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## Positive, Negative, or Mixed Feelings? A Person-Centered Approach to Consequences of First Penile-Vaginal Intercourse in College Students

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### Abstract

Many adolescents and young adults have mixed feelings about their experience of first vaginal intercourse, experiencing both positive consequences like physical satisfaction and love, as well as negative consequences like guilt and anxiety. However, no study has examined the patterns of consequences individuals experience after first vaginal intercourse, which can provide a more nuanced sense of young adults' feelings. We used latent class analysis to examine consequences of first vaginal intercourse in a longitudinal study of college students in the Northeastern United States ( $N=191$ ; 45.6% female, 30.9% White/European American, 23.6% Asian American/Pacific Islander, 22.5% Hispanic/Latino, 14.7% Black/African American, 8.4% multiracial). For male college students, classes included Multidimensional Positive (49.4%), Intimacy and Satisfaction (4.39%), and Guilt and Regret (16.22%). For female college students, classes included Intimacy, Satisfaction, and Pain (40.84%), Primarily Negative (31.11%), and Mixed Feelings (20.86%). For male students, age at first vaginal intercourse, first intercourse with a non-relationship partner, religiosity, and non-use of contraceptives were associated with class membership; for female students, first intercourse with a non-relationship partner was associated with being in classes marked by multiple negative consequences. Findings differ by gender and are partially in line with the sexual double standard, but provide a more nuanced picture, with the majority of both male and female college students likely to report positive consequences, specifically intimacy and physical satisfaction.

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#### DECLARATIONS

Ethical approval. This study received institution review board approval, and all procedures involving human participants were in accordance with the ethical standards of the institutional research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Informed consent. Informed consent was obtained from all individual participants included in the study.

Conflicts of Interest. The authors have no conflicts of interest to disclose.

Availability of data and materials. The data that support the findings of this study is not publicly available, as participants did not consent for their data to be shared publicly.

Code availability. This study uses PROCS LCA software that is publicly available at <https://www.methodology.psu.edu/downloads/procalta/>

## Keywords

first sexual intercourse; consequences of sex; latent class analysis

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## INTRODUCTION

Individuals' reactions to first vaginal intercourse may have implications for their sexual functioning (Rapsey, 2014; Reissing et al., 2012; Smith & Shaffer, 2013), adjustment, and satisfaction (Moore & Davidson, 1997). Although research on first vaginal intercourse has generally moved beyond framing the experience exclusively in terms of risk, many researchers continue to view the event as a binary positive or negative experience, without acknowledgement of the complexity of feelings about sexual experiences (Reissing et al., 2012; Schwartz & Coffield, 2020; Tolman & McClelland, 2011). Even research that examines a wider variety of reactions to first vaginal intercourse typically focuses on the frequency of such outcomes and how they differ by gender. However, looking at each consequence separately may obscure overall patterns, which may be marked by both positive and negative consequences. For example, first vaginal intercourse may have different implications for future sexual behavior and mental health depending on whether consequences are positive, negative, or a mix of both. In the current study, we use a person-centered approach to explore patterns of positive and negative intrapersonal and interpersonal consequences of first vaginal intercourse among college students who initiated first vaginal intercourse during college, as well as how those patterns differ by gender and other personal and contextual factors.

### Consequences of First Vaginal Intercourse

This study draws from two primary theoretical/conceptual perspectives: the normative developmental perspective and the motivational perspective. The normative developmental perspective on sexual behavior emphasizes that engaging in sexual behavior is normative for adolescents and thus researchers should consider sexuality more broadly than abstinence, sexually transmitted infections, and unintended pregnancy, including how individuals experience sexual behaviors (Harden, 2014; Tolman & McClelland, 2011; Vasilenko et al., 2014). From such a perspective first vaginal intercourse is a normative experience that does not inherently lead to negative outcomes, although negative consequences may result from particular contextual factors, such as partner type and contraceptive use (Harden, 2014; Tolman & McClelland, 2011; Vasilenko et al., 2014). Although some research has considered perceptions of first sexual intercourse, most of this research has either surveyed adolescents, or has asked college students to retrospectively report on their first intercourse experience that occurred earlier. However, individuals who initiate later, such as during college, may experience different consequences, as individuals who delay sex generally engage in less risky behaviors and may have different motivations for engaging in or delaying sex (Forste & Haas, 2002). In addition, because sexual behavior during college is common, individuals who initiate in late adolescence are off-time compared to their peers, and may feel a positive sense of relief compared to individuals who initiate earlier in adolescence (Vasilenko, 2021).

The motivational or functional perspective on adolescent sexual behavior (Cooper et al., 1998) posits that individuals engage in sexual behavior for different reasons due to the functions such behaviors serve for them. These motivations includes both approach motivations which make individuals more motivated to engage in sexual behavior, or avoidance motivations, which make individuals less likely to engage in sexual behavior. In addition, sexual behavior may serve both self-focused and other-focused functions. Drawing from this perspective, researchers have examined the consequences of sex individuals may experience that draw from these functions of sex (Márvan et al., 2018; Vasilenko et al., 2016; 2012). Specifically, intrapersonal consequences are self-focused and encompass both positive and negative psychological and physiological consequences. In contrast, interpersonal consequences are typically other-focused, such as positive or negative consequences relating to one's partner or peers (Vasilenko et al., 2012). Experiencing these consequences may influences individuals' motivations for sex, and subsequently their later sexual behavior. Thus, we examine intrapersonal and interpersonal positive and negative consequences of first vaginal intercourse among college students who initiated during college.

In the following sections, we review literature on positive and negative intrapersonal and interpersonal consequences. When possible, we focus on studies of young adults rather than adolescents. However, when the only available studies focus on adolescents or retrospective reports from college students, we include research that focuses on adolescents.

**Intrapersonal Consequences**—Emotions and physical satisfaction are the two most researched categories of intrapersonal consequences. Adolescents and college students commonly report both positive and negative emotions following first vaginal intercourse, including excitement, happiness, feeling good or great, and feeling better or cheered up or physically satisfied, but also anxiety, regret, guilt, and fear (Higgins et al., 2010; Marván et al., 2018; Reissing et al., 2012; Schwartz & Coffield, 2020; Vasilenko et al., 2015; 2016). Middle school and high school students also report worrying about pregnancy, STDs, and HIV, and that their parents might find out (Vasilenko et al., 2016).

**Interpersonal Consequences**—Research exploring the interpersonal consequences of first vaginal intercourse is sparse compared to research on intrapersonal consequences (Vasilenko et al., 2012), but several researchers have examined the impact of first intercourse on individuals' relationship with their partner and peer reputation (Kreager et al., 2016; Martino et al., 2009; Marván et al., 2018; Smiler et al., 2005; Vasilenko et al., 2016). Research generally shows that both positive and negative interpersonal consequences are common (Vasilenko et al., 2016). Specifically, adolescents and college students report feeling closer to and a high level of love toward their partner after sex and, to a lesser extent, that they avoided angering their partner by having sex (Smiler et al., 2005; Vasilenko et al., 2016). However, adolescents also report feeling they moved too fast and worrying their partner may want more commitment or that another partner will find out (Martino et al., 2009; Vasilenko et al., 2016)

**Gender Differences**—Research has found gender differences in consequences of first vaginal intercourse, likely due to the sexual double standard, or the belief that sexual

behavior is more acceptable for men than women (Bordini & Sperb, 2013; Crawford & Popp, 2003). Recent research has suggested a loosening of the sexual double standard, including more acceptance of premarital and casual sex for both genders (Bordini & Sperb, 2013; González-Marugán et al., 2021) and the possible existence of different double standards, in which men judge women's behavior more harshly and women are more critical of men's behaviors (Hensums, et al., 2020). However, recent research still suggests gender differences in acceptability and these differences may be particularly strong for specific aspects of sexual behavior, like first intercourse (Bordini & Sperb, 2013; González-Marugán et al., 2021). One reason for double standards associated with first intercourse may be different views on the meaning of first intercourse. For example, male adolescents are more likely to view virginity as a stigma to be removed, whereas female adolescents see it more as a precious gift to bestow on their partner (Carpenter 2002).

**Gender Differences in Intrapersonal Consequences.:** Research demonstrates gender differences consistent with the sexual double standard in experiencing intrapersonal consequences of first intercourse. Male college students are more likely to report positive emotional reactions, including psychological satisfaction, feeling happy or excited, describing the experience as fun, and feeling relaxed, confident, proud, relieved, or empowered, than female students (Higgins et al., 2010; Reissing et al., 2012; Schwartz & Coffield, 2020; Smiler et al., 2005; Smith & Schaffer, 2013; Vasilenko et al., 2015). In contrast, female adolescents and college students report more negative consequences, such as anxiety, confusion, disappointment, fear, guilt, and regret, as well as worrying their parents would find out (Higgins et al., 2010; Reissing et al., 2012; Schwartz & Coffield, 2020; Smith & Schaffer, 2013; Wight et al., 2008; Woody et al., 2003). However, research has suggested that female college students are experiencing less guilt about first intercourse over time, although they still report more guilt than male college students (Sprecher, 2014).

Regarding physical satisfaction, male college students are more likely than female students to report physical satisfaction and pleasure after first vaginal intercourse (Higgins et al., 2010; Reissing et al., 2012; Tsui & Nicoladis, 2004; Walsh et al., 2011; Woody et al., 2003). This discrepancy is likely due to the fact that male college students are more than six times as likely as female students to achieve orgasm during first vaginal intercourse (Reissing et al., 2012; Schwartz & Coffield, 2020; Tsui & Nicoladis, 2004). Conversely, female college students are more likely to report pain as a result of first vaginal intercourse (Tsui & Nicoladis, 2004; Walsh et al., 2011).

**Gender Differences in Interpersonal Consequences.:** Gender differences in the experience of interpersonal consequences also generally align with the sexual double standard. Female college students are more likely to describe the experience as loving or report feeling closer to their partner compared to male students (Smiler et al., 2005). Male adolescents are more likely than female adolescents to believe their reputation has been enhanced or to gain friendships as a result of first vaginal intercourse, whereas female adolescents are more likely to worry their reputation was harmed or to lose friendships (Kreager et al., 2016; Marván et al., 2018; Vasilenko et al., 2016).

## A Person-Centered Approach to Consequences of First Vaginal Intercourse

Prior research on first vaginal intercourse has contributed to our knowledge about both positive and negative consequences. Although many studies include a wide range of potential consequences, they typically use a variable-centered approach, examining each individual consequence separately and reporting its relative frequency. This approach makes it difficult to determine the extent to which individuals experience multiple consequences simultaneously, and thus to fully capture how they experience first vaginal intercourse. For example, although female college students frequently report both positive and negative consequences (e.g., Higgins et al., 2010; Reissing et al., 2012; Smith & Schaffer, 2013; Tsui & Nicoladis, 2004; Walsh et al., 2011), a traditional variable-centered approach would not characterize patterns of consequences. In contrast, person-centered approaches help to uncover specific patterns that occur within a population (von Eye, 2003). For example, person-centered approaches could uncover classes marked by only positive consequences, only negative consequences, or classes with unique patterns of both positive and negative consequences. This more holistic picture of the consequences of first intercourse is important in understanding the totality of the experience and how it may be associated with future well-being and sexual functioning, as experiencing only positive consequences may lead to different outcome than experiencing positive along with negative consequences. In the current paper, we use a person-centered approach to examine profiles marked by the occurrence of different consequences of first vaginal intercourse.

### Personal and Contextual Factors and Consequences of First Vaginal Intercourse

**Age**—Roughly two-thirds of adolescents engaging in vaginal intercourse by age 18 (Guttmacher Institute, 2019); thus, initiating vaginal intercourse during late adolescence is relatively normative. Early initiation is more strongly associated with negative reactions, such as regret, for female compared to male adolescents (Schwartz & Coffield, 2020; Reissing et al., 2012; Sprecher et al., 2022; Walsh et al., 2011; Wight et al., 2008), as individuals are engaging in a behavior that few of their peers have and may not be developmentally ready for. However, individuals who initiate in late adolescence may feel more positive due to a sense of relief initiating a normative behavior (Vasilenko, 2021). Research has demonstrated that individuals who initiate vaginal intercourse during late adolescence or college are more likely to describe the experience as positive, feel better or more attractive after sex, and be physiologically satisfied compared to individuals who initiate earlier (Higgins et al., 2010; Walsh et al., 2011).

**Religiosity**—Because religious institutions tend to condemn premarital sex, unmarried young adults with strongly held religious beliefs may be more likely to experience negative consequences of first vaginal intercourse, such as regret. Adolescents who are more religious are less likely to experience physical satisfaction and more likely to experience regret, worry their parents would find out, and feel they went against their morals or ethics (Marván et al., 2018; Wight et al., 2008) compared to their less religious peers.

**Type of Sexual Partner**—Given cultural and societal expectations that vaginal intercourse is for committed or marital relationships, partner type may buffer the potential negative effects of first vaginal intercourse (Harden, 2014). First vaginal intercourse with

a non-dating partner is associated with fewer positive and more negative consequences (Reissing et al., 2012; Schwartz & Coffield, 2020; Wight et al., 2008), although other research found no associations (Woody et al., 2003). The experience of negative consequences after first vaginal intercourse with a non-dating partner may differ for men and women due to the sexual double standard, with women judged more harshly and experiencing more negative consequences for casual sex than men (Vasilenko et al., 2012).

**Contraceptive Use**—Use of contraceptives has been theorized as a predictor of consequences of sexual behavior, as non-use may lead individuals to worry more (Vasilenko et al., 2012, 2014). Research in this area has been mixed, with some evidence that college students who did not use contraceptives during first vaginal intercourse were more likely than students who did to describe it as a negative experience (Moore & Davidson, 1997; Smiler et al., 2005). Using contraceptives during first vaginal intercourse is associated with female college students feeling empowered, and using contraceptives was associated with male college students feeling love (Smiler et al., 2005). Other research demonstrates no differences in psychological satisfaction as a result of contraceptive use (Higgins et al., 2010).

### The Current Study

In the current study we use both variable-centered and person-centered approaches to examine the consequences of first vaginal intercourse and build on prior research in several ways. First, we use a person-centered approach to examine frequencies and patterns of particular consequences, which allows us to create a more complex, holistic picture of first vaginal intercourse. Second, most prior studies have been retrospective in nature, with the time between first vaginal intercourse and participants' reports ranging from just over one year (Vasilenko et al., 2016) to up to four years (Reissing et al., 2012). In the current study we use longitudinal data collected within six months of college students' first vaginal intercourse experience, which may reduce possible biases related to changes in relationship with a partner (Smiler et al., 2005; Sprecher et al., 1995; Vasilenko et al., 2015). In addition, much of the research that collects data closer to the event is conducted with younger adolescents, for whom sexual behavior may be non-normative and thus more negative. Thus, this study provides information on young adults who initiated vaginal intercourse during college, allowing us to consider whether it is a primarily positive experience in a context where sexual behavior is normative (Lefkowitz, 2005).

Building on prior research and past finding, we have three aims:

Aim 1: To examine frequencies of and gender differences in experiencing positive and negative intrapersonal and interpersonal consequences of first vaginal intercourse in a sample of young adults who initiated vaginal intercourse during college. We expect that both positive and negative consequences will be common, and that female college students will experience more negative and fewer positive consequences than male college students.

Aim 2: To use latent class analysis (LCA; Collins & Lanza, 2010) to uncover profiles of these consequences for male and female college students. Due to the



exploratory nature of LCA, we make no specific predictions about the existence of particular classes. However, we expect classes marked by primarily positive, primarily negative, and mixed consequences, and that male college students will be more likely than female college students to be in primarily positive classes.

Aim 3: To better understand these classes by examining correlates of membership in these classes of consequences. We expect that younger age, greater religiosity, first intercourse with a non-relationship partner, and non-use of condoms or any contraception will be associated with classes of more negative or mixed consequences compared to classes marked by positive consequences.

## METHOD

### Participants

Participants were from the University Life Study (ULS; Patrick et al., 2015), a four-year (2007–2011) longitudinal study of college students at a large university in the Northeastern United States recruited during their first semester of college. We used a stratified random sampling procedure with replacement. In total, 744 students participated in the baseline survey (65.6% response rate). Our analytic sample included 191 students who reported never having engaged in vaginal intercourse at baseline (fall of first year of college) and subsequently reported engaging in first vaginal intercourse during the course of the study (45.6% female, 30.9% White/European American, 23.6% Asian American/Pacific Islander, 22.5% Hispanic/Latino, 14.7% Black/African American, 8.4% multiracial; 98.4% heterosexual; *M*age at first vaginal intercourse = 20.0, *SD* = 1.0). Note that although this study focuses on heterosexual behaviors, we included individuals who identified as gay or lesbian, as sexual identity and behaviors may differ and sexual minority adolescents frequently engage in vaginal sex (Diamond 2002; Saewyc et al., 2008).

### Procedure

Participants completed a web-based survey each semester, starting the fall of their first year (fall 2007; W1), for seven consecutive semesters (through fall 2010; W7). Each participant received an email containing a secure link to the study and received \$20-\$40 for completion of each survey, depending on the semester.

### Measures

We assessed religiosity at W1. We assessed consequences and situational correlates for a given individual in the semester (2–7) when they reported first vaginal intercourse.

**Experienced Consequences of First Vaginal Intercourse**—Each semester, participants who had not previously reported vaginal intercourse were asked whether they had ever engaged in vaginal intercourse (“sex in which the penis penetrates the vagina”). If they replied yes, they rated whether they had experienced each of 19 consequences of sex (Vasilenko et al., 2012). These items included measures of four positive intrapersonal (e.g., “Feel physically satisfied”), eight negative intrapersonal (e.g., “Not enjoy it”), three positive interpersonal (e.g., “Feel intimate or closer to partner”), and four negative

interpersonal consequences (e.g., “Worry your partner wants more commitment”). This measure was designed as a count assessing whether participants experienced a broad range of consequences of sex that have been reported in prior research. Thus, individual items are independent from each other and are not expected to function as a scale with internal consistency, and positive and negative consequences cannot be compared directly. A full list of the items is in Tables 1 and 2.

### Correlates of Class Membership

**Religiosity:** We included two measures of religiosity, measured at Semester 1 (S1), as covariates, to assess both public and private religiosity (Vasilenko & Espinosa-Hernández, 2019). We assessed participants’ frequency of religious service attendance with the question “How many times have you attended religious services during the past 12 months (52 weeks)?” To compare participants who attended religious services frequently to participants who did not, we dichotomized responses to indicate whether students attended twice a month or more (35.9%) or less than once a month, consistent with prior research on religiosity and sexual behavior (Vasilenko & Espinosa-Hernández, 2019). To assess the importance of religion in daily life, participants completed a 7-item measure (Rohrbaugh & Jessor, 1975). Each item had four or five response choices. Each response choice was assigned a numerical value, ranging from 0 to either 3 or 4, and we created a sum score (possible range = 0–25) with higher scores indicating more importance of religion ( $M = 13.1$ ,  $SD = 7.0$ ).

**Situational Factors at First Vaginal Intercourse:** We assessed *age* at semester of first vaginal intercourse by creating a variable indicating age at the time of the survey when they first reported vaginal intercourse ( $M = 20.0$ ,  $SD = 1.0$ , range 18–23). Of those who reported first intercourse during the study, nearly half (47%) reported first intercourse by their 3<sup>rd</sup> semester survey. To indicate a non-relationship partner, participants reported on their relationship with their first vaginal intercourse partner. Responses to seven options were recoded into a dichotomous variable where 0 = dating partner (engaged or married, living with, regular dating partner; 48.2%) and 1 = non-dating partner (stranger, friend or casual dating partner; 51.8%). Non-use of condom indicates whether the participant used a condom at first vaginal intercourse (19.4% reported condom non-use). Non-use of contraception indicates whether the participant used any form of contraception at first vaginal intercourse (14.5% reported no contraception). Note that we included measures of both condom any contraception use as consequences may differ based on whether individuals used a method that could protect against STIs versus only pregnancy.

### Analytic Plan

Our analysis proceeded in three steps. First, to test Aim 1, in which we predicted gender differences in individual consequences of first vaginal intercourse, we calculated frequencies of each consequence for the whole sample and stratified by gender, performing chi-square tests to indicate gender differences in experiencing each consequence. Second, for Aim 2 examining patterns of consequences experienced, we ran LCA in PROC LCA (Lanza et al., 2007) on the 19 experienced consequences of first vaginal intercourse. LCA is a person-centered method that uncovers latent subgroups of individuals based on their responses



on multiple categorical indicators. Because of the well-documented gender differences in consequences of first vaginal intercourse, we ran analyses stratified by gender, which allowed us to freely estimate different patterns for male and female participants. Third, we examined associations between covariates of class membership separately for male and female students by using the covariates option in PROC LCA, a model-based approach that implements a multinomial regression model predicting membership in a given class relative to a reference group.

## RESULTS

Table 1 presents frequencies and gender differences in intrapersonal consequences (Aim 1). The distribution of consequences was not independent of gender for 2 individual intrapersonal positive consequences, 5 specific intrapersonal negative consequences, and experiencing any intrapersonal negative consequence. Male students were overrepresented among those who reported feeling physically satisfied and feeling better or cheered up. In contrast, female students were overrepresented among those who reported any negative intrapersonal consequence, with 84% of female students reporting at least one negative consequence, compared to 55% of male students. Specifically, female students were overrepresented among those who reported discomfort or pain, worry about pregnancy or a parent finding out, wish they had not had sex, and not to enjoy the experience. Table 2 presents frequencies of interpersonal consequences by gender. The distribution of consequences differed by gender for one positive interpersonal and two negative interpersonal consequences. Male students were overrepresented among those who reported feeling they enhanced their reputation (39% of male students and 5% of female students). For negative interpersonal consequences, male students were overrepresented among those worrying that their partner would want more commitment and that another partner might find out.

Second, we conducted LCAs, stratified by gender (Aim 2). We selected models for male and female students based on fit statistics (AIC and BIC; see Table 3) and interpretability. For males, BIC selected the 3-class model and AIC selected the 5-class model. For females, BIC selected the 3-class model and AIC selected the 5-class model. Thus, we considered the 3, 4, and 5-class models for male students and the 2, 3, 4, and 5-class models for female students. We selected a model in these ranges by interpretability, how conceptually different classes within each model were from each other. We also considered class size; in particular, we wanted a model with more than 10% of participants in order to avoid having a very small number of people in each class (Nylund-Gibson & Choi, 2018). For both groups, we selected the three-class model based on these criteria.

Table 4 presents item-response probabilities for male and female students. For male students, the largest class (49.3%), termed Multidimensional Positive, consisted of students who had high probabilities of reporting nearly all of the intrapersonal and interpersonal positive consequences. The Intimacy and Satisfaction class (34.4%) consisted of male students with a high probability of reporting physical satisfaction and intimacy with a partner. Finally, the Guilt and Regret class (16.2%) consisted of male students who were likely to report two negative intrapersonal consequences and one negative interpersonal

consequence: that they felt they went against their morals or ethics, wished they had not had sex and that they felt things moved to fast.

For female students, the largest class, termed Intimacy and Satisfaction with Pain (48.0%), consisted of students who were likely to report the positive intrapersonal consequences of physical satisfaction and feeling a thrill or rush, and the positive interpersonal consequences of feeling intimate or closer to their partner, as well as the negative intrapersonal consequence of experiencing pain or discomfort. The Multidimensional Negative class (31.1%), was marked by a high probability of reporting several negative intrapersonal consequences, including worry about pregnancy, experiencing discomfort or pain, and wishing they had not had sex, as well as the negative interpersonal consequence of feeling things moved too fast. Finally, the Mixed Feelings class (20.9%), consisted of female students who reported positive intra- and interpersonal consequences like physical satisfaction and intimacy, but also negative intrapersonal consequences, including worrying about pregnancy, experiencing pain, feeling they went against their morals or ethics, and wishing they had not had sex.

Finally, Table 5 presents odds ratios representing the results of multinomial regression analysis examining associations between covariates and class membership (Aim 3). For both sets of models, we used the largest class as the reference group (Multidimensional Positive for male students and Intimacy and Satisfaction with Pain for female students). Note that results of these tests should be interpreted with caution due to the relatively small sample sizes; however, we present them to provide a clearer view of the type of individuals and context of sexual behavior within each class.

For male students, importance of religion (but not service attendance) was associated with class membership; an increase of one point in importance of religion was associated with 14% greater odds of membership in the Guilt and Regret class compared to the Multidimensional Positive class. Male students who were older at first vaginal intercourse were had greater odds of being in the Intimacy and Satisfaction class compared to the Multidimensional Positive class. Male students who experienced first vaginal intercourse with a non-relationship partner had 71% lesser odds of being in the Intimacy and Satisfaction class compared to the Multidimensional Positive class. Both non-use of contraception and non-use of condoms were associated with greater odds of membership in the Guilt and Regret class compared to the Multidimensional Positive class. For example, non-use of contraception was associated with over 12 times greater odds of being in the Guilt and Regret class. However, although paired tests were significant for both correlates, the overall  $\chi^2$  was only significant for non-use of contraception.

For female students, religiosity correlates showed somewhat conflicting results. In paired comparisons, frequent religious service attendance was associated with three times greater odds of being in the Multidimensional Negative compared to the Intimacy and Satisfaction with Pain class; however, the overall  $\chi^2$  was not statistically significant. In contrast, the overall  $\chi^2$  was statistically significant for importance of religion, but paired comparisons did not statistically differ, although the direction suggested greater importance of religion for the other classes compared to the Intimacy and Satisfaction with Pain class. Age at

first vaginal intercourse was not associated with class membership for female students. First vaginal intercourse with a non-relationship partner was associated with membership in both the Multidimensional Negative and Mixed Feelings classes compared to the Intimacy and Satisfaction with Pain class; for example, engaging in first vaginal intercourse with a non-relationship partner was associated with nearly 18 times greater odds of being in the Multidimensional Negative class. Non-use of condoms and non-use of contraception were not associated with class membership for female students.

## DISCUSSION

This study examined consequences of first vaginal intercourse and how they differ by gender, using both variable-centered and person-centered approaches.

### Aim 1: Variable-centered analysis

Our variable-centered findings (Aim 1) were largely consistent with our expectations and prior studies examining first vaginal intercourse (e.g., Reissing et al., 2012; Schwartz & Coffield, 2020; Vasilenko et al., 2016), which found that both positive and negative consequences are common, and female adolescents and young adults tend to report more negative and fewer positive consequences than their male counterparts. In all cases where there were significant differences, male students were more likely to report positive consequences than female students. One particularly noteworthy example is that more than one-third of male students believed that engaging in first vaginal intercourse had enhanced their reputation, whereas very few female students did. In addition, female students were more likely to report all the negative intrapersonal consequences for which there was a gender difference, including those related to worry, regret, and pain. Male students were more likely to report two negative interpersonal consequences: worrying their partner wants more commitment and worrying another partner might find out, consistent with a sexual double standard that suggests that sexual behavior, including casual sex and sex outside of relationships, is more acceptable for men compared to women (Bordini & Sperb, 2013; Crawford & Popp, 2003). Thus, women are more likely to experience most negative consequences, as they may feel they went against societal standards. These findings suggest that despite some weakening of sexual double-standards, men and women may still be interpreting their first sexual intercourse in ways consistent with these differences in acceptability by gender.

Although we cannot directly compare this study of college students to prior studies of adolescents, the general prevalence patterns of positive and negative consequences by gender were similar between our research and adolescent-focused research. This similarity across age periods differs from research on how first intercourse is associated with mental health, which show more negative outcomes for individuals who initiate at earlier ages, and some potentially positive mental health outcomes for individuals who initiate in college (Meier, 2007; Spriggs & Halpern, 2008; Vasilenko et al., 2021). Thus, future research should examine how these consequences are associated with later mental health outcomes to better understand longer-term implications of these findings.

## Aim 2: Person-centered analysis

The person-centered analysis (Aim 2), which uncovered patterns of consequences for male and female college students, both supports and extends the variable-centered findings, and is also consistent with our expectations based on the sexual double standard (Bordini & Sperb, 2013; Crawford & Popp, 2003). First, male and female college students did not only differ in their level of consequences experienced, but also the latent classes revealed qualitatively different patterns of experiences that may be difficult to assess without a person-centered or qualitative approach. Analyses for male students revealed two classes marked by high probabilities of both intrapersonal and interpersonal positive consequences. The most common class for men, with about half of male students, was marked by a broad range of positive consequences, including common ones like intimacy and satisfaction, but also less common ones like feeling more attractive and that they enhanced their reputation. Another third of male students were in a class marked by high probabilities of a smaller number of positive consequences (physical satisfaction and intimacy), but low probabilities of any negative consequences. Only about 16% of male students were in a class marked by high probabilities of negative consequences, namely wishing they had not had sex and feeling things had moved too fast. In contrast, experiencing either mixed or negative experiences was normative for female students, with no class for female students marked by only positive consequences. Nearly one-third of female students were in a class marked by multiple intrapersonal and interpersonal negative, and no positive consequences, and another 20% experienced a mix of positive and negative consequences. The largest class for female students was marked by multiple positive consequences, but also a high probability of pain. Thus, the majority of male students were in classes marked by only positive consequences, whereas the majority of female students experienced a mix of positive and negative consequences. This difference likely reflects sexual double standards suggesting more acceptability of sexual behavior for men compared to women.

The probability of experiencing discomfort or pain was high across all classes for female students, suggesting some degree of discomfort is a common experience for women's first vaginal intercourse, even when initiated later in adolescence or young adulthood. This finding is consistent with prior variable-centered work suggesting that pain is common for women at first intercourse (Elmerstig et al., 2009; Walsh et al., 2011; Vasilenko et al., 2016). Although many adolescents believe the rupture of the hymen leads to pain during first vaginal intercourse, (Christianson & Eriksson, 2011), pain and discomfort may come from a number of sources with both physical and psychological origins (Meana & Lykins, 2009). Our findings, which show a high probability of women's pain in all classes, suggest a likely physical component to pain and discomfort during first vaginal intercourse. However, it is noteworthy that the largest class for female students includes a high probability of both physical satisfaction and pain, suggesting that experiencing some discomfort does not always preclude women from pleasure. Future research should aim to better understand these experiences of pain and discomfort and how they fit into adolescent girls' and young women's experiences of first vaginal intercourse.

### Aim 3: Covariates of class membership

Although the person-centered findings suggest that normative patterns include experiencing largely positive consequences for men and mixed consequences for women, the latent classes also suggest within-gender heterogeneity. For example, although the majority of male students belonged to classes marked by high probabilities of only positive classes, about 16% belonged to a class marked only by negative consequences. This class, called guilt and regret, differed from the Multidimensional Positive class in their beliefs about the importance of religion and their lower likelihood of having used any form of contraception, which is consistent with our hypothesis that religiosity and non-use of contraception would be associated with more negative consequences (Aim 3). Because most religious traditions proscribe sex outside of marriage, more religious sexually active men may feel they went against their beliefs and thus feel more guilt and regret. In addition, vaginal intercourse without contraception could lead to concerns about pregnancy and STIs. Further, because these men may have moral concerns about sexual behavior outside of marriage, they may have engaged in unplanned first intercourse, resulting in both lower rates of contraception use and a feeling that things moved too fast. In addition, two distinct profiles were marked by only positive consequences, including high probabilities of feeling physically satisfied close to a partner, but the Multidimensional Positive class was also likely to report a range of other positive consequences. Two factors distinguished membership in these two classes; individuals in the Intimacy and Satisfaction class first had vaginal intercourse later in college, and it was more likely to be with a relationship partner than individuals in the Multidimensional Positive class. This finding suggests groups of men with differing motivations for sex, with male students in the Intimacy and Satisfaction class more relationship oriented and waiting to have sex until in a committed relationship, whereas those in the Multidimensional Positive class be more oriented to have sex to cope or to enhance their reputation. These differing motivations could be differentially associated with risk behaviors; for example, engaging in sex to cope is associated with more risky sexual behaviors and a larger number of sexual partners, whereas sex for intimacy reasons is associated with less risky behavior and fewer partners (Cooper et al., 1998).

There were also three distinct patterns of consequences and associated covariates for young women, which generally support our hypotheses in Aim 3. The covariate most strongly associated with being in a class marked by negative consequences other than pain was first intercourse with a non-relationship partner, which was associated with membership in both the Multidimensional Negative and the Mixed Feelings classes compared to the Intimacy and Satisfaction with Pain class. This finding suggests the influence of the sexual double standard (Bordini & Sperb, 2013; Crawford & Popp, 2003), as first intercourse outside a relationship was predictive of patterns marked by negative consequences for female, but not male, students. In addition, it can be interpreted in light of recent research which suggests “hookups,” friends with benefits, and other non-relationship sexual experiences are increasingly common in college students (Garcia et al., 2012). In general, women report poorer emotional health after casual sexual relationships than men, although both men and women generally report more positive than negative consequences (Wesche et al., 2021). It is possible that engaging in first intercourse, in contrast to later sexual experiences, may be experienced particularly negatively for women if it happens outside

of a relationship, due to common perceptions of virginity as a special gift to bestow upon a partner (Carpenter, 2002). In addition, membership in the class with the most negative consequences, Multidimensional Negative, was associated with a higher likelihood of frequent religious service attendance compared to the Intimacy and Satisfaction with Pain class. Much as for male students in the Guilt and Regret class, this finding suggests that both young men and women may feel negatively about sexual experiences that go against their values and beliefs.

These findings have implications for the sexual health and well-being of adolescents and emerging adults. Individuals' perceptions of their first vaginal intercourse may influence their later sexual health and well-being, sexual self-concept, and overall mental health and wellbeing (Vasilenko et al., 2014). For example, experiencing negative consequences at first intercourse may negatively influence sexual self-concept, leading to expectations that future sexual encounters may be similarly negative. Female adolescents with worse sexual self-concept tend to experience less sexual satisfaction, which has implications for their romantic and sexual relationships in the future (Impett & Tolman, 2006). Similarly, more negative perceptions of first intercourse may also be associated with poorer mental health. One study found that experiencing more negative consequences of sexual behavior was associated with more negative affect on that day (Vasilenko & Lefkowitz, 2018). These sorts of negative outcomes may be more common for women, who experienced more negative consequences than men.

This study also has implications for sexual education and health promotion programs. First, as prevention programs are more effective when they contain information relevant to the population (Rotheram-Borus et al., 2009), this study provides information about the consequences of sex college students are actually experiencing. This study demonstrates that individuals very often do experience positive consequences at first vaginal intercourse. Sexual education programs that focus on abstinence, or that highlight only the potential negative consequences of vaginal intercourse, may not resonate with students because they do not represent their experiences. In contrast, programs that acknowledge positive consequences and encourage safer sex might be more effective, particularly with a college population. Second, gender differences in frequency and patterns of consequences suggest that information specifically tailored to men and women may be more effective in addressing individual needs. For example, programs aimed at young women could include content on evaluating and dismantling sexual double standards, which could help lessen negative feelings like guilt and regret. Furthermore, because pain was a common experience at first vaginal intercourse, programs could emphasize ways to mitigate pain, such as foreplay and using lubricants. For young men, first vaginal intercourse is frequently associated with only positive consequences. Whereas experiencing multiple positive consequences indicates a good experience, it also suggests some ways that men might engage in risky sexual behavior. In particular, male students in the Multidimensional Positive class experienced many positive consequences, and felt that sex raised their status in the eyes of their peers, which might lead to engaging in riskier sexual behavior, such as sex with multiple partners, in the future. Thus, programs that target sexual risk as a way of expressing masculinity may be useful for male adolescents.



There are several limitations that provide future directions for research. First, this study examined only college students who transitioned to first vaginal intercourse during four years at a residential university. Thus, it is unknown whether results would be similar for adolescents, or for similarly aged individuals who do not attend college, attend a different type of college, or live at home during college. Second, our sample size was relatively small, especially when stratified by gender. Although simulation studies suggest high power to detect at least a three-class model with our sample size and number of items (Dziak, Lanza, & Tan, 2014), the small sample size made it more difficult to fully investigate models with more classes or find small effects of correlates on latent class membership. Third, our focus on first vaginal intercourse limited our analysis to only one type of sexual behavior with a different-sex-partner. Limited research has examined the consequences of first intercourse in LGBTQ+ adolescents, who experience unique developmental tasks related to sexual identity that could lead to differential experiences (Vasilenko et al, 2020). Thus, future research should examine first experiences of a wider range of behaviors with same- and different-sex partners. Although we asked students about their first sexual experience closer to when it occurred than most studies of the topic, it is still possible that recall bias, as well as changes in relationship with their first sexual partner, may have influenced the results. Finally, we considered several covariates of class membership, but many other individual and situational factors might relate to class membership. This includes important variables like occurrence of orgasm and characteristics of the sexual partner such as their age, which were not included in this study. In addition, although the primary measure was developed based on a motivational perspective, we did not directly assess if individuals in these classes had different motivations for sex, or whether experienced consequences led to changes in individuals' motivations.

In addition to addressing these limitations, our research suggests other areas for future research. First, it would be informative to look at consequences of subsequent sexual experiences to ascertain whether patterns for first vaginal intercourse are similar for later episodes of sexual behavior, and whether consequences of first vaginal intercourse predict later consequences. In addition, using dyadic data to examine couple-level consequences of sexual behavior could help to better understand the relational nature of sexual behavior and how partners' experience can impact each other. Finally, our findings suggest that experiencing positive or negative consequences of first vaginal intercourse may impact mental health and well-being, sexual self-concept, and sexual health, and future research should examine these potential links.

Despite these limitations, this study contributes to the literature in several ways. First, findings provide support a normative developmental perspective by demonstrating that both male and female college students experience positive consequences of first vaginal intercourse. However, by using person-centered methods, we demonstrated more complex patterns. For instance, male colleges students were likely to experience mostly positive consequences, whereas female students were more likely to belong to classes marked by pain, mixed positive and negative consequences, or primarily negative consequences. These findings suggest that sexuality education programs should be more open about the positive aspects of sexual behavior, as well as focus on ways to make the transition to sex more positive for women.

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**Table 1.** Percent of Students Reporting Intrapersonal Consequences of First Sexual Intercourse by Participant Gender

Positive Intrapersonal Consequences	Total Sample	Male	Female	$\chi^2$
Any positive intrapersonal consequence	83.7	87.4	79.3	2.2
<i>Feel physically satisfied</i>	71.6	79.6	62.1	7.1**
<i>Feel better or cheered up</i>	52.4	65.4	36.8	15.5****
<i>Feel a thrill or rush</i>	66.5	70.2	62.1	1.4
<i>Feel attractive or better about yourself</i>	50.0	56.3	42.5	3.6
Negative Intrapersonal Consequences				
Any negative intrapersonal consequence	69.8	54.9	87.4	23.5****
<i>Worry about pregnancy</i>	42.9	35.3	51.7	5.2*
<i>Worry you were exposed to another STD</i>	22.5	20.2	25.3	0.7
<i>Worry you were exposed to HIV/AIDS</i>	13.7	11.7	16.1	0.8
<i>Not enjoy it</i>	15.2	6.7	25.3	12.7****
<i>Worry your parents may find out</i>	29.8	19.2	42.5	12.3****
<i>Experience any discomfort or pain</i>	35.6	7.7	69.0	77.6****
<i>Feel you went against your morals or ethics</i>	28.8	23.1	35.6	3.64
<i>Wish you had not had sex</i>	18.9	11.5	27.6	8.0****

Note:  $\chi^2$  indicates whether there are significant gender differences in reporting each consequence.

\*  $p < .05$

\*\*  $p < .01$

\*\*\*  $p < .001$ .



**Table 2.** Percent of Students Reporting Interpersonal Consequences of First Sexual Intercourse by Participant Gender

Positive Interpersonal Consequences	Total Sample	Male	Female	$\chi^2$
Any positive interpersonal consequence	81.9	82.4	79.3	0.3
<i>Feel intimate or closer to partner</i>	70.5	70.9	70.1	<0.1
<i>Feel you avoided annoying or angering your partner</i>	22.1	20.4	24.1	0.4
<i>Feel you enhanced your reputation</i>	23.2	38.8	4.6	31.1 <sup>***</sup>
Negative Interpersonal Consequences				
Any negative interpersonal consequence	44.4	50.0	37.9	2.8
<i>Feel like things moved too fast</i>	28.3	26.0	31.0	0.6
<i>Worry your partner wants more commitment</i>	18.0	26.5	8.1	10.8 <sup>***</sup>
<i>Worry another partner could find out</i>	5.8	9.6	1.2	6.3 <sup>**</sup>
<i>Feel you harmed your reputation</i>	14.1	12.5	16.1	0.5

Note:  $\chi^2$  indicates whether there are significant sex differences in reporting given consequence.

\*  $p < .05$

\*\*  $p < .01$

\*\*\*  $p < .001$ .

**Table 3.**

Fit Statistics for LCA Models of Consequences of First Intercourse

# of Classes	Male		Female			
	AIC	BIC	Entropy	AIC	BIC	Entropy
1	1100.39	1150.63	1.00	1057.89	1104.74	1.00
2	990.74	1093.87	.85	922.61	<b>1018.78</b>	.89
3	927.45	<b>1083.47</b>	.88	904.84	1050.33	.87
4	894.93	1103.84	.92	<b>897.60</b>	1092.41	.90
5	<b>882.87</b>	1144.66	.92	901.63	1145.76	.90
6	888.91	1203.60	.91	906.15	1199.59	.96

Note. AIC = Akaike information criterion; BIC = Bayesian information criterion.

**Table 4.** Item Response Probabilities for Latent Classes of Consequences of First Intercourse, by Gender

	Male			Female		
	Multidimensional Positive (49.39%)	Intimacy and Satisfaction (34.39%)	Guilt and Regret (16.22%)	Multidimensional Negative (31.11%)	Intimacy and Satisfaction with Pain (48.04%)	Mixed Feelings (20.86%)
<b>Positive Intrapersonal Consequences</b>						
<i>Feel physically satisfied</i>	<b>.96</b>	<b>.66</b>	.59	.20	<b>.75</b>	<b>.95</b>
<i>Feel better or cheered up</i>	<b>.95</b>	.42	.23	.00	.51	.59
<i>Feel a thrill or rush</i>	<b>.88</b>	.54	.49	.38	<b>.70</b>	.38
<i>Feel attractive or better about yourself</i>	<b>.90</b>	.27	.14	.13	.49	.13
<b>Negative Intrapersonal Consequences</b>						
<i>Worry about pregnancy</i>	.52	.10	.41	<b>.61</b>	.25	<b>.99</b>
<i>Worry about HIV</i>	.16	.00	.21	.30	.00	.32
<i>Worry about another STD</i>	.24	.03	.45	.38	.08	.47
<i>Not enjoy it</i>	.00	.03	.35	.57	.08	.17
<i>Worry your parents may find out</i>	.19	.02	.54	.39	.30	<b>.78</b>
<i>Experience any discomfort or pain</i>	.06	.00	.29	<b>.80</b>	<b>.61</b>	<b>.71</b>
<i>Feel you went against your morals or ethics</i>	.25	.00	<b>.66</b>	.55	.10	<b>.64</b>
<i>Wish you had not had sex</i>	.04	.00	.59	<b>.66</b>	.00	.33
<b>Positive Interpersonal Consequences</b>						
<i>Feel intimate or closer to partner</i>	<b>.85</b>	<b>.61</b>	.47	.28	<b>.97</b>	<b>.71</b>
<i>Feel you avoided annoying or angering your partner</i>	.32	.09	.08	.33	.17	.29
<i>Feel you enhanced your reputation</i>	<b>.67</b>	.10	.12	.07	.00	.11
<b>Negative Interpersonal Consequences</b>						
<i>Feel things moved too fast</i>	.31	.00	<b>.65</b>	<b>.64</b>	.05	.41
<i>Worried partner wants more commitment</i>	.40	.04	.33	.12	.00	.21
<i>Worried another partner will find out</i>	.14	.02	.12	.04	.00	.00
<i>Feel you harmed your reputation</i>	.13	.00	.35	.33	.00	.28

Note. Item response probabilities greater than .60 in bold to facilitate interpretation.

**Table 5.** Results of Multinomial Regression Predicting of Latent Classes of Consequences of First Intercourse, by Gender

	Male			Female			Overall $\chi^2$
	Multidimensional Positive	Intimacy and Satisfaction	Guilt and Regret	Overall $\chi^2$	Odds Ratios	Mixed Feelings	
Religious Service Attendance	REF	0.48	1.55	3.66	REF	0.88	5.55
Importance of Religion	REF	0.99	1.14*	9.99**	REF	1.04	6.29*
Age at First Intercourse	REF	1.71*	1.25	6.32*	REF	1.11	0.22
Non-Relationship Sex	REF	0.29*	1.73	9.10*	REF	6.90*	21.8***
Non-Use of Condom	REF	0.72	3.46*	5.42	REF	3.89	0.28
Non-Use of Contraception	REF	2.34	12.37*	7.6*	REF	5.42	3.33

\*  $p < .05$

\*\*  $p < .01$

\*\*\*  $p < .001$