

# Sexual-Orientation Differences in Positive Youth Development: The Mediational Role of Bullying Victimization

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**Objectives.** To examine sexual-orientation differences in positive youth development, and how bullying victimization mediated these differences in a sample of adolescents.

**Methods.** In 2007 to 2008, positive youth development was measured in 1870 adolescents from US schools and after-school programs in 45 states by using the validated Five Cs model of competence, confidence, connection, character, and caring/compassion. Sexual-minority youths (6.8%) reported having same- or both-gender sexual attractions. Nonattracted youths (4.2%) reported having no sexual attractions.

**Results.** Compared with sexual-minority youths, heterosexual and nonattracted youths had lower odds of being a victim of bullying. Heterosexual and nonattracted youths also had higher average scores in competence, confidence, and connection, but these associations between sexual orientation and positive youth development scores were partly attributable to lack of bullying victimization.

**Conclusions.** Designing, implementing, and evaluating interventions that reduce bullying can give sexual-minority youths access to several building blocks of health and well-being. (*Am J Public Health.* 2016;106:691–697. doi:10.2105/AJPH.2015.303005)

**H**ealthy adolescent development has been an important public health issue for decades, and is currently being given renewed and spirited attention by many national organizations. For example, the American Public Health Association, the Office of the Surgeon General, the Office of Adolescent Health, and several other organizations launched a national awareness campaign entitled “Think, Act, Grow” at the American Public Health Association’s Annual Meeting in 2014.<sup>1</sup> The primary mission of this campaign is to promote adolescent health and healthy youth development.<sup>1</sup> In general, campaigns and programs such as “Think, Act, Grow” are built upon a contemporary conceptual framework—positive youth development.

Theoretically, the positive youth development perspective stresses that youths have—and require—universally relevant and culturally specific skills, relationships, and characteristics that assist them in achieving optimal development and health.<sup>2</sup> This

perspective encourages researchers and practitioners to focus on growing healthy adolescents in a holistic manner, instead of targeting a single aspect of their lives (e.g., mental health). Generally, the positive youth development perspective also emphasizes a portion of the World Health Organization’s definition of *health* that is rarely examined—“health is not merely the absence of disease or infirmity.”<sup>3(p1)</sup> Central components of the positive youth development perspective include creating and sustaining a strong developmental foundation, and providing youths with opportunities to thrive.

Empirically, one way that positive youth development has been measured is with the Five Cs model, which emphasizes competence, confidence, connection, character, and caring/compassion as the building blocks of youths’ livelihood and well-being.<sup>2</sup> In this model, *competence* is defined as having a positive view of one’s actions in social, academic, cognitive, and vocational arenas.<sup>2</sup> *Confidence* is an aspect of mental health defined as an internal sense of overall positive self-worth, self-efficacy, and global self-regard, as opposed to domain-specific beliefs.<sup>2</sup> *Connection* includes supportive and positive bonds with peers, family, school, and community.<sup>2</sup> *Character* is defined as having respect for societal and cultural rules, as well as having a sense of morality and integrity. *Caring/compassion* is defined as a sense of sympathy and empathy for others.<sup>2</sup> Higher levels of the Five Cs are associated positively with contributions to society and negatively with myriad health risk behaviors, including cigarette smoking, alcohol use, and early sexual initiation.<sup>2,4,5</sup>

Previous studies have found that sexual-minority youths report worse mental health, lower academic achievement, and less adult support than their heterosexual peers.<sup>6–9</sup> Because these are each facets of the Five Cs, it is likely that sexual-minority youths experience lower positive youth development than heterosexuals, which may help explain the numerous health disparities

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experienced by sexual-minority youths.<sup>10</sup> However, to our knowledge, no study has holistically examined sexual-orientation differences in positive youth development with a validated measure such as the Five Cs model.

Importantly, the positive youth development perspective is founded on the theory of Developmental Contextualism,<sup>11</sup> which emphasizes the relationships between individuals and their environments. This theory states that healthy development is fostered by supportive environments and positive interactions with people in youths' social networks. Substantiating this theory are multiple intervention studies that have evaluated how positive youth development programs focused on creating supportive environments reduce youths' risks for negative health outcomes, including substance use and sexual and reproductive health risks.<sup>12,13</sup>

On the other hand, Developmental Contextualism suggests that unsupportive environments and harmful relationships may hinder positive youth development. For example, violence and victimization have negative impacts on self-esteem and social and academic competencies.<sup>8,14–16</sup> Sexual-minority youths, in particular, have a heightened vulnerability to experiences of violence, including bullying victimization, compared with their heterosexual peers.<sup>14,17,18</sup> Previous studies have shown that the large sexual-orientation disparity in victimization mediates sexual-orientation disparities in academic achievement and aspects of mental health.<sup>8,19</sup> Thus, sexual-orientation disparities in bullying victimization may be a driver of any sexual-orientation differences in positive youth development.

The purpose of this study was to examine 2 primary research questions. First, are there sexual-orientation differences in positive youth development when measured with the Five Cs model? Second, does bullying victimization explain sexual-orientation differences in positive youth development? We used data from a sample of adolescents to investigate these research questions.

## METHODS

The 4-H (head, heart, hands, and health) Study of Positive Youth Development was an 8-year longitudinal study that annually

surveyed adolescents. A primary goal of this study was to examine positive youth development among a sample of demographically diverse youths. Begun in 2002, the 4-H study sampled participants from 57 schools and 4 after-school programs located in 13 US states, purposively selected to attain regional, rural-urban, racial/ethnic, and religious diversity.<sup>2</sup> Census-like sampling was used at each site; that is, every 5th-grade student and his or her parent were offered to enroll at wave 1. This study used a multiple-cohort design, in which new groups of participants were added at every survey wave, because attrition is common in longitudinal studies. Sites were added to rejuvenate the sample every year, and were purposively selected to maintain regional, rural-urban, racial/ethnic, and religious diversity.<sup>5,20</sup> The estimated response rate was 50% across the duration of the study, with response rates of approximately 33% in waves 1 to 3, and much higher in waves 4 to 6 because more 4-H clubs participated and they had better response rates than schools (K. S. Callina, e-mail communication, June 1, 2015). Additional details on study design and sampling procedures can be found elsewhere.<sup>2,20</sup>

In the current investigation, we used data from wave 6 (2007–2008), as this was when sexual orientation was measured. Wave 6 participants were from 27 schools and 77 after-school programs (grade range: 5th grade to high-school graduates) in 45 states.<sup>20</sup> Of the 2466 participants who completed surveys at wave 6, 29.7% had enrolled in waves 1 through 5, and 70.3% were new enrollees. Of all participants enrolled in waves 1 through 5 ( $n = 4016$ ), 18.3% completed surveys at wave 6. Although surveys were largely collected by site coordinators, participants were given options to complete Internet surveys or mail completed surveys directly to the research team. This may have caused sampling bias, which we remedied by controlling for the nonindependence of participants within each site and the method in which the participant responded (i.e., at school, at after-school program, on Internet, or via mail).

## Measures

**Sexual orientation.** Sexual orientation was measured with 2 items assessing sexual attractions: “Are you sexually attracted to

males?” and “Are you sexually attracted to females?” Response options ranged from 1 (“not at all”) to 6 (“very strongly”). On the basis of responses to these questions and participants' gender, we created a sexual orientation variable with 4 categories: participants with opposite-gender attractions only (henceforth referred to as “heterosexuals”), both-gender attractions, same-gender attractions only, and no attractions. Because just 13 participants reported having only same-gender attractions, we collapsed same- and both-gender attractions into a single category (henceforth, “sexual-minority youths”). We removed participants missing data on any sexual attraction items ( $n = 363$ ).

**Covariates.** Gender, race/ethnicity (coded as White, Black, Hispanic, and other), and grade were measured. In multivariable models, we used grade continuously and centered it at 10th grade (the grand median) to provide meaningful intercepts.<sup>21</sup>

**Bullying victimization.** We used the global bullying victimization measure from the Olweus Bully/Victim Questionnaire,<sup>22</sup> which has good construct validity.<sup>23</sup> First, bullying was defined to participants:

A child is being bullied when another child, or a group of children, says or does nasty and unpleasant things to him or her. It is also bullying when a child is teased repeatedly in a way he or she does not like or when he or she is deliberately left out of things. But it is not bullying when two children of about the same strength or power argue or fight. It is also not bullying when teasing is done in a friendly and playful way.

Then participants were asked: “In the past couple of months, how often have you been bullied?” Likert scale response options ranged from 0 (“never”) to 4 (“several times a week”). Per previous research,<sup>23</sup> we dichotomized bullying victimization into 2 categories: nonvictims (those who were bullied less than 2 or 3 times per month); and victims (those who reported being bullied at least 2 or 3 times per month).

**Positive youth development: the Five Cs.** We used the Five Cs Model<sup>2</sup> to measure positive youth development. The model underwent rigorous scale development procedures (e.g., literature review, pilot testing, editing).<sup>2</sup> Previous studies found the Five Cs to be valid and reliable, as the constructs were positively

correlated with each other, loaded onto a single latent factor, were internally consistent, were positively associated with contributions to society, and were negatively associated with risk behaviors.<sup>2,5,20,24</sup>

Table A (available as a supplement to the online version of this article at <http://www.ajph.org>) provides detail about each of the subscales or subitems assessing the Five Cs, including number of items, example items, and Cronbach alphas. Each of the subscales or subitems were adapted from existing measures: Eisenberg Sympathy

Scale,<sup>25</sup> Empathic Concern Subscale of the Interpersonal Reactivity Index,<sup>26</sup> Peer Support Scale,<sup>27</sup> Search Institute's Profile of Student Life—Attitudes and Behaviors Survey,<sup>28</sup> and the Self-Perception Profile for Adolescents.<sup>29</sup> For each subscale, we standardized the response formats to range from 0 to 12 by calculating the proportionate distances from the lowest and highest possible scores and converting this to a score between 0 and 12. For example, we transformed items with response categories that ranged from 1 to 5 such that 1 was changed to 0, 2 became 3, 3

became 6, 4 became 9, and 5 became 12. Further detail about recoding of variables is publicly available elsewhere.<sup>30</sup> Each of the subscales had excellent internal consistency as Cronbach  $\alpha$  ranged from 0.71 to 0.94 (Table A). Finally, we calculated the total score for each of the Five Cs by calculating the average of each constructs' subscales (Table B, available as a supplement to the online version of this article at <http://www.ajph.org>), where each subscale was given equal weight. We converted this number to a 0-to-100 scale by multiplying the overall

**TABLE 1—Characteristics of the Total Sample and by Sexual Orientation (n = 1870): The 4-H Positive Youth Development Study, United States, 2007–2008**

Characteristic	Total Sample (n = 1870), No. (%) or Mean $\pm$ SD	Heterosexual (n = 1664), No. (%) or Mean $\pm$ SD	Sexual Minority (n = 127), No. (%) or Mean $\pm$ SD	No Attraction (n = 79), No. (%) or Mean $\pm$ SD
<b>Gender</b>				
Female	1202 (64.3)	1042 (62.6)	92 (72.4) <sup>a,b</sup>	68 (86.1) <sup>c</sup>
Male	668 (35.7)	622 (37.4)	35 (27.6)	11 (13.9)
<b>Grade</b>				
7	40 (2.1)	30 (1.8)	3 (2.4) <sup>a,b</sup>	7 (8.9) <sup>c</sup>
8	203 (10.9)	179 (10.8)	7 (5.5)	17 (21.5)
9	396 (21.2)	358 (21.5)	16 (12.6)	22 (27.8)
10	825 (44.1)	734 (44.1)	66 (52.0)	25 (31.7)
11	281 (15.0)	251 (15.1)	24 (18.9)	6 (7.6)
12	125 (6.7)	112 (6.7)	11 (8.7)	2 (2.5)
<b>Race/ethnicity</b>				
White	1476 (78.9)	1318 (79.2)	92 (72.4)	66 (83.5)
Black	117 (6.3)	105 (6.3)	8 (6.3)	4 (5.1)
Hispanic	119 (6.4)	103 (6.2)	13 (10.2)	3 (3.8)
Other	158 (8.4)	138 (8.3)	14 (11.0)	6 (7.6)
<b>Response method</b>				
After-school program	1163 (62.2)	1040 (62.5)	63 (49.6) <sup>a,b</sup>	60 (75.9)
School	426 (22.8)	379 (22.8)	37 (29.1)	10 (12.7)
Internet	233 (12.5)	206 (12.4)	19 (15.0)	8 (10.1)
Mail	48 (2.6)	39 (2.3)	8 (6.3)	1 (1.3)
<b>Bullying victimization</b>				
No	1630 (87.2)	1465 (88.0)	97 (76.4) <sup>a</sup>	68 (86.1)
Yes	240 (12.8)	199 (12.0)	30 (23.6)	11 (13.9)
Competence	72.6 $\pm$ 16.5	72.9 $\pm$ 16.4	68.0 $\pm$ 17.6 <sup>a,b</sup>	74.6 $\pm$ 16.2
Confidence	66.7 $\pm$ 18.7	67.2 $\pm$ 18.5	59.9 $\pm$ 20.6 <sup>a,b</sup>	68.9 $\pm$ 17.8
Connection	68.1 $\pm$ 14.9	68.4 $\pm$ 14.7	62.7 $\pm$ 15.2 <sup>a,b</sup>	72.2 $\pm$ 14.7 <sup>c</sup>
Character	2.0 $\pm$ 15.4	71.9 $\pm$ 15.3	69.8 $\pm$ 16.2 <sup>b</sup>	79.1 $\pm$ 12.2 <sup>c</sup>
Caring/compassion	74.5 $\pm$ 18.4	74.3 $\pm$ 18.4	74.1 $\pm$ 19.2	78.1 $\pm$ 16.2

Notes. 4-H = head, heart, hands, and health. Heterosexuals reported opposite-gender attractions only. Sexual-minority youths reported both-gender attractions or same-gender attractions only. To derive *P* values, we used the 2-sample *t* test for continuous variables and the  $\chi^2$  test for categorical variables.

<sup>a</sup>*P* < .05 for sexual-minority youths compared with heterosexual youths.

<sup>b</sup>*P* < .05 for sexual-minority youths compared with nonattracted youths.

<sup>c</sup>*P* < .05 for heterosexual youths compared with nonattracted youths.

average by 8.33, as recommended by Lerner.<sup>30</sup>

## Data Analyses

We analyzed cross-sectional data from wave 6 with SAS version 9.4 (SAS Institute, Cary, NC). Overall, 2466 participants completed surveys. We first removed the participants missing data on sexual orientation and the few participants in grade 5 ( $n = 6$ ), grade 6 ( $n = 19$ ), and graduated from high school ( $n = 49$ ). Of the remaining participants, missing data were minimal with the highest being 4.9% for bullying victimization. We conducted complete-case analyses with an analytic sample of 1870 participants.

To bivariately compare sexual-orientation differences, we used the 2-sample  $t$  test for continuous variables and the  $\chi^2$  or Fisher exact test for categorical variables. We then fit multivariable models with generalized estimating equations, accounting for non-independence of participants within each site. We used multivariable logistic regression to examine sexual-orientation differences in bullying victimization, adjusting for gender, grade, race/ethnicity, and response method.

We fit multivariable linear regression models to investigate sexual-orientation differences in the Five Cs with adjustment for gender, grade, race/ethnicity, and response method (see Table C, available as a supplement to the online version of this article at <http://www.ajph.org>, for these models). Next we added bullying victimization to the multivariable linear regression models with the Five Cs as the dependent variables. We followed the rules of mediation by MacKinnon et al.<sup>31</sup> to examine whether bullying victimization explained (i.e., mediated) the relationship between sexual orientation and the Five Cs. We formally tested the mediation relationship by using the PRODCLIN macro,<sup>32</sup> which estimates the 95% confidence interval (CI) for the indirect effect (i.e., the product of the  $\alpha$  and beta coefficients).<sup>32</sup> The  $\alpha$  coefficient was the coefficient for the primary independent variable (i.e., sexual orientation) on the mediating variable (i.e., bullying victimization).<sup>32</sup> The beta coefficient was the coefficient for the mediator on the dependent variable (i.e., the Five Cs), after controlling for the independent variable.<sup>32</sup> If zero was not included in the 95%

CI for the indirect effect (i.e.,  $P < .05$ ), mediation occurred.<sup>32</sup>

In multivariable models, we estimated differences in bullying victimization and the Five Cs between nonattracted and heterosexual youths (by making heterosexual youths the referent). We also explored gender-by-sexual orientation interactions by adding interaction terms to the multivariable models.

## RESULTS

In total, 6.8% of participants ( $n = 127$ ) were sexual-minority youths, and 4.2% ( $n = 79$ ) reported having no attractions. Table 1 shows unadjusted percentages, means, and standard deviations for all variables in the total sample and stratified by sexual orientation (see Table B for gender- and sexual orientation-stratified descriptive statistics). In the adjusted model (Table C), heterosexual (odds ratio [OR] = 0.37; 95% CI = 0.23, 0.59) and nonattracted youths (OR = 0.41; 95% CI = 0.18, 0.91) had lower odds of bullying victimization than sexual-minority youths.

### The Five Cs

**Competence.** Compared with sexual-minority youths, heterosexual and nonattracted youths had significantly higher average competence, with adjustment for race/ethnicity, grade, gender, and response method (Table C). We then added bullying victimization as an independent variable (abbreviated results are in Table 2; full results are in Table C), and bullying victims had lower competence than nonvictims. Finally, bullying victimization significantly mediated the differences in competence between sexual-minority and heterosexual youths (95% CI of mediation effect = 3.30, 11.95), and between sexual-minority and nonattracted youths (95% CI of mediation effect = 0.37, 13.43; Table D, available as a supplement to the online version of this article at <http://www.ajph.org>).<sup>31,32</sup> Sexual-orientation differences in competence (with and without bullying adjustment) are visually depicted in Figure 1.

**Confidence.** Compared with sexual-minority youths, heterosexual and

nonattracted youths had significantly higher average confidence (Table 2 and Table C). The model that included bullying victimization as an independent variable showed that bullying victimization was associated with lower confidence. Bullying victimization significantly mediated the differences in confidence between sexual-minority and heterosexual youths (95% CI of mediation effect = 4.75, 15.65), and between sexual-minority and nonattracted youths (95% CI of mediation effect = 0.68, 17.78; Figure 1; Table D).<sup>31,32</sup>

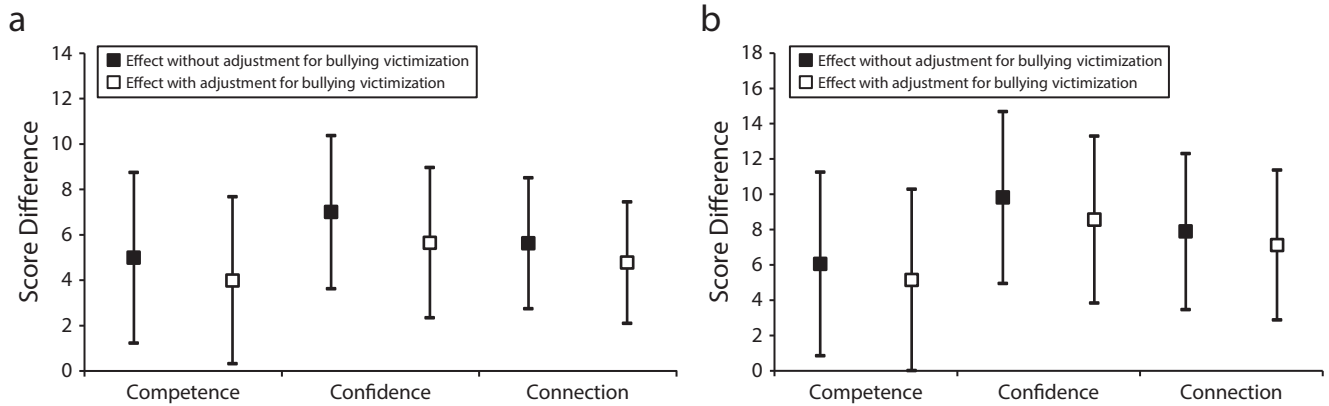
**Connection.** Compared with sexual-minority youths, heterosexual and nonattracted youths had significantly higher average connection (Table 2 and Table C). The model that included bullying victimization as an independent variable showed that bullying victimization was associated with lower connection. Bullying victimization significantly mediated the differences in connection between sexual-minority and heterosexual youths (95% CI of mediation effect = 2.70, 10.30), and between sexual-minority and nonattracted youths (95% CI of mediation effect = 0.26, 11.51; Figure 1 and Table D).<sup>31,32</sup>

**Character.** Compared with sexual-minority youths, nonattracted youths—but not heterosexual youths—had significantly higher average character (Table 2 and Table C). The model that included bullying victimization as an independent variable showed that bullying victimization was not associated with character. Therefore, bullying victimization was not a mediator.<sup>31,32</sup> The 95% CIs of the mediation effects were not significant (Table D).

**Caring/compassion.** There were no sexual-orientation differences in caring/compassion (Table 2 and Table C). The model that included bullying victimization as an independent variable showed that bullying victimization was not associated with caring/compassion. Therefore, bullying victimization was not a mediator.<sup>31,32</sup> The 95% CIs of the mediation effects were not significant (Table D).

### Post Hoc Analyses

Post hoc analyses showed that nonattracted youths had higher average character scores than heterosexuals ( $b = 4.85$ ; 95% CI = 2.32, 7.37), but there were no significant



Note. 4-H = head, heart, hands, and health. Whiskers represent 95% confidence intervals. All models controlled for race/ethnicity, grade, gender, response method, and study design. Heterosexuals reported opposite-gender attractions only. Sexual-minority youths reported both-gender attractions or same-gender attractions only.

**FIGURE 1—Association Between Scores for Competence, Confidence, and Connection Comparing (a) Heterosexual vs Sexual-Minority Youths and (b) Nonattracted vs Sexual-Minority Youths: The 4-H Positive Youth Development Study, United States, 2007–2008**

differences between these groups in the other Five Cs or bullying victimization ( $P > .05$ ; data not shown).

Nearly all gender-by-sexual orientation interactions were nonsignificant (data not shown). However, the differences in connection between sexual-minority and heterosexual youths were significantly larger for female than male youths ( $P = .022$ ); and gender interacted with differences in caring/compassion between nonattracted and sexual-minority youths ( $P = .024$ ), such that caring/compassion was higher for nonattracted male youths than sexual-minority male youths, but similar for nonattracted and sexual-minority female youths.

## DISCUSSION

In this investigation, we used a validated model of positive youth development to

examine differences by sexual orientation in a sample of adolescents. We found that heterosexual and nonattracted youths had higher scores than sexual-minority youths in several—but not all—areas of positive youth development. Heterosexuals had higher competence, confidence, and connection than sexual-minority youths. Our results corroborate previous findings,<sup>6–9</sup> but synthesize them into a single study. Yet, sexual-minority youths were similar to heterosexuals in their levels of character and caring/compassion. On the other hand, nonattracted youths had higher competence, confidence, connection, and character—but not caring/compassion—than sexual-minority youths.

We also found that bullying partially explained several of the sexual-orientation differences in positive youth development. The higher prevalence of bullying among sexual-minority youths mediated the sexual-orientation differences in

competence, which is similar to a previous study concerning poor academic grades.<sup>8</sup> Bullying victimization also mediated the sexual-orientation differences in confidence and connection. Bullying victimization is not the only mechanism that reduces competence, confidence, and connection for sexual-minority youths: other factors—including minority stressors,<sup>33</sup> stigma,<sup>34</sup> and childhood abuse victimization<sup>17</sup>—may also contribute to these differences.

Bullying victimization, however, did not explain differences in character between sexual-minority and nonattracted youths. These findings may be related to differences in developmental or biopsychosocial factors (e.g., puberty development), but there is a gap in the research literature on nonattracted youths. However, establishing one’s sexual orientation is a developmental task in adolescence, and can occur at different ages for different adolescents (e.g., we found that nonattracted female

**TABLE 2—Multivariable Linear Regression Models for the Five Cs: The 4-H Positive Youth Development Study, United States, 2007–2008**

Variable	Competence, b (95% CI)	Confidence, b (95% CI)	Connection, b (95% CI)	Character, b (95% CI)	Caring/Compassion, b (95% CI)
<b>Sexual orientation</b>					
Heterosexual	3.99 (0.32, 7.67)	5.65 (2.34, 8.96)	4.78 (2.10, 7.45)	2.53 (–1.00, 6.06)	1.29 (–1.90, 4.48)
Sexual minority (Ref)					
No attraction	5.15 (0.01, 10.29)	8.57 (3.84, 13.29)	7.13 (2.88, 11.37)	7.41 (3.12, 11.70)	2.05 (–2.90, 7.01)
Bullying victimization	–7.73 (–10.14, –5.31)	–10.33 (–12.88, –7.78)	–6.59 (–8.85, –4.33)	–1.94 (–4.11, 0.23)	–0.72 (–3.16, 1.72)

Note. 4-H = head, heart, hands, and health; CI = confidence interval; Five Cs = competence, confidence, connection, character, and caring/compassion. All models controlled for race/ethnicity, grade, gender, response method, and study design. Heterosexuals reported opposite-gender attractions only. Sexual-minority youths reported both-gender attractions or same-gender attractions only. The sample size was  $n = 1870$ .

adolescents were more likely to be in lower grades). With little research to date on non-attracted adolescents, our investigation partially addresses this knowledge gap.

Our study can directly inform interventions to improve sexual-minority youths' development and well-being. Interventions should focus on building resources and assets. This includes helping parents, schools, and peers build stronger, more accepting and supportive connections with sexual-minority youths. Another way to do this is to reduce violence against sexual-minority youths, especially because bullying victimization is a major driving force in creating sexual-orientation differences in positive youth development, as well as many other areas of health.<sup>10,35</sup> Antibullying policies at schools that enumerate sexual-minority youths as a protected class are necessary, but insufficient.<sup>36</sup> Broadly, school and community environments must become highly accepting and supportive of sexual-minority youths to help foster their positive youth development.

Researchers have been calling for a focus on more positive aspects of sexual-minority lives,<sup>37</sup> and one of these is positive youth development. Previous studies have shown that greater positive youth development is associated with multiple positive health outcomes.<sup>2,4,5</sup> However, previous studies have not examined how positive youth development specifically relates to the health of sexual-minority youths. We hypothesize that greater positive youth development is associated with lower mental health problems and reduced substance use for sexual-minority youths. Should research yield these findings, from a health equity lens, interventions that improve positive youth development will be critical to improve the well-being of sexual-minority youths.

Despite our study being among the first to examine sexual-orientation differences in positive youth development, it is not without limitations. We used items regarding sexual attractions to measure sexual orientation, so results may differ if sexual orientation is measured via sexual identity or behaviors. Although sexual attraction is a developmentally appropriate way to measure sexual orientation for adolescents,<sup>38</sup> adolescents' attractions may change over time,<sup>39</sup> which presents limitations for cross-sectional

study designs like ours. Sexual attraction items were assessed with a 6-point scale with only the extremes of the scale defined (i.e., "not at all" and "very strongly"), and the psychometric properties of these items are unknown.

Moreover, a small number of youths identified as having only same-gender attractions, precluding us from parsing out effects by the 6-point gradient or for both-gender-attracted youths compared with only same-gender-attracted youths; plus, some participants were missing data on sexual attractions. We were unable to assess how participants' sexual attraction responses were affected by social desirability bias; nor could we examine intersections of race/ethnicity with sexual orientation because our study was not powered to do so. We conducted gender-by-sexual orientation interactions post hoc, so these findings must be treated with caution. Future research should test these findings more rigorously with a sample including more nonheterosexual male adolescents.

Although we used data from youths in diverse regions of the United States, our findings may not be generalizable to all youths, especially those not in school or after-school programs. Selection bias is likely present, because attrition rates were high and precise response rates were unknown (K. S. Callina, e-mail communication, June 1, 2015), further limiting our knowledge of generalizability. Although we examined bullying victimization, future studies should also examine the role of childhood abuse victimization and bullying perpetration, because some (if not all) sexual-minority subgroups are at greater risk for these factors.<sup>17,40</sup> Finally, this study was cross-sectional; thus, we cannot assume causality with certainty. However, bullying has been found to mediate other health disparities for sexual-minority youths<sup>8,19</sup>; thus, it likely functions similarly in our study.

Bullying hinders sexual-minority youths' access to the essential building blocks of health and well-being, making it imperative for interventions to explicitly address bullying victimization against sexual-minority youths. Multilevel, multifaceted interventions are necessary: schools should have policies and programs that prevent adolescents from engaging in bullying of sexual-minority youths, and have clear and consistent consequences

for bullying perpetrators; families should be provided with tools to support, protect, and console their children; and communities and government agencies should be competent about the needs of their local sexual-minority youth residents. Together, researchers, practitioners, and communities can develop effective evidence-based programs to reduce bullying of sexual-minority youths. Once a foundation of effective interventions is created, population-level reductions in bullying can be realized. This is an ambitious research agenda, making it necessary for families, schools, communities, and governments to work in concert to reduce the disproportionate bullying of sexual-minority youths and foster environments that allow all youths, regardless of their sexual orientation, the same opportunity to thrive. **AJPH**

## CONTRIBUTORS

R. W. S. Coulter led the study conceptualization and design, data analysis and interpretation, and writing of the article. A. L. Herrick, M. R. Friedman, and R. D. Stall contributed to study conceptualization and design, data interpretation, and writing and editing of the article. All authors approved the final article.

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**Note.** The article's contents are solely the responsibility of the authors.

## HUMAN PARTICIPANT PROTECTION

The 4-H Study of Positive Youth Development and the informed consent process were approved by Tufts University's institutional review board, and the current investigation was deemed exempt by the University of Pittsburgh's institutional review board because it used existing de-identified research data.

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