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Project: “Sexual Orientation and the Risk for Unintended Pregnancy among US Women of Reproductive Age.”

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INTRODUCTION

a. Nature of the research problem

Half of all U.S. pregnancies are unintended – that is, they are mistimed (occurring earlier than desired) or unwanted (not wanted at any time).^{1,2} Unintended pregnancies are considered a public health issue as they increase the risk of various negative health and well-being indicators for women and their children.³⁻¹⁰ Extant studies find that young (<age 20) lesbian and bisexual women are more likely than heterosexual women to experience a pregnancy and to engage in behaviors that increase their risk for unintended pregnancy, yet sexual minority women (SMW) have been virtually ignored in research and policy efforts related to pregnancy intentions and desirability.¹¹⁻¹⁷ This project used nationally-representative data of reproductive-age women to investigate disparities between sexual minority and heterosexual women in the risk of unintended pregnancy (*Paper 1*) and women’s happiness/unhappiness about their pregnancies (*Paper 2*).

b. Brief overview of relevant background literature

A growing consensus has emerged supporting a social constructionist perspective of sexual identity, where: 1) sexual identity formation is viewed as a continual interaction between the individual and her social environment; and 2) contextual cues of stigma and support influence how she thinks about her sexual orientation.¹⁸⁻²³ Specifically, individuals view their sexuality based on a desire to avoid stigma and attract social support.¹⁸⁻²³ Experimental evidence shows that situational cues of support for same-sex sexuality lead people to report more same-sex sexuality, and vice versa.²⁴ Thus, when negative consequences resulting from stigma against SMW are more salient, women with same-sex attractions are more likely to identify as “straight” (i.e., sexual orientation discordance) to avoid negative consequences. Conversely, perceived social support for same-sex sexuality will embolden women with same-sex attractions to identify as non-straight (i.e., sexual orientation concordance). Moreover, Meyer’s (2003) “minority stress” framework posits that sexual minorities are at increased risk for mental and other health problems as a result of dealing with stigma, discrimination, and hostile social environments.²⁹

c. Summary of purpose, scope, and methods of the investigation

Paper 1:

Paper 1 explored whether adult SMW were more likely to experience unintended pregnancies compared with heterosexual women, examined the role of identity-attraction congruence in unintended pregnancy risk, and evaluated possible mediators. Data on pregnancies to women ages 18-44 were drawn from the 2006-2013 National Survey of Family Growth. Weighted logistic regression models estimated the likelihood of reporting an unintended (rather than intended) pregnancy by identity-attraction congruence and the extent to which this association was mediated by sexual experiences with men (i.e., age at first sex, number of sexual partners).

Paper 2:

Paper 2 examined possible disparities in birth happiness between SMW and heterosexual women. Data were drawn from the 2006-2015 National Survey of Family Growth. Weighted linear regression models estimated differences in women’s happiness about births by sexual orientation concordance, controlling for socio-demographics. We also explored whether intention status of the birth and partner characteristics mediated the relationship and if the relationship varied by intention status.

3) Study Design and Methods

a. Brief description of study design

This study used secondary data.

b. Population studied

Heterosexual and sexual minority women of childbearing age.

c. Sample selection, recruitment and enrollment

Data were drawn from the 2006 – 2015 National Survey of Family Growth (NSFG), a large, nationally-representative sample of Americans, ages 15-44.²⁵ This is considered to be the best data source on fertility and family-related behaviors in the U.S. The data are cross-sectional, with new samples taken every year starting in 2006.

d. Instruments used

Paper 1:

Unintended Pregnancy. Questions in the NSFG for ascertaining intention status were coded using the standard approach.^{26,27} Pregnancies were classified as “intended” if they came at the “right time” or later than the woman wanted; they are classified as “unintended” if the pregnancy came “too soon” or if the woman wanted no future pregnancy. Pregnancies were the unit of observation in the analysis and the outcome of interest was whether each pregnancy was intended or unintended. This measure has fairly high external validity and is widely used²⁸.

Sexual Orientation Congruence. Regarding identity, respondents were asked, “Do you think of yourself as... Heterosexual or straight; Homosexual, gay, or lesbian; Bisexual; Something else.” Those who answered “Heterosexual or straight” were considered to have heterosexual identity; all others were considered to have non-heterosexual identities. Attraction was evaluated using the question, “People are different in their sexual attraction to other people. Which best describes your feelings? Are you...Only attracted to males; Mostly attracted to males; Equally attracted to males and females; Mostly attracted to females; Only attracted to females?” Those who answered “Only attracted to males” were considered to have heterosexual attraction; all others were considered to have non-heterosexual (or “same-sex”) attraction.

Based on these two questions, respondents were classified into 3 mutually exclusive categories: *heterosexual women* (heterosexual in both identity and attraction), *congruent SMW* (non-heterosexual in both identity and attraction), and *incongruent SMW* (heterosexual identity and non-heterosexual attraction).

Sexual behavior is the third dimension of sexual orientation and was dealt with two ways. First, sexual experiences with men were treated as mediators since these are proximate determinants of unintended pregnancy. Second, we conducted additional analyses examining identity-behavior congruence. These findings were nearly identical to those for identity-attraction congruence.

Mediators. *Early first sex with a man* was categorized as first sex at age 13 or younger, ages 14-15, ages 16-17, or no sex with a man before age 18. We also included an indicator of the *number of lifetime male sexual partners* respondents reported as well as the *number of male sexual partners respondents had in the last 12 months*.

Covariates. Self-reported *race/ethnicity* was categorized as non-Hispanic white, non-Hispanic black, Hispanic (any race), or non-Hispanic other. We also examined *age at conception* and *pregnancy order* (specifically whether this was the first, second, third, or a higher order pregnancy). Respondents' *mother's education* level was categorized as less than high school, high school or equivalent, some college, or a bachelor's degree or higher. We used mothers' education level rather than respondents' since the two are highly correlated and younger women's education had not yet been completed. *Household income* was categorized as below the poverty line, 100-199% of poverty, 200-299% of poverty, or 300% and above.

Paper 2:

Sexual Orientation Concordance. Respondents were asked about three dimensions of sexual orientation. Identity was evaluated using the question, "*Do you think of yourself as... Heterosexual or straight; Homosexual, gay, or lesbian; Bisexual.*" Respondents were dichotomized as either having "heterosexual" identity (if they answered "heterosexual or straight") or having "lesbian or bisexual" identity (if they responded "homosexual, gay or lesbian," or "bisexual"). Regarding attraction, respondents were asked, "*People are different in their sexual attraction to other people. Which best describes your feelings? Are you... Only attracted to males; Mostly attracted to males; Equally attracted to males and females; Mostly attracted to females; Only attracted to females?*" Respondents who answered "only attracted to males" were considered to have heterosexual attraction; all others were considered to have some same-sex attraction. Respondents were also asked about sexual experiences with male and female partners. Respondents were considered to have had female sex partners if they reported "any sexual experience of any kind with another female." All respondents in the analytic sample had had sexual intercourse with a man. Those who reported *only* having male sex partners were coded as heterosexual in their behavior; those who reported having female sex partners (in addition to male partners) were coded as having engaged in same-sex sexual behavior.

Based on these questions, respondents were classified into three mutually-exclusive categories: heterosexual-identified concordant women (heterosexual identity, attraction, and behavior, $n = 4,491$), heterosexual-identified discordant women (heterosexual identity but with same-sex attraction and/or at least one female sexual partner; $n = 941$), and lesbian and bisexual-identified women (i.e. all women who identify as lesbian or bisexual; $n = 312$). Women in the latter two categories are considered "sexual minority" women, since they are not exclusively heterosexual.

Birth Happiness. Women's happiness about each birth in the sample was based on the following prompt: "*Please look at the scale on Card 39. On this scale, a zero means that you were very unhappy to be pregnant and a ten means that you were very happy to be pregnant. Tell me which number on the card best describes how you felt when you found out you were pregnant.*" In the analyses, the happiness scale was treated as a continuous variable.

Birth Intentions. Intention status was assessed using two questions. Women were asked, "*Right before you became pregnant, did you yourself want to have a(nother) baby at any time in the future?*" and, if so: "*Would you say you became pregnant too soon, at about the right time, or later than you wanted?*" Pregnancies were categorized as coming at the right time or later than desired ("intended"), coming too soon ("mistimed"), or not wanted at any time in the future ("unwanted"). Pregnancies that were either "mistimed" or "unwanted" are commonly referred to as "unintended." This variable describes the intention status of *pregnancies*, but since our study was limited to pregnancies that ended in *births*, we refer to this variable as "birth intentions."

Male Partnership Context. We included three sets of variables intended to capture the extent to which women's relationships with male partners were favorable for a birth. First, we included marriage and cohabitation at conception and birth. The NSFG measures: (a) formal marital status at time of conception, and (b) relationship status (including both marriage and cohabitation) at time of the birth. This information was coded into three categories: Married at time of conception (reference), unmarried at conception but married or cohabiting at birth, and unmarried at conception and not married or cohabiting at birth. We also included a dummy variable for whether the woman reported that she wanted to have a baby with that partner (=1 if "definitely yes" or "probably yes," otherwise =0). Women's reports of the fathers' pregnancy intentions were coded as: intended (if he considered the pregnancy to be on time or later than he wanted), mistimed/unwanted (if he considered the pregnancy to be earlier than he wanted or if he did not want any future birth), or indifferent/don't know (if the woman did not know her partner's intentions or believed he was indifferent).

Covariates. Covariates included self-reported race-ethnicity (non-Hispanic white, non-Hispanic black, non-Hispanic other, or Hispanic (any race)); mother's education (less than high school, high school graduate or GED, some college, bachelor's degree or higher, or respondent has no mother figure); household income (below the poverty line, 100-199% of poverty, 200-299% of poverty, or 300% of poverty or higher); religion in which respondent was raised (no religion, Catholic, Protestant, or other religion); age at conception (in years); birth order (1, 2, 3, or 4 or more); and survey wave (2006-2010, 2011-2013, or 2013-2015).

e. Statistical techniques employed

Paper 1:

Our first hypothesis was that among SMW, unintended pregnancy risk would be concentrated among those whose sexual identity and attractions were incongruent (i.e. heterosexual-identified women with same-sex attractions). To address our first hypothesis, we employed multivariable logistic regression. First, we compared heterosexual women to all sexual minority women (i.e. anyone with non-heterosexual identity and/or same-sex attraction). Then we examined the role of identity-attraction congruence. Both models controlled for all possible confounders.

Our second hypothesis was that higher risk for unintended pregnancy among incongruent SMW would be partially explained by greater number and greater turnover of male sexual partners and higher likelihood of early sex. These specific factors have been linked to unintended pregnancy and may be more common among sexual minority individuals^{16,29-33}. To address the second hypothesis, we examined whether sexual experiences mediated the relationship between sexual orientation congruence and the odds of having an unintended pregnancy. Mediators included early first sex and the number of male partners (recent and lifetime) and were added sequentially.

Paper 2:

First, we examined whether birth happiness varied by sexual orientation concordance. We hypothesized that heterosexual-identified discordant women would be unhappier about their births than heterosexual-identified concordant women. To address the first research question, we estimated linear regression models predicting the level of happiness (0-10) about a given birth. Although the focus of the paper was heterosexual-identified discordant women, specifically, we also report results for those who identify as lesbian or bisexual. Therefore, models examined whether birth happiness differed for heterosexual-identified discordant women and lesbian- and

bisexual-identified women, compared to heterosexual-identified concordant women (reference category). The models controlled for potential confounding variables described above.

Second, we examined whether birth intentions and male partner relationship characteristics *mediated* the association between sexual orientation concordance and birth happiness. We hypothesized that if heterosexual-identified discordant women were unhappier about their births, it would be partially due to having more mistimed and unwanted births (as opposed to intended births) and less favorable male partnerships for a birth, compared to heterosexual-identified concordant women. To answer the second question, we added birth intentions to the baseline model, followed by variables capturing male partnership context.

Third, we examined whether birth intentions *moderated* the association between sexual orientation concordance and birth happiness. In other words, is the happiness gap by sexual orientation concordance the same for intended births as it is for mistimed and unwanted births? We hypothesized that the difference in happiness between heterosexual-identified discordant versus concordant women would be greater for mistimed and unwanted births, compared to intended births. To address the third research question, we added interaction terms (sexual orientation concordance x birth intentions) to the baseline model. We then extended this model by graphing predicted happiness values for combinations of sexual orientation concordance by birth intention.

f. Detailed Findings

Paper 1:

Overall, SMW were at higher risk for unintended pregnancy than heterosexual women (OR=1.26, $p < 0.01$), and SMW with identity-attraction incongruence, in particular, were at elevated risk for unintended pregnancy (OR=1.28, $p < 0.01$).

Next, we found that the coefficient for SMW with identity-attraction incongruence was attenuated after adjusting for early first sex (OR=1.22, $p < 0.01$). When lifetime and recent male sexual partners were entered into the model, the coefficient for incongruent SMW was reduced to non-significance (OR=1.08).

Paper 2:

Heterosexual-identified discordant women and lesbian- and bisexual-identified women were both unhappier about their births than were heterosexual-identified concordant women. The difference was more than half a point on the 10-point scale ($\beta = -0.71$ for heterosexual-identified discordant women; $\beta = -0.79$ for lesbian and bisexual-identified women). The next model added intention status. The coefficient for lesbian- and bisexual-identified women was no longer significant, indicating that this association was accounted for entirely by the fact that this group of women was less likely to have intended births compared to their heterosexual concordant counterparts. For heterosexual-identified discordant women, the coefficient was reduced but still statistically significant ($\beta = -0.51$), suggesting that the association was partially mediated by the fact that this group was less likely to have intended births than heterosexual concordant women.

Variables capturing male partnership context partially mediated the association between discordance and birth happiness; the coefficient for heterosexual-identified discordant women (from $\beta = -0.51$ to -0.42) was reduced, suggesting that part of the reason this group was

unhappier about their births was related to the fact that their relationships with male partners were less favorable for a pregnancy, compared to their heterosexual concordant counterparts.

As expected, birth intentions moderated the association between sexual orientation concordance and happiness. The interaction term between the heterosexual-identified discordant group and unwanted births was sizable and significant; the happiness gap between heterosexual-identified concordant and discordant women was especially large for unwanted births.

g. Discussion and Interpretation of Findings

Paper 1:

Our study suggests that differences in sexual experiences may be one of the key mechanisms shaping the higher risk of unintended pregnancy among adult SMW with identity-attraction incongruence. Although incongruent SMW engaged in these behaviors at higher rates than other women, we were unable to examine the reasons for this directly.

Although SMW have been largely ignored in previous pregnancy prevention efforts, our findings indicate that they are in need of comprehensive reproductive health care to reduce their risk of unintended pregnancy. Reproductive health providers should be aware that those at highest risk – i.e. women with heterosexual identity and same-sex attraction – will be difficult to identify. Thus, providers should routinely ask women, regardless of their sexual identity, about their sexual attractions and behaviors with male and female partners, as well as about their pregnancy intentions, and provide information and services accordingly.

Paper 2:

While the association between sexual orientation concordance and birth happiness was mediated in part by intendedness and partner context, these variables did not fully account for the association. It is possible that for heterosexual-identified discordant women, “sexual minority stress” contributed to their unhappiness.^{15,17} For instance, discordant women may be experiencing stress from concealing same-sex attractions, internalized homo/biphobia, stigma and discrimination, or possibly being in relationships with male and female partners at the same time.^{15,17} Any or all of these stressors could have led to feeling less happy about their births.

In addition to “sexual minority stress,” the literature on sexuality and pregnancy raises several possible explanations for the higher levels of unhappiness among heterosexual-identified discordant women. First, women often report that a pregnancy affirms the relationship in which it occurs, as well as the sexual orientation that relationship implies.³¹ Experiencing a pregnancy within a heterosexual relationship and symbolically emphasizing that relationship with a baby may therefore create feelings of unhappiness for women who have same-sex attractions or behaviors. Second, in the U.S. there is a high degree of pressure to fit heteronormative expectations and to “prove” heterosexuality through sex.³² Pregnancy is another avenue through which women might “prove” their heterosexuality, but if the woman does not truly want a baby, she may find herself unhappy about the pregnancy once it occurs. Third, pregnancy may make a heterosexual-identified discordant woman feel “invisible.” Bisexual-identified women often report that pregnancy makes them feel invisible since people (incorrectly) assume they are heterosexual.³³ For heterosexual-identified women with same-sex attractions or behaviors, a pregnancy may make her feel misunderstood or marginalized, leading to unhappiness. Finally, for discordant women who feel conflicted about living a heterosexual life, a birth with a male

partner could mean being “stuck” in such a life for the foreseeable future, which may create unhappiness.

h. Conclusions to be drawn from findings (with reference to data supporting each), including potential public health impact

Paper 1:

Adult sexual minority women – particularly SMW who were incongruent, with heterosexual identities but some same-sex attraction – were more likely to have unintended pregnancies, compared to heterosexual women. These differences in unintended pregnancy risk were tied to the fact that SMW with identity-attraction incongruence had more male sex partners than their heterosexual counterparts. Researchers should explore the conditions that put heterosexual-identified women with same sex attractions at increased risk for unintended pregnancy. Clinicians should consider these dynamics when screening patients for contraceptive counseling.

Paper 2:

We found that heterosexual-identified discordant women were less happy about their births than their exclusively heterosexual counterparts, in part because their births were less likely to be intended and their relationships with male partners were less favorable for a birth. Birth intentions moderated the association: the difference in happiness between heterosexual-identified concordant and discordant women was larger for unwanted births compared to intended births. Clinicians should make an effort to identify these women and provide contraceptive counseling, pre- and post-natal care, and other services accordingly.

i. Explanation of study limitations

Paper 1:

There were several limitations. First, pregnancies occurred in the past, whereas sexual orientation was measured at the time of the survey. Unfortunately, there is no nationally-representative data set that includes both the intention status of pregnancies and women’s sexual orientation at the time of those pregnancies. Assuming that we have misattribution in both directions, it would have the effect of adding noise to the data, such that our reported results would be conservative. Ideally, future studies would collect data on sexual orientation, pregnancy intentions, and actual pregnancies prospectively.

Second, approximately 11% of pregnancies experienced by NSFG respondents were unreported because of respondents’ reluctance to discuss prior abortions. In our supplementary analyses, we found that both unintended pregnancies ending in abortion and unintended pregnancies with other outcomes (e.g. birth, miscarriage) were more common for SMW than heterosexual women, which supports our findings. In order for the NSFG’s “missing abortions” to invalidate our results, heterosexual women would have to have been *more* likely to underreport their abortions than SMW. This is unlikely, since economically or socially disadvantaged women are most likely to underreport³⁴. Thus, if any difference in abortion reporting occurred, it is likely that SMW, a socially disadvantaged group, would have been more prone to underreporting than heterosexual women, which would make our findings conservative. For the future, we suggest that questions related to sexual identity and attraction be added to clinic-based surveys of abortion patients in order to empirically identify the extent of abortion underreporting for SMW.

Finally, we were not able to identify women who became pregnant via artificial insemination; instead, we excluded pregnancies to women who had never had sex with a man. Ideally, we would have excluded pregnancies from artificial insemination in order to limit our analysis to a more homogeneous group of pregnancies. Based on the available data, however, there seems to be little difference between heterosexual and sexual minority women in receipt of reproductive assistance; the proportion of pregnancies to women who had ever received medical help to get pregnant was very similar for heterosexual women and SMW in the NSFG.

Paper 2:

This study has several limitations. First, we were unable to consider the role of female partners since the survey does not ask about female partners at the time of each pregnancy. We believe that the vast majority of pregnancies among heterosexual-identified discordant women occurred with male partners (both because of women's reported identity and the fact that nearly all women reported on how "the father of the pregnancy" felt about it). It would be useful for the NSFG and other surveys to account for a wider range of circumstances surrounding each pregnancy beyond having one male partner. For instance, determining whether women had a female partner at the time of pregnancy and birth, as well as the level of support received from their female partner(s) would provide valuable information and would allow researchers to better account for the full range of women's experiences. Likewise, it would have been advantageous to identify how each birth came about (e.g., heterosexual sex, donor sperm, IVF, etc.). We hope the NSFG will begin to collect this information. Second, we were unable to compare happiness levels by sexual orientation for pregnancies that did not end in birth. This is because abortions are severely underreported in U.S. surveys (including the NSFG), and the degree of underreporting varies by women's characteristics.³⁴ We therefore chose to use an unbiased sample of pregnancies ending in birth, rather than a potentially biased sample of all pregnancies. One advantage of examining only births, however, is that they constitute a more uniform group. How one feels about a birth may have more long-term consequences for well-being, whereas feelings about a pregnancy that ends in abortion or miscarriage may be more limited in its effects on well-being.³⁵

j. Comparison with findings of other studies, highlighting this study's new contributions to the literature

Paper 1:

Our findings fit with prior research on adolescent pregnancy among SMW and extend it in important ways. Using multiple dimensions of sexual orientation, Charlton and colleagues (2013) found that adolescent sexual minorities were more likely to experience early pregnancies than their heterosexual peers. Tornello et al. (2013) showed that adolescents who identified as bisexual were more likely to report terminating a pregnancy, and a third study demonstrated higher rates of pregnancy among New York City high school students who identified as sexual minorities or had same-sex partners.³⁶ Our work expands the age range under consideration to all adult reproductive-age women (18-44) and shows disparities in unintended pregnancy, rather than all pregnancies or terminated pregnancies. Further, we consider congruence across dimensions of sexual orientation, which most studies have not (Charlton et al. 2013 is one exception). We found that elevated risks for unintended pregnancies were concentrated among women who identified as heterosexual but had some same-sex attraction.

Paper 2:

Our results are consistent with previous research in which sexual minority women (particularly bisexual women, women who have both male and female sex partners, and/or discordant women), are more likely to engage in a variety of sexual risk behaviors and experience more negative sexual health outcomes than their heterosexual counterparts.^{12,14,15,36-38} Greater unhappiness about births – particularly unwanted births – among heterosexual-identified discordant women can now be added to this list.

k. Possible application of findings to actual MCH populations and health care delivery situations, including recommendations when appropriate

Results reinforce the need for clinicians and others who work on sexual and reproductive health to be inclusive of SMW in their programs and services. Providers should get in the habit of – and become comfortable with – asking women about their sexual attractions, behaviors, and relationships with men, women, and transgender persons. This could be done in various ways, such as on intake forms and during counseling and care sessions. Asking such questions can inform a non-judgmental dialogue about issues specific to the sexual, reproductive, contraceptive, and relationship concerns of each woman. Such efforts, when done in a sensitive and competent manner, would represent an important step toward improving the sexual and reproductive health of SMW, including helping women time their pregnancies such that they consider those pregnancies a source of happiness.

4) List of products (peer reviewed articles, books, chapters in books, conference presentations, etc.).

Peer reviewed articles:

Hartnett C, Lindley L, Walsemann K. (2017) Congruence across sexual orientation dimensions and risk for unintended pregnancy among adult U.S. women. *Women's Health Issues*. 27(2): 145-151.

Hartnett C, Walsemann K, Lindley L, Negraia D. Sexual orientation concordance and (un)happiness about births. Accepted for publication (June 2017) in *Perspectives on Sexual and Reproductive Health*.

Conference presentations:

“Sexual Orientation Concordance and (Un)happiness about Births.” Presented at the Population Association of America Annual Meeting, Chicago, IL, April 27-29, 2017.

“Sexual Orientation and the Risk for Unintended Pregnancy Among U.S. Women of Reproductive Age.” Presented at the Population Association of America Annual Meeting, San Diego, April 30-May 2, 2015.

a. Provide a complete list of actual or tentative titles and authors of manuscript activities to date. Include manuscripts that are being planned, in progress, submitted, under review or revision, accepted for publication, Epub ahead of print, or in print.

Hartnett C, Lindley L, Walsemann K. (2017) Congruence across sexual orientation dimensions and risk for unintended pregnancy among adult U.S. women. *Women's Health Issues*. 27(2): 145-151.

Hartnett C, Walsemann K, Lindley L, Negraia D. Sexual orientation concordance and (un)happiness about births. Accepted for publication (June 2017) in *Perspectives on Sexual and Reproductive Health*.

5) Dissemination activities and plans beyond peer-reviewed publications

We have used Facebook and Twitter to publicize our findings and published articles. Results have also been highlighted on college and University websites (at Mason).

6) Describe plans to continue this line or program of research through additional external funding

We plan to continue this line of research but have not decided what funding to apply for.

One avenue we are currently exploring is R01 (and R15) NIH grant opportunities to assess other pregnancy and other health outcomes (i.e., experience with bullying and violence) among school-aged youth (9th-12th graders) based on sexual minority concordance/discordance using YRBS (Youth Risk Behavior Surveillance) data from states and large urban school districts that measured two dimensions (identity and behavior) of sexual orientation.

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