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Understanding the Link Between Adolescent Same-Gender Contact and Unintended Pregnancy: The Role of Early Adversity and Sexual Risk Behavior

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Abstract

Past research suggests an apparent paradox: Women who engage in same-gender sexual behavior show higher rates of unintended pregnancy than women with exclusive other-gender sexual behavior. Such women also have disproportionate rates of early adversity (both harshness, such as abuse or neglect, and unpredictability, such as father absence). We used the Add Health data ($N = 5{,}617$ cisgender women) to examine the relative contributions of early adversity, adolescent same-gender sexual behavior, and general sexual risk behavior to women's risks for adult unintended pregnancy. Women who engaged in adolescent same-gender sexual behavior were more likely to report childhood adversity, and both childhood adversity and adolescent same-gender behavior made independent contributions to subsequent rates of unintended pregnancy. The association between adolescent same-gender sexual behavior and adult unintended pregnancy was partially attributable to the fact that women with adolescent same-gender sexual behavior engaged in greater sexual risk behavior more broadly. These findings suggest that same-gender sexual behavior in adolescence may relate to a broader set of sexual risk behaviors that augment future risk for unintended pregnancy, independent of sexual identity. We draw on life history theory to explain this pattern of results and suggest directions for future research.

Keywords Sexual orientation · Same-gender sexual behavior · Childhood adversity · Unintended pregnancy · General risk behavior · Life history theory

Introduction

The USA has more unintended pregnancies than any other developed nation. Around half of such pregnancies are reported as being unintended or accidental (Hartnett et al., 2017). It is critically important for researchers to develop a deeper understanding of the characteristics and experiences that predict unintended pregnancy risk, due to the high risk of associated adverse health and behavioral outcomes. For example, women who experience unintended pregnancy have an increased risk for maternal depression, anxiety, and low pre-natal and post-natal care (Hartnett et al., 2017).

While many factors are associated with increased risks for unintended pregnancy, such as race, ethnicity, and socio-economic status (Finer & Zolna, 2016), one factor that has received increasing attention in recent years is same-gendergender behavior. Research has found that adolescent and adult women who have engaged in sex with both women and men show greater risks for unintended pregnancy than women who have engaged in sex only with men (Charlton et al., 2013; Goldberg et al., 2016). Interestingly, Everett et al. (2017) found that this effect was not restricted to women with a lesbian or bisexual identity. For example, heterosexually identified pregnant women with histories of same-gender sexual contact are disproportionately likely to indicate that their pregnancy was unintended (Everett et al., 2017). Understanding why same-gender contact is associated with unintended pregnancy risk is important for developing targeted interventions to reduce the prevalence of unintended pregnancy in the highest risk populations. The present study adopts a novel theoretical approach to this question: Life History Theory.

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Sexuality and Life History Theory

Life history theory (LHT) is an evolutionary theory that posits that early life experiences calibrate a child's physical and neurobiological development in a manner that would have been adaptive in the context of our evolved history. According to LHT, early life experiences serve as an indicator of the types of environments the developing child is likely to experience as an adult. Most notably, early life adversity (such as poverty, abuse, and neglect) signals to the developing child that the future is likely to be harsh and uncertain (Brumbach et al., 2009). In such environments, it would be adaptive for the child to mature quickly and to be prepared to take risks to meet their immediate needs, given that life may be short and long-term support and nurturance cannot be relied upon (Del Giudice et al., 2011). The resulting developmental profile, characterized by early sexual maturation, early sexual debut, and high sexual and non-sexual risk taking, is denoted as a fast life history strategy. Something to note, however, is that many of the behaviors that would have been considered adaptive during our evolved history, such as early reproduction and sexual risk taking, are far less socially acceptable in our current social context. Further, engagement in many of these behaviors can result in social and physical harm (Reyna & Farley, 2006). Therefore, while we understand that many of the sexual risk behaviors outlined below result from evolved motivations, we also acknowledge that these behaviors may no longer be seen as adaptive in our current context.

Further, while much of the theoretical and empirical work surrounding LHT suggests that the pressures exerted from adversity experience can augment both men's and women's future behavior, we have chosen to focus on cisgender women for this manuscript because our primary outcome is unintended pregnancy risk, which carries unique health risks for cisgender women.

Consistent with LHT, past research has identified robust associations between experiences of early adversity and increased engagement in sexual risk-taking (e.g., Abajobir et al., 2017; Lacelle et al., 2012; Roemmele & Messman-Moore, 2011; Wilson & Widom, 2011). LHT also explains that women exposed to early adversity (specifically, abuse, neglect, and/or changes in family dynamics and parental care within the first 5–7 years of life) tend to reach sexual maturation at an earlier age (Ellis et al., 2003; Fortenberry, 2013; Tither & Ellis, 2008), and early sexual maturation has been robustly associated with multiple sexual risk behaviors for women including early sexual initiation (e.g., Ellis et al., 2003; Hillis et al., 2001; Simpson et al., 2012), unprotected sexual behavior (e.g., Banducci et al., 2014; Senn & Carey, 2010; Senn et al., 2006), and high numbers of sexual partners (e.g., Chartier et al., 2009; Roemmele & Messman-Moore, 2011; Simpson et al., 2012).

If early adversity is associated with sexual risk behavior, and sexual risk behavior is associated with unintended pregnancy risk (Everett et al., 2014; Goodenow et al., 2008; Mojola & Everett, 2012; Tornello et al., 2014; Xu et al., 2010), then we should observe associations between early adversity and unintended pregnancy. Previous research suggests that this may be the case (Ellis et al., 2003; Fergusson et al., 1997; Nettle et al., 2010). Fergusson et al. (1997) argued that the association between early adversity and unintended pregnancy is attributable to the idea that women exposed to early adversity are more likely to pursue sexual risks such as early sexual debut and multiple sexual partners. This is essentially the same argument made by LHT: i.e., women exposed to early adversity have a higher pregnancy risk because of their high-risk sexual behavior. The unique contribution of LHT is that it offers a theoretical explanation for this link by positing that exposure to adversity shifts a child's development in a manner that prioritizes the want for immediate delivery of rewards as opposed to delayed rewards that could have the possibility for greater gains. Of course, this is not to say that all sexual risk-taking is attributable to early life adversity: Well-documented factors such as peer influence, low parental monitoring, and opportunity increase participation in these social and sexual risk behaviors, independent of early adversity. Later experiences of adversity (during and after puberty) may also play a role in shifting individuals toward fast life history strategies, as noted by Del Giudice et al. (2011).

It also bears noting that recent extensions of LHT have found that different types of adversity appear to have different patterns of association with later behavior. Simpson et al., (2012) found that unpredictable early environments were more strongly associated with women's fast life histories than harsh environments. Yet other research has found that indicators of both harshness and unpredictability (i.e., victimization, parental hostility, lower-quality living environments) can predict female sexual risk behavior (Belsky et al., 2012; Brumbach et al., 2009). More research is needed to differentiate the potential role of harsh versus unpredictable early environments on developmental profiles that may augment pregnancy risk. This ambiguity motivated us to examine the differential influence of harshness and unpredictability using the measures available to us.

Life History Theory and Same-Gender Behavior

One of the underappreciated advantages of LHT is that it provides a coherent and testable explanation for the otherwise perplexing link between unintended pregnancy and women's same-gender behavior. As reviewed above, LHT posits that early adversity could potentially influence a woman's unintended pregnancy risk by accelerating her sexual development and augmenting her willingness to take risks for faster

delivery of rewards even in the face of increased social and physical harm. As supported in previous research, accelerated sexual development and need for immediate delivery of rewards can manifest as increased engagement in risk taking characteristics of a fast life history strategy, such as an early sexual debut, the pursuit of a high number of sexual partners, substance use, and inconsistent contraceptive use (e.g., Banducci et al., 2014; Edwards & Coleman, 2004; Hillis et al., 2001; Reyna & Farley, 2006; Ryan et al., 2015; Senn & Carey, 2010). All of these behaviors increase the risk of unintended pregnancy as well as STD/STIs. Same-gender sexual behavior has received little attention by scholars of LHT, but it bears greater consideration. Extensive research has demonstrated that individuals with early adversity show disproportionate rates of later same-gender sexual behavior (reviewed in Diamond et al., 2021). Yet such individuals also show disproportionate rates of other types of sexual behaviors, such as early sexual debut or having multiple partners, which are known to increase a woman's unintended pregnancy risk. Perhaps, then, same-gender sexual behavior predicts unintended pregnancy simply because the types of women who are willing to pursue same-gender behavior, despite its risks for stigma or harassment) are probably also willing to pursue other sexual behaviors with different types of risk.

Accordingly, if early adversity augments an individual's tolerance for risk (as predicted by LHT), this effect should be observed for all sexual behaviors that entail risk, regardless of the specific type of risk. Although same-gender behavior is not "risky" with respect to pregnancy or sexually-transmitted infections, it carries steep risks for harassment and stigmatization, and these risks often lead individuals to avoid same-gender sexual behavior entirely, even if they strongly desire such behavior (Diamond, 2021). In short, reproductive health risks are not the only types of risks that may influence a woman's participation in one type of sexual behavior versus another. If we expect (as predicted by LHT) that women with a high tolerance for risk will be disproportionately likely to experience an unintended pregnancy (because they are not troubled enough by the risk of pregnancy to reliably use contraceptives), then we need to consider all of the sexual behaviors that may indicate a high tolerance for risk, even those behaviors whose "riskiness" is not directly related to pregnancy.

Same-gender behavior might prove to be a particularly powerful indicator of risk-tolerance, given that its associated risks (stigmatization, social isolation, physical violence, victimization, bullying, family rejection) are pervasive and serious, especially during the adolescent years. Hence, anything that reduces a woman's perception of these risks (for example, her own degree of risk tolerance or her access to a supportive familial/social network) should increase rates of same-gender sexual contact. This is supported by findings from a recent groundbreaking study of genetic influences on same-gender behavior, which used the full genomes of over 477,000 UK and US adults, 4% of whom reported having engaged in same-gender behavior at least once (Ganna et al., 2019). The authors found that the genes associated with the likelihood of ever engaging in same-gender behavior overlapped with genes associated with other risk behaviors, such as having multiple partners, substance use, and the personality trait of "openness to experience" (reviewed by Diamond, 2021). Hence, same-gender behavior may "cluster" with other sexual risk behaviors simply because all of these behaviors are potentially dangerous, albeit in different ways and for different reasons. Risk-averse individuals will pursue less of all these behaviors, and risk-tolerant individuals will pursue more of them. In fact, participation in same-gender sexual behavior might actually be more strongly influenced by risk tolerance than other sexual behaviors, given the dangers that it poses for social/familial rejection and for violence. Hence, adolescent participation in same-gender contact might prove to be a potent "marker" for generalized risk tolerance, and hence an indicator of future unintended pregnancy risk. This possibility is supported by the fact that adolescent same-gender behavior typically occurs *alongside* other-gender behavior, instead of supplanting it (Matthews et al., 2014; McCabe et al., 2011; Mustanski et al., 2014; Priebe & Svedin, 2013). Although some youth who engage in adolescent same-gender behavior go on to identify as lesbian/gay or bisexual, others go on to identify as heterosexual (Everett, 2013). Hence, adolescent same-sex behavior is not a straightforward proxy for sexual identity and should be considered separately from sexual identity when considering its relevance for future pregnancy risk.

In short, life history theory suggests that adolescent engagement in same-gender sexual behavior may indicate a "fast life history" strategy (i.e., a high tolerance for risk-taking more broadly), among both heterosexual and non-heterosexual women (notably, many heterosexually identified women report finding same-gender sexual contact arousing and rewarding, even when it is not their most preferred form of sexual contact; reviewed Diamond & Alley, 2019)There is extensive evidence supporting this possibility. Women reporting same-gender sexual behavior (especially those who engage in both same-gender and other-gender sexual contact) report the greatest number of sexual partners (Goodenow et al., 2008; Tornello et al., 2014; Xu et al., 2010), the highest rates of substance use (Blosnich & Andersen, 2015; Goodenow et al., 2008; Hughes et al., 2014; Matthews et al., 2014; McLaughlin et al., 2012; Saewyc et al., 2008), and, as noted, the highest rates of adolescent pregnancy (Saewyc et al., 2008; Tornello et al., 2014). Notably, these findings extend to women who do not necessarily identify as lesbian or bisexual, such as women who describe themselves as "mostly heterosexual" (Hartnett et al., 2017).

Further, if "fast life history" orientations toward risk are amplified by early life adversity, this helps to explain why women exposed to early adversity show higher rates of same-gender sexual behavior than women without such histories. Women who identify as non-heterosexual report rates of early adversity up to 3 times higher than those of self-identified heterosexuals (e.g., Alvy et al., 2013; Austin et al., 2008; Balsam et al., 2005; Blosnich & Andersen, 2015; Blosnich et al., 2014; Friedman et al., 2011), and rates of early adversity are also higher among heterosexually identified individuals with periodic same-gender contact, compared to heterosexually identified women who pursue only other-gender sexual contact (Zou & Andersen, 2015).

The Current Study

Hence, the existing body of findings, viewed through the lens of life history theory, suggests the following hypothetical model: Early life adversity fosters the development of a fast life history orientation toward risk, characterized by a range of sexual risk behaviors including adolescent same-gender contact. These behaviors, collectively, may facilitate unintended pregnancy risk in adulthood. A key prediction of this hypothetical model is that adolescent same-gender contact should not be independently associated with either early adversity or unintended pregnancy. Rather, its association with both of these variables should be due to its relationship with general sexual risk-taking(such as early sexual debut, high numbers of sexual partners, poor contraceptive use, and substance use). In essence, to the extent that adolescent same-gender contact is associated with childhood adversity and adult same-gender contact, these associations may actually be due to a third variable: generalized sexual risk tolerance. Accordingly, once general risk behavior is accounted for, we should observe no independent association between adolescent same-gender sexual behavior and either early adversity or unintended pregnancy (Fig. 1).

We test these predictions with two series of multivariate regression models. The first series of models (Table 3) focuses on the link between early adversity and adolescent same-gender sexual behavior. We begin by predicting adolescent same-gender sexual behavior from early life adversity (controlling for demographic factors including adult self-reported sexual identity). Consistent with previous research,

we expect to find a significant link between early adversity and adolescent same-gender contact. Notably, a unique advance of our approach is that we will model harshness and unpredictability separately, rather than collapsing them together, in order to explore whether they show different patterns of association with adolescent same-gender sexual behavior. Next, we will add a set of variables to the model representing generalized sexual risk behavior (age at sexual initiation, number of male sexual partners, contraceptive use, and substance use). In this expanded model, we expect that the sexual risk behaviors will significantly predict adolescent same-gender sexual behavior, but early life adversity will not (Hypothesis 1). This result would support our prediction that associations between early life adversity and adolescent same-gender sexual behavior are partially attributable to the link between early adversity and general risk tolerance, which should facilitate both same-gender sexual behavior and other forms of high-risk sexual behaviors.

Our second set of models (Table 4) focuses on the prediction of adult unintended pregnancy. We will begin by predicting unintended pregnancy by adolescent same-gender contact (controlling for sexual identity and other demographic factors). Consistent with previous research, we expect to find a positive association. We will then add the set of variables representing general sexual risk behavior. We expect that these sexual risk behaviors will significantly predict unintended pregnancy, but that adolescent same-gender sexual behavior will no longer be a significant predictor in this broader model (Hypothesis 2). Such a result would support our view that the link between adolescent same-gender sexual behavior and adult unintended pregnancy is actually attributable to the fact that both of these outcomes are fostered by general risk tolerance. Hence, after controlling for risk tolerance (with covariates indicating women's participation in other high-risk behaviors, like poor contraceptive use), we should no longer find a significant association between adolescent same-gender sexual behavior and adult unintended pregnancy.

Finally, we will investigate the specific contribution of early life adversity to unintended pregnancy to test whether previously documented links between early life adversity and pregnancy risk can be meaningfully attributed to a "fast life history" orientation toward risk. We will first run a model predicting unintended pregnancy from early life adversity

Fig. 1 The current study predictions of the association between early life adversity, unintended pregnancy, same-gender sexual behavior and broader risk taking
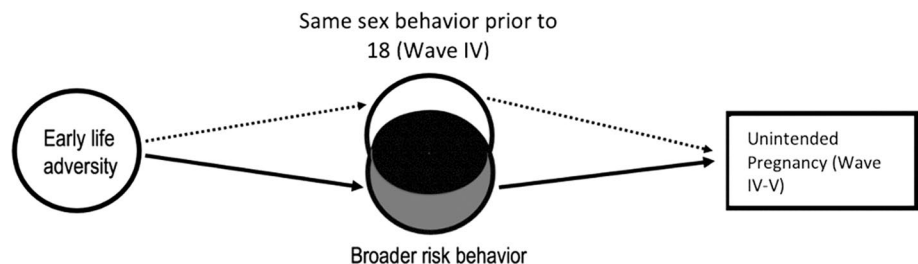
(coded separately as harshness and unpredictability), controlling for demographic factors. We expect to find a significant association (although we do not have a specific prediction regarding the relative contributions of harshness versus unpredictability). Next, we will add both generalized risk behavior and adolescent same-gender sexual behavior to the model. We expect that in this full model, generalized risk behavior will show significant associations with unintended pregnancy, but the effects of early adversity and adolescent same-gender sexual behavior will be nonsignificant (Hypothesis 3). This would suggest that the pathway from early adversity to unintended pregnancy operates through "fast life history" behaviors associated with sexual risk, a set of behaviors that includes adolescent same-gender sexual behavior.

Method

Participants

Data come from the National Longitudinal Study of Adolescent to Adult Health (Add Health). Since the manuscript analyzes pre-collected data, the study is IRB exempt. The initial Add Health sample was drawn from 80 high schools and 52 middle schools throughout the USA with unequal probabilities of selection (Harris, 2013). A subsample of students (n = 20,747) were asked to complete additional in-home interviews and were contacted for follow-up interviews between 2001 and 2002 (Wave III) and 2007–2008 (Wave IV). Between 2016 and 2018 (Wave V), respondents were contacted again for follow-up interviews. Response rates were 77.4% for Wave III and 80.3% for Wave IV.

A total of 10,507 women were initially included. A total of 2641 people were not followed up in Wave IV and therefore excluded from this analysis. We excluded 751 women who had pregnancies before the age of 18 because if included, it would be impossible to determine if the engagement in adolescent same-gender behavior occurred before or after the pregnancy (because our model specifically views adolescent same-gender contact as part of a suite of behaviors that increases the likelihood of eventual pregnancy, we wanted to focus only on pregnancy outcomes that postdated a woman's involvement in same-gender sexual behavior). In all, 1237 participants had missing data for our measure of early neglect (because this scale was only included in Wave III, which had a particularly low response rate), and were therefore excluded from the analysis. An additional 360 women had missing data on one or more of our key variables and therefore excluded from analysis. Our final sample included 5617 women. Our analytic sample was more likely to be white than the rest of the sample and less likely to identify as "mostly heterosexual."

Measures

Dependent Variables

Same-gender sexual behavior before the age of 18 was measured at Wave IV using the survey item: "Considering all types of sexual activity, with how many female partners did you have sex before you were 18 years old, even if only one time?" We coded those who responded as having one or more female partners as having had same-gender sexual behavior before the age of 18 (0 = no, 1 = yes). Unintended pregnancy occurring after age 18 was assessed at Wave IV and V of data collection (0 = unintended, 1 = planned, or had not had a pregnancy).

Independent Variables: Early Adversity

As noted earlier, we have chosen to examine two forms of early adversity, based on previous research (e.g., Belsky et al., 2012; Brumbach et al., 2009): harshness and unpredictability. Harsh early experiences involve direct threats to well-being, including physical violence as well as insufficient basic resources such as food (Belsky et al., 2012). Harsh early experiences, such as abuse and neglect, are perhaps the most widely studied predictors of "fast" versus "slow" life history orientations toward risk (e.g., Belsky et al., 2012), yet another important type of early adversity is unpredictability in the childhood environment, such as frequent changes in family structure, living arrangements, or parental employment (Belsky et al., 2012; Simpson et al., 2012). Based on the data available in the ADD Health data set we have identified four questions that assess early harshness and three questions that assess early unpredictability. Harshness was constructed as a scale measure, including sexual abuse, physical abuse, neglect, and poverty, with a Cronbach's alpha of 0.38. Sexual abuse was measured using the following survey items from Wave III and Wave IV, respectively: "By 6th grade, how often had one of your parents or other adult caregivers touched you in a sexual way, forced you to touch him or her in a sexual way, or forced you to have sexual relations?" and "Before your 18th birthday, how often did a parent or other adult caregiver touch you in a sexual way, force you to touch him or her in a sexual way, or force you to have sexual relations?" If a respondent reported one or more instances of sexual abuse in either wave, we coded them as having experienced sexual abuse (0 = no, 1 = yes). Physical abuse was measured using the following survey items from Wave III and Wave IV, respectively: "By 6th grade, how often had your parents or other adult caregivers slapped, hit, or kicked you?" and "Before your 18th birthday, how often did a parent or adult caregiver hit you with a fist, kick you, or throw you down on the floor, into a wall, or down stairs?" If a respondent reported one or more instances of physical abuse in either

wave, we coded them as having experienced physical abuse (0 = no, 1 = yes). Neglect was measured using the following survey item from Wave III: "By 6th grade, how often had your parents or other adult care-givers not taken care of your basic needs, such as keeping you clean or providing food or clothing?" If a respondent reported one or more instances of neglect, we coded them as having experienced neglect (0 = no, 1 = yes).. Childhood federal poverty level was obtained from parent's reported income and household size at Wave I. We created a dichotomous variable that included respondents whose parent's income was equal to or less than 100% of the poverty level for their household size (0 = no, 1 = yes). We summed responses, and the final scale range was 0 to 4.

Unpredictability was constructed as a scale measure, including father absence, and accessibility of alcohol or drugs in the home with a Cronbach's alpha of 0.13. Father absence was constructed using Wave I data and was based on whether or not the respondent's biological father did not live in their household (0 = no, 1 = yes). Alcohol in the home was measured using the Wave 1 item: "Is alcohol easily available to you in your home?" Responses were dichotomized (0 = no, 1 = yes). Drugs in the home was measured using the Wave 1 item: "Are drugs easily available to you in your home?" Responses were dichotomized (0 = no, 1 = yes).

Demographics

Age was derived from the respondent's date of birth from Wave I.

Race/ethnicity was measured at Wave I as a categorical variable to include Black, Latina, Indian, Asian, Other, and White (referent).

Sexual identity was measured in waves III, IV, and V of the Add Health survey and asked respondents, "Please choose the description that best fits how you think about yourself: 100% heterosexual (straight); mostly heterosexual (straight), but somewhat attracted to people of your own sex; bisexual, that is, attracted to men and women equally; mostly homosexual (gay), but somewhat attracted to people of the opposite sex; 100% homosexual (gay); or not sexually attracted to either males or females." Mostly gay and gay were combined. Heterosexual was the referent. We assigned respondents to the sexual identity that they chose in Wave III. If they were missing in Wave III, we used the identity chosen in Wave IV. We chose the Wave III identity because it is our best estimate of the identity prior to the unintended pregnancy.

Psychological and Behavioral Risk Factors

Marijuana use was measured at Wave I using the question "How old were you when you tried marijuana for the first time?" We code respondents who reported any use as having used marijuana (0 = no, 1 = yes).

Sexual Risk Factors

Number of male partners was derived from the Wave IV item "Considering all types of sexual activity, with how many male partners did you have sex before you were 18 years old, even if only one time?" The variable ranged from 0 to 30.

Early debut was measured using the Wave IV item "How old were you the first time you had vaginal intercourse?" We created a dichotomous variable that categorized women as having an early debut if their first vaginal intercourse occurred before the age of 15 (0 = no, 1 = yes).

Contraception at sexual debut or during most recent intercourse was measured using the Wave I survey item, "Did you or your partner use any method of birth control the first [or most recent] time you had sexual intercourse?" A categorical variable was constructed from a combination of responses including 0 = has not had sex [referent], 1 = used either first or most recent time, 2 = did not use either first or most recent time.

Use of drugs or alcohol during sexual debut or most recent intercourse was measured using the Wave I items "The first [or most recent] time you had sexual intercourse, had you been drinking alcohol?" and "The first [or most recent] time you had sexual intercourse, had you been using drugs?" We constructed a categorical variable from a combination of responses including 0 = not intoxicated first or most recent [referent], 1 = intoxicated first time, not most recent, 2 = not intoxicated first time, intoxicated most recent, 3 = intoxicated first time and most recent).

Analytic Approach

We will test our predictions with a series of logistic regression models, one predicting adolescent same-gender sexual behavior and one predicting adult unintended pregnancy. All models adjust for Add Health population weights and stratification by region and primary sample units using the complex survey (svy) command in Stata.

Relevant Covariates

As previously stated, life history theory hypothesizes that early life adversity signals to the developing child that the future is uncertain and life may be short (Brumbach et al., 2009) therefore, in order to be successful in their current environment, they should mature quickly and pursue behaviors that increase their chances of early and frequent reproduction (Del Giudice et al., 2015). Individuals exposed to early harshness and or unpredictability tend to engage in greater sexual risk-taking including but not limited to early

sexual initiation (e.g., Ellis et al., 2003; Hillis et al., 2001; Simpson et al., 2012) and higher numbers of sexual partners (e.g., Hillis et al., 2001; Roemmele & Messman-Moore, 2011; Senn & Carey, 2010). To fully understand how early adversity relates to same-gender behavior and unintended pregnancy, we must measure and account for other traits and behaviors that may augment Pregnancy risk.

Depressive symptoms were measured using the CESD-5 scale at Wave I of data collection. Respondents were asked, "Now think about the past seven days. How often was each of the following things true about the past seven days: (1) you were bothered by things that usually don't bother you; (2) you could not shake off the blues even with help from your family and your friends; (3) you had trouble keeping your mind on what you were doing; (4) you felt depressed; (5) you felt sad?" Possible answers ranged from 0 to 3, with higher scores indicating a higher frequency of experiencing depressive symptoms. We summed responses, and the total scale ranged from 0 to 15.

Openness to experience/intellect/imagination was measured using an Add Health constructed scale variable. Many hypothesize that due to the close association between openness to experience and sensation seeking that openness to experience would be related to sexual risk taking (Hoyle et al., 2000; Turchik et al., 2010). Previous research has found significant associations between openness and greater risk taking (De Vries et al., 2009), while others have found the opposite (Turchik et al., 2010). These findings, along with others, suggest that it is important to examine openness in a model examining predictors of sexual risk taking. This scale consisted of four variables from Wave IV, with responses ranging from Strongly Agree to Strongly Disagree. The four variables were measured using an item that asked respondents "how much do you agree with each statement about you as you generally are now, not as you wish to be in the future?": (1) I have a vivid imagination; (2) I am not interested in abstract ideas; (3) I have difficulty understanding abstract ideas; (4) I do not have a good imagination. Possible answers ranged from 1 "strongly agree" to 5 "strongly disagree" and items were reversed coded when appropriate. The final scale summed responses to each of these questions with values ranging from 4 to 20, with 4 being the least open and 20 being the most open.

Menarche was measured at Wave I using, "How old were you when you had your very first menstrual period?" We constructed a categorical variable where 0 = under 12 [referent], 1 = between 12 and 13, 2 = older than 14, 3 = had not begun menstruating, and 4 = missing.

Results

Descriptive statistics for the sample are presented in Table 1 and zero-order correlations among main study variables are presented in Table 2. As shown in the table, unintended pregnancy was positively correlated with number of male partners ($r = .17$, $p < .001$), early sexual debut ($r = .25$, $p < .001$), and depression ($r = .09$, $p < .001$). Neither harshness nor unpredictability was significantly associated with unintended pregnancy ($r = .10$ for each). Individuals reporting adolescent same-gender sexual behavior had higher numbers of male sexual partners ($r = -.18$, $p < .001$), earlier sexual debut ($r = .17$. $p < .001$), and greater marijuana use ($r = .14$, $p < .001$). With respect to links between early adversity and other risk factors, harshness was associated with early debut ($r = .12$, $p < .001$) and depression ($r = .13$, $p < .001$).

Correlates of adolescent same-gender contact (Table 3). We first predicted adolescent same-gender contact from early harshness and unpredictability, controlling for demographic factors (ethnicity and sexual identity) and relevant covariates (depression, age of menarche, and openness to experience). We found that early harshness, but not unpredictability, was associated with same-gender contact before age 18 (OR = 1.97, 95% CI = 1.09, 1.72). Next, we added the set of risk behavior variables to the model (age at sexual initiation, number of male sexual partners, and marijuana use). As expected, adolescent same-gender contact was significantly associated with an early sexual debut (OR = 2.08, 95% CI = 1.22, 3.55) and number of male partners (OR = 1.05, 95% CI = 1.02, 1.08). This supports our prediction that variance in adolescent same-gender contact that is independent of sexual identity is associated with generalized risk behavior.

We also expected that early adversity would no longer be associated with adolescent same-gender contact after controlling for generalized risk behavior. This was partially supported in the model containing generalized risk behavior; the effect of harshness was reduced to a trend level association (OR = 1.28, 95% CI = 0.99, 1.64), suggesting that risk behavior was partially attributable to the association between early life harshness and adolescent same-gender contact.

Table 4 presents models predicting unintended pregnancy. We first predicted unintended pregnancy from adolescent same-gender contact, controlling for sexual identity, age, ethnicity, and covariates of depression, openness to experience, and menarche. As predicted, we found that adolescent same-gender contact was significantly associated ($p < .05$) with unintended pregnancy (OR = 1.77, 95% CI = 1.07, 2.93). We then added the set of variables representing general risk behavior (early sexual debut, number of male partners, contraceptive use, sex during intoxication, and marijuana use). We found that number of male partners (OR = 1.05, 95% CI = 1.02, 1.08), early sexual debut (OR = 1.47, 95%

Table 1 Descriptive statistics for total sample and by engagement in same-gender sex

Demographics	Total		Has had same-gender Sex		Has not had same-gender Sex		
	n = 5,506		n = 183		n = 5,323		
	%	SD	%	SD	%	SD	p
Race							
White	72.4%		78.2%		72.2%		.162
Black	12.8%		9.0%		14.0%		
Hispanic	9.4%		8.3%		9.4%		
Indian	3.2%		2.5%		2.2%		
Asian	0.6%		2.0%		0.6%		
Other	0.7%		0.4%		0.7%		
Age (mean)	15.8	1.8	15.25	1.6	15.78	1.8	.003
Sexual Identity							
Heterosexual	85.9%		42.7%		87.6%		<.001
Mostly Heterosexual	10.6%		23.5%		10.1%		
Bisexual	2.3%		16.0%		1.8%		
Lesbian	1.2%		17.8%		0.5%		
Dependent Variables							
Unintended Pregnancy	38.1%		45.6%		37.8%		.094
Independent Variables							
Harshness (mean)	0.6	0.8	0.9	0.9	0.1	0.8	.001
Unpredictability (mean)	0.7	0.7	0.8	0.7	0.7	0.7	.156
Risk Factors							
Marijuana Use	23.3%		37.2%		22.76%		.003
Contraceptive Use							
Has Not Had Sex	68.2%		60.4%		68.55%		.073
Used During First or Most Recent Intercourse	25.4%		27.3%		25.35%		
Used Neither Time	6.3%		12.4%		6.10%		
Intoxication During Intercourse							
Not Intoxicated First or Most Recent Intercourse	94.6%		92.6%		94.72%		.332
Intoxicated First Time, Not Most Recent	3.1%		3.7%		3.03%		
Intoxicated Most Recent Time, Not First	1.6%		1.6%		1.72%		
Intoxicated First and Most Recent	0.7%		1.9%		0.65%		
Total Number of Male Partners (mean)	2.27	3.8	5.0	5.9	2.2	3.6	<.001
Early Sexual Debut	15.5%		34.4%		14.7%		<.001
Covariates							
Menarche							
< 12	33.1%		36.0%		33.0%		.907
12–13	53.6%		50.9%		53.7%		
> 14	3.0%		2.6%		3.0%		
Has Not Reached Menarche	10.3%		10.5%		10.3%		
Depression (mean)	3.0	2.9	4.1	3.0	3.0	2.8	.001
Openness (mean)	14.3	2.4	15.1	2.4	14.2	2.4	<.001

Source National Longitudinal Survey of Adolescent to Adult Health

CI = 1.17, 1.86), and not using contraception during the first or most recent intercourse compared to never having sex (OR = 1.80, 95% CI = 1.28, 2.53) were significantly associated with unintended pregnancy, but after adding these risk behaviors to the model, adolescent same-gender contact was no longer associated with unintended pregnancy (OR = 1.41, 95% CI = 0.84, 2.35). Hence, to the extent that adolescent same-gender contact predicts women's adult unintended pregnancy (independent of her sexual identification), this association is partially due to generalized sexual risk behavior.

Finally, we ran two additional models to specifically examine the contribution of early adversity (harshness and unpredictability) to unintended pregnancy and whether this contribution is due to risk behavior. First, we ran a model predicting unintended pregnancy from early life adversity (coded separately as harshness and unpredictability), demographic factors (age, ethnicity, and sexual identity), and relevant covariates (age of menarche, depression, openness to experience). Both harshness (OR = 1.28, 95% CI = 1.16, 1.42) and unpredictability (OR = 1.33, 95% CI = 1.20, 1.47) were significantly associated with unintended pregnancy. Next, we added generalized risk behavior (early sexual debut, number of male partners, contraceptive use, sex during intoxication, and marijuana use, and adolescent same-gender contact to the model. We expected that generalized risk behavior would show significant associations with unintended pregnancy in this full model, but the effects of early adversity would be nonsignificant. This prediction was only partially supported: Contraceptive use, number of male partners, and early sexual debut were significantly associated with unintended pregnancy (as they were in the model which did not include early adversity), but both harshness (OR = 1.24, 95% CI = 1.13, 1.37) and unpredictability (OR = 1.28, 95% CI = 1.16, 1.42) remained significantly associated with unintended pregnancy. Hence, although adolescent same-gender contact does not make an independent contribution to unintended pregnancy after controlling for general risk behavior, early life harshness and unpredictability do make unique contributions to unintended pregnancy independent of general risk behavior.

Discussion

The present study investigated the relative contributions of adolescent same-gender sexual behavior, generalized sexual risk behavior, and early life adversity to unintended pregnancy. Previous research has identified significant associations among these factors, but ours is the first to test a specific theoretical model outlining how and why they should relate to unintended pregnancy. Specifically, we tested a model based on LHT, which proposes that early life adversity leads to the development of a "fast life history strategy" orientated

Table 2 Correlations early adversity, fast life history variables, unintended pregnancy, and same-gender sex before 18 years

	Harshness	Unpredictability	Unintended pregnancy	Same-gender sex before 18	Total number of male partners	Early sexual debut	Openness	Marijuana use	Depression	Age
Harshness										
Unpredictability	0.14 (.000)									
Unintended Pregnancy	0.10 (.000)	0.08 (.000)								
Same-gender Sex Before 18	0.08 (.000)	0.03 (.002)	0.01 (.180)							
Total Number of Male Partners	0.07 (.000)	0.09 (.000)	0.17 (.000)	−0.18 (.000)						
Early Sexual Debut	0.12 (.000)	0.08 (.000)	0.25 (.000)	0.17 (.000)	0.28 (.000)					
Openness	−0.03 (.000)	0.02 (.009)	−0.05 (.000)	0.07 (.000)	−0.02 (.006)	−0.02 (.005)				
Marijuana Use	0.09 (.000)	0.15 (.000)	0.10 (.000)	0.14 (.000)	0.15 (.000)	0.16 (.000)	0.00 (.786)			
Depression	0.13 (.000)	0.12 (.000)	0.09 (.000)	−0.06 (.000)	0.16 (.000)	0.08 (.000)	−0.06 (.000)	0.18 (.000)		
Age	−0.01 (.271)	0.05 (.000)	0.00 (.611)	0.01 (.218)	−0.05 (.000)	−0.04 (.000)	−0.06 (.000)	0.20 (.000)	0.12 (.000)	

OR Odds Ratio, *CI* Confidence Interval

Source National Longitudinal Survey of Adolescent to Adult Health

Table 3 Multinomial analysis of same-gender before age 18 years

	Model 1			Model 2			Model 3			Model 4			Model 5		
	OR	95% CI	p	OR	95% CI	p	OR	95% CI	p	OR	95% CI	p	OR	95% CI	p
Harshness	1.44	(1.15–1.79)	.002				1.44	(1.14–1.80)	.002	1.37	(1.09–1.72)	.008	1.28	(0.99–1.64)	.055
Unpredictability				1.06	(0.77–1.45)	.714	1.00	(0.72–1.39)	.983	0.93	(0.66–1.31)	.670	0.87	(0.64–1.19)	.379
Covariates															
Depression										1.12	(1.04–1.21)	.004	1.10	(1.02–1.18)	.018
Openness										1.10	(1.00–1.20)	.044	1.12	(1.02–1.24)	.018
Menarche (<12)															
12–13										0.80	(0.51–1.25)	.320	0.85	(0.54–1.34)	.482
>14										1.05	(0.20–5.62)	.954	1.50	(0.28–8.04)	.633
Has Not Reached Menarche										0.70	(0.29–1.67)	.415	0.84	(0.34–2.07)	.699
Risk Behaviors															
Total Number of Male Partners													1.05	(1.02–1.08)	.001
Early Sexual Debut													2.08	(1.22–3.55)	.007
Marijuana Use													1.43	(0.84–2.43)	.185
Demographics															
Age	0.79	(0.70–0.90)	<.001	0.79	(0.69–0.89)	<.001	0.79	(0.70–0.90)	<.001	0.74	(0.63–0.88)	<.001	0.73	(0.62–0.87)	<.001
Race (white)															
Black	0.64	(0.33–1.24)	.187	0.74	(0.38–1.42)	.363	0.64	(0.33–1.25)	.190	0.61	(0.31–1.20)	.150	0.62	(0.31–1.24)	.173
Hispanic	0.74	(0.36–1.51)	.408	0.81	(0.39–1.68)	.573	0.74	(0.37–1.51)	.408	0.71	(0.35–1.44)	.344	0.77	(0.38–1.55)	.460
Indian	0.97	(0.21–4.49)	.965	1.07	(0.24–4.82)	.926	0.97	(0.21–4.51)	.965	0.97	(0.22–4.31)	.968	1.25	(0.29–5.46)	.761
Asian	1.47	(0.21–10.23)	.696	1.56	(0.25–9.85)	.634	1.47	(0.21–10.24)	.696	1.20	(0.13–11.39)	.872	1.24	(0.10–14.61)	.865
Other	0.06	(0.01–0.32)	<.001	0.06	(0.01–0.30)	<.001	0.07	(0.01–0.32)	<.001	0.07	(0.01–0.35)	<.001	0.08	(0.02–0.38)	.002
Sexual Identity (Heterosexual)															
Mostly Heterosexual	4.51	(2.77–7.34)	<.001	4.82	(2.93–7.93)	<.001	4.51	(2.78–7.31)	<.001	3.90	(2.34–6.48)	<.001	3.30	(2.02–5.39)	<.001
Bisexual	16.36	(8.46–31.66)	<.001	17.95	(9.42–34.20)	<.001	16.38	(8.42–31.85)	<.001	14.28	(7.11–28.68)	<.001	11.33	(5.46–23.54)	<.001
Gay	77.96	(37.19–163.42)	<.001	80.62	(39.27–165.52)	<.001	78.01	(36.80–165.36)	<.001	76.27	(37.43–155.43)	<.001	85.82	(41.07–178.08)	<.001

OR Odds Ratio, *CI* Confidence Interval, *N*=5,506

Source National Longitudinal Survey of Adolescent to Adult Health

Table 4 Multinomial analysis of unintended pregnancy

	Model 1			Model 2			Model 3			Model 4		
	OR	95% CI	p	OR	95% CI	p	OR	95% CI	p	OR	95% CI	p
Same-gender Sex Before 18	1.77	(1.07–2.93)	.026	1.41	(0.84–2.35)	.192				1.37	(0.83–2.26)	.217
Harshness							1.28	(1.16–1.42)	<.001	1.24	(1.13–1.37)	<.001
Unpredictability							1.33	(1.20–1.47)	<.001	1.28	(1.16–1.42)	<.001
Covariates												
Depression	1.06	(1.03–1.09)	<.001	1.03	(1.00–1.07)	.072	1.04	(1.01–1.07)	.010	1.02	(0.98–1.05)	.324
Openness	0.95	(0.92–0.98)	.003	0.96	(0.93–0.99)	.022	0.95	(0.92–0.98)	.002	0.96	(0.93–0.99)	.015
Menarche (<12)												
12–13	0.89	(0.74–1.02)	.082	0.90	(0.76–1.06)	.198	0.89	(0.76–1.04)	.135	0.92	(0.78–1.08)	.296
>14	0.97	(0.64–1.48)	.888	1.10	(0.67–1.78)	.711	1.00	(0.67–1.49)	.992	1.12	(0.71–1.76)	.617
Has Not Reached Menarche	0.69	(0.51–0.94)	.017	0.77	(0.57–1.04)	.089	0.71	(0.53–0.96)	.028	0.79	(0.89–1.07)	.132
Risk Behaviors												
Total Number of Male Partners				1.05	(1.02–1.08)	.003				1.04	(1.01–1.08)	.006
Early Sexual Debut				1.47	(1.17–1.86)	.001				1.45	(1.14–1.85)	.003
Marijuana Use				1.21	(0.98–1.50)	.082				1.15	(0.93–1.42)	.186
Contraceptive Use (Has Not Had Sex)												
Used During First or Most Recent Intercourse				1.56	(1.23–1.97)	<.001				1.56	(1.24–1.96)	<.001
Used Neither Time				1.80	(1.28–2.53)	.001				1.79	(1.26–2.55)	.001
Intoxication During Sex (Not Intoxicated First or Most Recent Intercourse)												
Intoxicated First Time, Not Most Recent				1.00	(0.63–1.58)	.999				1.03	(0.66–1.61)	.903
Intoxicated Most Recent, Not First				1.42	(0.66–3.08)	.367				1.51	(0.67–3.41)	.319

Table 4 (continued)

	Model 1			Model 2			Model 3			Model 4		
	OR	95% CI	p	OR	95% CI	p	OR	95% CI	p	OR	95% CI	p
Intoxicated First and Most Recent				0.82	(0.37–1.81)	.617				0.88	(0.38–2.06)	.772
Demographics												
Age	1.04	(0.99–1.09)	.103	0.98	(0.93–1.03)	.415	1.04	(0.99–1.09)	.126	0.98	(0.94–1.03)	.460
Race (white)												
Black	2.69	(2.11–3.44)	<.001	2.64	(2.06–3.40)	<.001	2.45	(1.91–3.15)	<.001	2.45	(1.90–3.15)	<.001
Hispanic	1.15	(0.84–1.57)	.371	1.25	(0.92–1.70)	.147	1.07	(0.78–1.47)	.666	1.18	(0.86–1.61)	.312
Indian	1.03	(0.70–1.50)	.896	1.22	(0.84–1.76)	.298	0.99	(0.67–1.46)	.959	1.17	(0.80–1.70)	.406
Asian	1.26	(0.53–3.00)	.592	1.40	(0.60–3.25)	.433	1.25	(0.51–3.06)	.618	1.37	(0.57–3.26)	.472
Other	1.35	(0.56–3.22)	.503	1.50	(0.64–3.54)	.348	1.27	(0.52–3.14)	.595	1.45	(0.59–3.55)	.412
Sexual Identity (Heterosexual)												
Mostly Heterosexual	1.26	(0.98–1.63)	.072	1.10	(0.85–1.43)	.448	1.23	(0.96–1.58)	.102	1.07	(0.83–1.37)	.622
Bisexual	0.98	(0.57–1.68)	.948	0.77	(0.44–1.37)	.375	1.01	(0.60–1.68)	.984	0.72	(0.41–1.26)	.253
Gay	0.24	(0.08–0.67)	.007	0.24	(0.08–0.67)	.007	0.29	(0.13–0.66)	.003	0.22	(0.08–0.58)	.003

OR Odds Ratio, *CI* Confidence Interval, *N* = 5,506

Source National Longitudinal Survey of Adolescent to Adult Health

toward risk, characterized by a range of sexual risk behaviors, including adolescent same-gender contact. These risk behaviors, in turn, facilitate adult unintended pregnancy. A key prediction of our hypothetical model was that adolescent same-gender contact should not be independently associated with either early adversity or unintended pregnancy. Rather, its association with both of these variables should be due to its relationship with general sexual risk factors.

This was exactly what we found. With respect to adolescent same-gender contact, we found that the women reporting this contact were (not surprisingly) more likely to identify as lesbian or bisexual as adults. But we found that independent of sexual identity, adolescent same-gender contact was also associated with early life harshness (e.g., abuse, poverty), although not early life unpredictability. This suggests that variance in same-gender behavior that is independent of a woman's sexual identity (i.e., participating in a level of same-gender behavior that is higher than one would expect based on one's eventual identification as lesbian or bisexual) is related to that woman's exposure to harsh childhood environments. We proposed that this linkage reflects the fact that early harshness increases a woman's tolerance for all sexual risks–risks for pregnancy and disease as well as risks for social stigmatization. From a life history framework, same-gender sexual behavior is just as "risky" as unprotected penile-vaginal coitus–it is simply a different type of risk. If early life adversity augments a young person's orientation toward risk and short-term gratification, then we would expect to find that the link between early life adversity and adolescent same-gender contact is partially due to generalized risk taking. This was what we found: After accounting for generalized risk behaviors such as having multiple sexual partners, early sexual debut, poor contraceptive use, and substance use, early life harshness was no longer significantly associated with adolescent same-gender contact.

These findings suggest that previously documented links between adolescent same-gender contact and unintended pregnancy are actually attributable to the connection between adolescent same-gender contact and generalized risk behavior. When we predicted unintended pregnancy from adolescent same-gender contact (controlling for sexual identity and other demographics), it was initially a significant predictor, but its effect was no longer significant after adding generalized risk behavior to the model. This supports our contention that adolescent same-gender contact can be conceptualized as a part of a suite of "fast life history" risk behaviors fostered by early life adversity, increasing the adult likelihood of unintended pregnancy.

One of our predictions, however, was not confirmed: We expected that early life harshness and unpredictability would no longer make unique contributions to unintended pregnancy after accounting for generalized risk behavior, and this was not the case. We had expected that "fast life history

strategy" risk behaviors represented the primary pathway through which early life adversity augmented pregnancy risk. Yet, our final model showed that even after controlling for risk behavior, early life harshness and unpredictability continued to make unique contributions to unintended pregnancy. Hence, although "fast life history strategy" behaviors such as early sexual debut, multiple sexual partners, and poor contraceptive use remain one of the routes through which early life adversity augments the likelihood of unintended pregnancy, it is not the only route. Some women engage in sexual risk behaviors (and face risks for unintended pregnancy) without having experienced early adversity, and some women with early adversity will show heightened risks for unintended pregnancy even without engaging in generalized risk behavior. Identifying the dynamics and mechanisms underlying these additional pathways is a critical direction for future research. For example, one possibility is that women exposed to early harshness or unpredictability may pursue different decisions about sexual behavior even within long-standing, monogamous relationships. A range of different psychological dynamics might underlie associations between early adversity and adult reproductive outcomes, and these diverse dynamics require substantive attention by research aiming to develop health-promoting interventions.

Another direction for future research involves understanding why and how early life adversity leads to a fast life history strategy oriented toward risk. What exactly, if any, is the psychological mechanism involved? One possibility is that women who experience early adversity may be particularly sensitive to opportunities for rewards and, more specifically, sexual rewards (Alley & Diamond, 2021; Diamond & Alley, 2019) In essence, this theory hypothesizes that women exposed to early adversity, both harsh and unpredictable, may have a neurobiological motivation to seek out and engage in particularly rewarding activities (such as sexual behavior and substance), despite their associated risks. Hence, what appears to be "heightened risk-tolerance" might actually reflect "heightened reward-sensitivity." In other words, it may be the total perceived tradeoff between risk and reward for a particular behavior that matters, and not simply perceptions of risk. If sexual behaviors such as condomless sex or same-gender sexual behavior were not perceived as rewarding, then their riskiness might be sufficient to keep people from pursuing them. Hence, in the same way that life history theory calls our attention to overall tradeoffs between investment in short-term versus long-term goals, it also calls our attention to the specific tradeoffs between risk and reward across sexual different sexual behaviors. From this perspective, behaviors that otherwise seem quite different from one another (such as same-gender sexual contact and condomless penile-vaginal coitus) might actually be quite similar on the basis of their risk/reward ratio. Hence, applying a life history perspective to phenomena such as unintended pregnancy can help us

identify a broader range of predictors for this outcome, and can therefore guide attempts to identify evidence-based strategies for reducing its occurrence.

Importantly, devoting greater attention to the total risk/reward tradeoff for specific sexual behaviors requires that we assess a broader range of sexual risks and sexual rewards than has been done previously. As noted earlier, research on "sexual risk" has devoted more attention to physical health risks such as pregnancy and infection than to mental health risks such as social isolation or rejection, and we need greater attention to these types of risks. Similarly, we need greater attention to a broader range of sexual rewards than just physical gratification. For instance, sexual behavior can also provide rewards such as increased social status and intimacy (Armstrong & Reissing, 2015; Goldey et al., 2016; Rye & Meaney, 2007; Zabin et al., 2000). We need to take all of these rewards into account when trying to predict participation in specific sexual acts, such as condomless penile-vaginal intercourse. Women who pursue high levels of this behavior might do so because they are not troubled by risks for pregnancy and infection, but they might *also* do so because they view the rewards of this behavior to be worth the risk. For example, research indicates that both men and women describe condomless penile-vaginal coitus to provide greater physical pleasure and enjoyment Brown et al., 2008, Catania et al., 1989; Hingson et al., 1990, Randolph et al., 2007). Although Randolph et al. (2007) point out that condoms are generally viewed more negatively (with respect to their reduction of physical pleasure) by men than by women, this does not mean that women do not take their *own* pleasure into account when making decisions about condom use. Research has increasingly shown that women's decisions about sexual behavior are strongly related to their expectations whether these behaviors will be pleasurable, especially for sexual behavior pursued outside of a committed relationship (Armstrong & Reissing, 2015; Garcia & Reiber, 2008).

Accordingly, women's basic human motivation to pursue sexual pleasure, in concert with all women's relatively broad capacity to find both same-gender and other-gender sexual contact arousing and physically rewarding (Chivers & Timmers, 2012; Chivers et al., 2007; Frederick et al., 2018; Garcia et al., 2014) suggests that we need to attend to a broad range of sexual behaviors in order to differentiate between women who are more "reward-focused" in their sexual behavior from women who are more "risk-averse." If women exposed to early adversity are more sensitive to sexual reward than sexual risk, then they should be disproportionately likely to pursue any behavior that is both highly rewarding and highly risky, including same-gender behavior. The specific consequences of each behavior will differ, but they might all be "traceable" to woman's perception of their risk/reward tradeoff. In making this claim, we are specifically focusing on same-gender behavior, rather than same-gender

attractions. We do not propose that adversity alters one's desires for same-gender partners, but only the likelihood of acting on those desires (along with any other desires that combine high risk with high reward). Hence, future research on the predictors of unintended pregnancy (and other sexual health risks) should adopt a broader frame when trying to identify the types of sexual-developmental trajectories that signal a heightened likelihood of these outcomes.

While the present study has many strengths it also has a few limitations. First, there are many restrictions to our measures and sample because we are using secondary data. While the ADD health data set is widely used and extremely important, it is not tailored to our specific needs. Therefore, we were restricted in what variables we could use to address our life history theory-related questions. Such as, our measures of early adversity, although valid, do not encompass all of the variables hypothesized to be important to life history theory. Additionally, because of restraints in our measures of adversity, we used a neglect measure from Wave III in our harshness scale. Wave III of the Add Health survey had a particularly low response rate, limiting our sample size to that of the smaller Wave III. This is due to a bias in follow-up and Wave III and not a bias in the neglect measure itself.

We were also limited on the variables we could include in our model predicting same-gender contact before the age of 18 because of time ordering issues. Contraceptive use and use of drugs or alcohol during sex (two major risk factors) could have occurred after the first same-gender sexual experience, in which case we could not use them as a predictor. Further, another restriction of the data set is that the questions used to address sexual abuse only ask about perpetration from a parent or other adult. This limitation is important to point out given that many folks who are sexually assaulted in childhood, especially women, have a high chance of being revictimized later in life by not only family but also romantic partners (Smith et al., 2003). Further this lack of information on dating violence is a serious lack when examining adolescents who engage in same-gender sexual behavior. Specifically, Martin-Storey (2015) found that sexually diverse youth were significantly more likely to experience dating violence than heterosexual youth. These findings point out that the measure we use to address sexual abuse may not capture the full range of abuse experiences of our sample. Future research addressing similar questions should consider and examine a wider range of abuse experiences including peer and romantic partner victimization.

Another limitation of the current data set is the lack of physiological data. While LHT is often focused on behavioral outcomes some have identified the importance of examining hormones such as oxytocin and cortisol in LH related processes (e.g., Del Giudice et al., 2011). Given that oxytocin is integral to sexual behavior and pregnancy, future research should consider examining the potential influence

of oxytocin in the association between sexual risk taking and pregnancy outcomes.

Conclusion

In conclusion the present research provides insight into the unique contributions that early adversity, generalized risk taking, and same-gender sexual behavior make to a woman's adult risk of unintended pregnancy. Our findings suggest that the seemingly paradoxical association between adolescent same-gender behavior and adult unintended pregnancy is attributable to the fact that adolescent same-gender behavior serves as a "marker" of a woman's willingness to tolerate psychological and physical risks (such as social rejection and pregnancy) in the pursuit of sexual rewards. The same women who are willing to tolerate the risks associated with same-gender behavior (such as social rejection) are also willing to tolerate the risks associated with condomless penile-vaginal intercourse (such as pregnancy). Hence adopting a life history perspective on unintended pregnancy broadens our perspective on the full range of "risky" behaviors that might eventually predict this outcome and helps us to better understand the full suite of motives shaping individuals' sexual behavior, and how these motives are shaped by early childhood experiences such as adversity.

Declarations

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