | 18.40 (7.57) | 23.39 (9.91) | 23.43 (9.76) | | |
| | Parental gender-typical child-rearing attitudes | | | | $p < .01$ | $p < .01$ |
| | <i>N</i> | 253 | 272 | 272 | | |
| | <i>M (SD)</i> | 55.47 (7.46) | 57.72 (8.93) | 57.48 (9.88) | | |
| Women | Depressive symptoms | | | | $p < .001$ | $p < .001$ |
| | <i>N</i> | 272 | 272 | 272 | | |
| | <i>M (SD)</i> | 8.85 (4.91) | 10.89 (5.55) | 10.71 (5.56) | | |
| | Childhood gender nonconformity | | | | $p < .001$ | $p < .001$ |
| | <i>N</i> | 272 | 272 | 272 | | |
| | <i>M (SD)</i> | 22.01 (8.99) | 26.80 (8.28) | 27.27 (8.89) | | |

| | | | | | |
|-------------------------------------------------|--------------|--------------|---------------|-----------|------------|
| Parental gender-typical child-rearing attitudes | | | | $p < .01$ | $p < .001$ |
| <i>N</i> | 239 | 263 | 272 | | |
| <i>M (SD)</i> | 52.10 (9.15) | 54.89 (9.99) | 55.57 (10.60) | | |

Note. Linear regression was used to test whether bisexual and homosexual youths differed from heterosexual youths in depressive symptoms, childhood gender nonconformity, and parental gender-typical child-rearing attitudes. Heterosexual youths are the reference group. Any potential normality violation for linear regression and missing information for parental gender-typical child-rearing attitudes were handled using full information maximum likelihood estimation with robust standard errors. Analyses were stratified by sex.

