SEXUAL MINORITY ADOLESCENTS: UNDERSTANDING DISPARITIES IN SEX EDUCATION AND PARENT COMMUNICATION ABOUT SEX

a dissertation

by

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Abstract

Background: Sexual minority youth experience many sexual health inequities compared to heterosexual youth. Research conducted over the past several decades has concluded that both parent-adolescent sex communication and school-based sex education are effective in reducing levels of sexual risk behavior in heterosexual youth. A much smaller number of studies have examined the experiences and effectiveness of sex education or PASC among sexual minority youth.

Purpose: This three-manuscript dissertation seeks to extend understanding about the experiences of sexual minority and heterosexual youth with learning about sex and sexuality at school and at home and how these learning experiences affect sexual risk behavior. The purpose of this dissertation is to examine parent-adolescent sex communication from the perspective of sexual minority youth and their parents, assess the impact of different types of sex education on sexual intercourse and contraceptive behavior of sexual minority and heterosexual adolescent females, and revise and extend a scale designed to measure sexual minority youth perceptions of sexual-minority-inclusivity in sex education.

Methods: In the first manuscript, we conducted an integrated review that described how parents and SGM youth perceive their sex communication experiences and synthesized findings about the associations between parent-adolescent sex communication and sexual health outcomes among SGM youth. In the second manuscript, we used National Survey of Family Growth data to describe the total sex education content received by an individual, examine the impact of different sex education types on sexual intercourse and contraceptive behavior of adolescent females, and examine differences by sexual identity. In phase one of the last study, we revised a scale to measure SMYA perceptions of sexual minority-inclusivity in school-based sex education

received before the age of 18 years. Phase two involved implementing a pilot study to measure the reliability and conduct a Rasch analysis of the revised scale.

Results: The integrated review results suggest that parent-adolescent sex communication was complicated by barriers to communication and was limited, heteronormative, and influenced by SGM disclosure. Parent-adolescent sex communication may improve sexual health outcomes, but adequate parental education/guidance is lacking. Secondary data analysis results suggest that compared to their heterosexual peers, sexual minorities were more likely to report no sex education and less likely to report receipt of abstinence-only education. Nearly all types of education had a statistically significant effect on sexual behavioral outcomes (intercourse in the past 12 months and type of contraceptive use) as compared to no sex education. Scale revision and psychometric analyses suggested that the new scale has strong psychometric properties, including reliability, content validity, and measurement precision.

Conclusion: Overall, this dissertation has highlighted the ways that home and school-based sources of sexual health information do not currently meet the needs of SM youth. The sexual health education of SM youth is complicated by a lack of comfort, knowledge, and resources experienced by both teachers and parents. Qualitative studies suggest that both sources of sexual health information tend to be focused on heterosexual needs, leaving SMY feeling frustrated and invisible. This dissertation has also highlighted the need for quantitative measures to extend understanding of the impact of parent-adolescent sex communication and sex education on sexual minority youth. The revised scale presented in Chapter 4 provides a promising measurement tool to inform the development and evaluation of sexual minority-inclusive sex education programs. The results of this dissertation will ultimately contribute to the

development of programs and interventions to support SM-inclusivity in school-based, family-based, and healthcare provider-based sexual health education.

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Chapter One:

Introduction to the Dissertation

Introduction

This three-manuscript dissertation seeks to extend understanding about the experiences of sexual minority and heterosexual youth with learning about sex and sexuality at school and at home and how these learning experiences affect sexual risk behavior. These results may be used to support parents and teachers in delivering sexual health information in a manner that is responsive to the needs and desires of sexual minority youth (SMY). Additionally, the findings may develop a foundation from which to improve healthcare provider communication with SMY and advance SMY health outcomes.

Chapter One describes the dissertation's overall rationale and program of research. Chapter One is composed of the following sections: significance of the proposed program of research; a brief literature review; an overview of the overarching theoretical framework; the overall purpose of the proposed program of research and aims associated with each manuscript; and the implications of the proposed research for nursing science.

Significance of proposed research

Youth learn about sex and sexuality from multiple sources, including schools, parents, healthcare providers, peers, and the internet (Bible et al., 2020; Kubicek et al., 2010). School-based sex education and communication between parents and adolescents about sex (parent-adolescent sex communication, or PASC) are arguably two of the most important sources of information about sex and sexuality for adolescents. Research conducted over the past several decades has concluded that both PASC and school-based sex education (hereafter called sex education) are effective in reducing levels of sexual risk behavior in heterosexual youth (Centers for Disease Control & Prevention (CDC), 2020b; Chin et al., 2012; Coakley, Randolph, Shears, Beamon, Collins, & Sides, 2017; Widman et al., 2016). A much smaller number of studies have

examined the experiences and effectiveness of sex education or PASC among sexual minority youth (SMY; Bouris et al., 2010; Flores & Barroso, 2017; Phillips et al., 2020). The term 'sexual minority' refers to youth who self-identify as lesbian, gay, bisexual, queer, or other nonheterosexual orientation or "who are attracted to or have sexual contact with people of the same gender" (CDC, 2019a, n.p.).

As Americans have become more accepting of sexual minorities over time, the proportion of people identifying as a sexual minority has increased, with younger generations identifying as a sexual minority at far higher rates than older generations (Brown, 2017; Jones, 2021). A 2020 Gallup poll found that 15.9% of young adults aged 18-23 identified as lesbian, gay, bisexual, or transgender (LGBT), while less than 2.0% of Americans aged 56 and older identified as LGBT (Jones, 2021). Similarly, Youth Risk Behavioral Surveillance data from 2019 suggests that nationwide, 15.6% of high school students identify as a sexual minority, with 2.5% identifying as gay or lesbian, 8.7% bisexual, and 4.5% not sure (Underwood et al., 2020). Female youth were much more likely than male youth to identify as a sexual minority (22.4% vs. 8.8%; Underwood et al., 2020).

Sexual minority youth experience many sexual health inequities compared to heterosexual youth. For example, they are more than twice as likely to have sex before age 13 (7.3% vs. 3.4%; Kann et al., 2016) and to experience dating violence (23.2% v. 12.3%; Dank et al., 2014). Female sexual minority youths are more likely to ever have been pregnant than their heterosexual peers (CDC, 2019b). Sexual minority males are also at greatly increased risk of HIV infection; 92% of new HIV infections in young men were attributed to male-to-male sexual contact (CDC, 2020a). Given these disparities, examining how parental guidance and school-

based education about sex may influence this vulnerable population is imperative (Flores & Barroso, 2017; Phillips et al., 2020).

Sexual minority youth may experience the process of learning about sex and sexuality from parents and school teachers differently than heterosexual youth (Guilamo-Ramos et al., 2016; Rasberry et al., 2018). Information may be conveyed under the assumption that the youth is heterosexual (Bouris et al, 2010; Gowen & Winges-Yanez, 2014; Rasberry et al., 2018), although sexual minority youth may have different sexual health learning needs than heterosexual youth. For example, compared to heterosexual youth, sexual minority youth reported more interest in learning about sexual identity and were more likely to report that such learning was important because it would protect their health (Wilson et al., 2018). Additionally, in some families and classrooms, communication may be negatively affected by disapproval or even outright rejection of sexual minority identities.

Improving the health of sexual minority adolescents and increasing the proportion of all adolescents receiving formal education about topics such as birth control methods and prevention of sexually transmitted infections (STIs) are Healthy People 2030 goals (Office of Disease Prevention and Health Promotion, n.d.). Additionally, the American Academy of Pediatrics highlights the need for schools, parents, health care providers, and other professionals to support the development of healthy sexuality and decision-making in youth by providing developmentally appropriate information about a variety of sexual health topics, including sexual orientation, gender identity, consent, and relationships (Breuner et al., 2016).

Accordingly, the purpose of this three-manuscript dissertation is to better understand home and school-based learning about sex and sexuality and how it affects the sexual health and behavior of sexual minority youth. This dissertation will examine PASC from the perspective of

sexual minority youth and their parents, assess the impact of different types of sex education on sexual intercourse and contraceptive behavior of sexual minority and heterosexual adolescent females, and revise and extend a scale designed to measure sexual minority youth perceptions of sexual-minority inclusivity in sex education. Results may be used to inform sex education policy and curriculum development as well as development of programs or initiatives to support PASC.

Brief review of literature

SMY, like all youth, obtain sexual health information from multiple sources. Schools and parents are often considered the more 'traditional' sources of information, while peers, the internet, other forms of media and health care providers are typically labeled as alternate sources of information (Kubicek et al., 2010; Burkill & Waterhouse, 2019; Nelson et al., 2019).

Traditional sources of sexual health information: School teachers and parents

Research on heterosexual youth has suggested that parent-adolescent sex communication (PASC) can reduce sexual risk behavior **(**Coakley, Randolph, Shears, Beamon, Collins, & Sides, 2017**;** Widman et al., 2016). Additionally, research suggests that many parents want to be a main source of sexual health information for their children, and youth also would like to learn from their parents (Charest et al., 2021; Flores et al., 2019; Rose et al., 2014). However, as discussed in more detail in Chapter Two, parents often feel uncomfortable and lack knowledge specific to sexual minority relationships.

Furthermore, parents may not be aware that their child identifies as a sexual minority and tend to focus on topics typically more of concern to heterosexual youth, such as pregnancy (Charest et al., 2021; Kubicek et al., 2010). In a Flores et al. (2019) study, male SMY reported a lack of discussion of sexual orientation or same-sex attraction with their parents before disclosure; when sexual orientation was discussed, it was often a negative remark about sexual

minorities. However, a small number of participants recalled initiating conversations with their parents about sexual orientation because their parents had already communicated "a general acceptance of non-heterosexual individuals" (Flores et al., 2019, p.541). Nelson et al. (2019) found that speaking with parents about two topics, how to communicate with a sexual partner about they want sexually and how to communicate with a sexual partner about what they do not want to do sexually, was associated with less condomless anal sex; other PASC topics (such as sexually transmitted infections or how to say 'no' to sex) were not associated with sexual behavior. Only about 25% of SM male youth reported talking with a parent about how to communicate with a sexual partner, however (Nelson et al., 2019). Multiple studies have found that messages about HIV risk and using condoms were the most common topics of PASC (Flores et al., 2019; Goldfarb et al., 2018; LaSala, 2015; Newcomb et al., 2018). In summary, although PASC among SMY may be beneficial, SMY report that it is typically infrequent, limited in scope, and focused on heterosexual sexual behavior.

School-based sex education often fails to meet the needs of SMY as well. Multiple qualitative studies have suggested that sex education is focused on heterosexual sex, primarily conveying messages related to abstaining from penile-vaginal sex and preventing pregnancy and STIs (Bible et al., 2020; Gowen & Winges-Yanez, 2014; Jarpe-Ratner, 2020; Pingel et al., 2013). Sexual minority youth report feeling ignored and invisible during sex education classes (Formby, 2011; Hobaica & Kwon, 2017), indicating that their sex education did not discuss sexual orientation at all: "[Teachers] don't really say that there are actually [LGBTQ] people or anything" (Gowen & Winges-Yanez, 2014, p. 791). In other cases, sexual identity was discussed, but mainly in the context of "being at risk for HIV … or other STIs" (Gowen & Winges-Yanez, 2014, p. 792). Youth also reported a lack of information about oral and anal sex. As one

participant stated, “A lot of people don’t realize that you can transmit STIs through oral sex” (Hobaica & Kwon, 2017, p.433). According to Kubicek et al. (2008), lack of instruction about anal sex leaves young male sexual minorities “ill equipped to understand the mechanics of sex; uninformed about risk for HIV and STIs; and unable to advocate for what they might find pleasurable, let alone for safer sex during their sexual debut (p. 235).” The lack of information that was important to sexual minorities led them to question the relevance of the curriculum: “I don’t have to worry about being pregnancy or getting anybody pregnant, and so I didn’t feel that a lot of it had to do with me” (Gowen & Winges-Yanez, 2014, p.792). For reasons such as these, sexual minority youth are less likely than heterosexual peers to report schools as a main source of sexual health information (Charest et al., 2016; Wilson et al., 2018).

Similarly, a study of teacher perceptions of sex education in Montana suggests that teachers felt that educating students about sexual orientation and gender identity was less important than teaching about other topics, such as sexual consent and HIV/STD prevention. Teachers in this study also reported “less thoroughly covering” and feeling less comfortable teaching about sexual orientation and gender identity, citing lack of training and knowledge in LGBTQ issues as major barriers (Sondag et al., 2020, p. 13).

Alternate sources of sexual health information

The lack of support and information from schools and parents may lead sexual minority youth to turn to other sources of information, such as health care providers, educational websites on the internet, pornography, peers, and sexual partners or early sexual experiences (Bible et al., 2020; Hobaica & Kwon, 2017; Kubicek et al., 2010; Mitchell et al., 2014; Nelson et al., 2019; Pingel et al., 2013; Steinke et al., 2017). Although these alternate sources may help sexual minority youth acquire helpful information, their levels of accuracy, comprehensiveness, and

beneficence are likely to vary greatly (Bible et al., 2020). In particular, these sources may impart erroneous or incomplete information (with the general exception of health care providers) or have other negative consequences (such as an increased risk of an unwanted early sexual encounter or of exposure to sexual violence in pornography).

Health care providers. Similar to parents, health care providers may lack knowledge of sexual minority health issues and assume patients are heterosexual (Laiti et al., 2019). Although health care providers have been cited by SMY as preferred or common sources of sexual health information (Wilson et al., 2018), they may often fail to ask about sexual identity and be "unaware of their patients' sexual orientation" (Laiti et al., 2019; Rose & Friedman, 2012). Youth have cited fear of judgment or confidentiality concerns (worries that health care providers would share information about their sexual identity with their parents) as reasons for avoiding sexual health communication with providers (Rose & Friedman, 2012; Kubicek et al., 2010). However, SMYA also reported becoming more comfortable and having positive experiences discussing sexual health information with providers once they were older and being treated by health care providers who did not known them as children (Kubicek et al., 2010).

Internet. Researchers have identified the internet as a key source of information for sexual minority youth (Charest et al., 2021). SMY have high rates of searching online for information as compared with their heterosexual peers: SGMYs were five times more likely to have conducted internet searches about sexuality or sexual attraction (62% v. 12%) and four times more likely to have looked online for information about HIV/AIDS and other STIs (19% v. 5%; GLSEN, 2013).

Sexual minority youth have reported preferring to search online for information because it was confidential, relevant and explicit (Hobaica & Kwon, 2017; Rose & Friedman, 2012).

Sexual minority young adults have reported using search engines such as Google or Yahoo and websites such as WebMD, the Mayo Clinic, or CNN (Pingel et al., 2013) to gather information about different sexual orientations, sexual positions, and ways to protect their sexual health (Hobaica & Kwon, 2017). They have expressed the desire for explicit, detailed information, such as a 'how-to' guide for anal sex (Pingel et al., 2013, Nelson et al., 2019) and the preference for inclusion of mental health information along with sexual health information (Pingel et al, 2013; Steinke et al., 2017).

While SMY can use the internet to gain a sense of community and obtain information difficult to obtain elsewhere (Kubicek et al., 2010), youth may have difficulty identifying reliable information and may obtain false or erroneous information. Additionally, Steinke et al. (2017) reports that online experiences sometimes left SM youth them feeling further alienated.

Peers and informal mentors. Sexual minority peers or informal mentors may act as important sources of support and helpful and relevant information (Bible et al., 2020; Hobaica & Kwon, 2017). Youth stated that they felt more comfortable talking with those who shared similar experiences and identities, but that finding queer friends could be difficult, particularly prior to disclosure of their own identity (Hobaica & Kwon, 2017). Informal mentors, often adult family members or other adults from the sexual minority community, provided support and information as well (Bible et al., 2020) but may lack preparation or knowledge for discussions beyond first sexual experiences and condom use (Kaufman et al., 2020).

Pornography. Some youth described learning about how sexual intercourse 'works' and exploring their same-sex sexual attraction by watching pornography (Hobaica & Kwon, 2017; Kubicek et al., 2010). "Because there's really no information on [anal sex] … there's really no strong definition nor strong advice about anal sex. It's usually just through word of mouth or

from porn" (Kubicek et al., 2010, p. 251-2). Some respondents reported that as children they were not sure what the term 'gay' meant and they sometimes used search words such as 'naked men' which often led them to pornography (Kubicek et al., 2010). While some respondents focused on the validation of their sexual attraction that the pornography provided, some respondents felt that pornography was "unhealthy" or were critical of the content of the pornography they viewed (Kubicek et al., 2010). Downing et al. (2014) found that about one-third of all gay male sexually explicit material included condomless anal sex, which may encourage sexual risk behaviors (Stein et al., 2011).

Learning through sexual experiences. Compared to heterosexual youth, sexual minority youth are more likely to report that sexual partners are a primary source of information (Burkill & Waterhouse, 2019). SM youth have described "learning through trial-and-error" (Hobaica & Kwon, 2017, p. 435), experimenting sexually and learning from the consequences (Hobaica & Kwon, 2017; Kubicek et al., 2010). As one youth reported, "Our sex education focused on what happens when a penis is involved with a vagina, and I was with a woman and there was no penis in the room. We had no clue what we were doing. There was no road map and absolutely no knowledge about any risks involved" (Hobaica & Kwon, 2017, p. 435). A few male youth reported intensely painful first sexual experiences, which they linked to a lack of preparation and knowledge about sex (Kubicek et al., 2010; Pingel et al., 2010). A substantial amount of this early experiential learning occurred with older sexual partners, who were typically 2-3 years older (Kubicek et al., 2010). In smaller number of cases, SM youth reported sexually engaging at ages 12-13 years with men who were in their 20s and 30s, which may increase the risk of unhealthy mental and physical health outcomes (Kubicek et al., 2010).

Importance of PASC and Sex Education

While alternate sources of information may contribute positively to SMY learning about sex and sexuality, they cannot and should not replace PASC and sex education. Parents and teachers can play a pivotal role in providing sexual health information to all youth that is medically accurate, developmentally appropriate, and supportive of sexual minorities (Advocates for Youth et al., 2015; Breuner & Mattson, 2016). Schools can directly address stigma and discrimination faced by sexual minorities (Sanchez, 2012); normalizing discussion of diverse sexual identities could work to reduce stigmatization of sexual minorities and aid families and friends in providing sensitive support to minorities (Hobaica & Kwon, 2017; Raifman et al., 2018). A sex education program that is inclusive of sexual minorities may function as an important part of a safe and accepting school climate for sexual minority youth in schools (Snapp et al., 2015).

Parents who discuss sex and sexuality with their children are able to share their own personal experiences and values and tailor their conversations to their child's specific personalities and needs. By discussing sex and sexuality in an accepting and inclusive manner, parents may contribute to the overall health and well-being of their sexual minority child (Ryan et al., 2010) and foster the development of accepting attitudes toward sexual minorities in all children.

Theoretical framework for proposed program of research

This program of research is guided by two theories: Minority Stress theory (Meyer, 2003) and the Information, Motivation, and Behavior (IMB) theory (Fisher et al., 2002).

Minority Stress Theory

Minority Stress Theory proposes that occurrences of prejudice and discrimination contribute to higher levels of mental health problems in stigmatized populations (Meyer, 2003). The theory's major area of focus is Minority Stress Processes, both distal and proximal. Distal Minority Stress Processes include experiences of prejudice and discrimination such as verbal, sexual, and physical harassment (Meyer, 2003). Proximal Minority Stress Processes are defined as internal or personal reactions to such experiences, including expectations of rejection and internalized homophobia. According to Meyer's theory, Minority Stress Processes, along with Characteristics of Minority Identity (including having multiple minority identities, the importance the person assigns to their minority status, and how the person accepts or evaluates their minority status) and Coping and Social Support, influence Mental Health Outcomes, which may be positive or negative. Meyer does not give a clear definition of mental health outcomes, but the reader can infer that mood disorders, including depression, anxiety disorders, and substance use disorders fall under the general category of mental health outcomes.

This dissertation posits that experiences of heteronormativity during PASC and sex education are examples of distal minority stress processes. Accordingly, these experiences with heteronormativity while learning about sex and sexuality may negatively affect the mental health of sexual minority youth. This dissertation proposal extends Minority Stress Theory beyond mental health by positing that mental health influences sexual behavior, a proposition that is supported by empirical research (Agnew-Brune et al., 2019; Rosario et al., 2006).

Information, Motivation, and Behavioral Skills Theory

The Information-Motivation-Behavioral Skills (IMB) model is a well-established theory initially proposed by Fisher and Fisher in 1992 to develop a conceptual and methodological

foundation for AIDS prevention programs (Fisher et al., 2014). The IMB model posits that there are three key factors that influence whether an individual engages in HIV preventative behaviors such as condom use during sex and HIV testing. These three factors are the information an individual receives about HIV prevention, motivation to avoid acquiring HIV, and behavioral skills and the self-confidence or belief that one has the knowledge and skills to engage in HIV preventative behaviors (Fisher et al., 2002). In many cases, the impact of information and motivation on behavior is mediated by behavioral skills. The authors note, however, that in cases when the preventive behavior is "relatively simple or may be undertaken unilaterally" (Fisher et al., 2014; p.118) (as in the case of HIV testing, for example), there may be a direct relationship between information and HIV-preventive behavior as well as motivation and HIV-preventive behavior. Previous studies have used this framework to investigate the efficacy of school-based HIV prevention programs (Fisher et al., 2002) or examine sources of sexual health information (Charest et al., 2016). While much work related to IMB theory is related to HIV prevention, it has been applied to other health behaviors, such as safer injection drug use behaviors, adherence to antiretroviral medication regimens, obesity prevention, and diabetes self-management (Fisher et al., 2014).

Notably, the IMB model proposes that the first step to designing HIV interventions is assessing the target population's existing level of information, motivation, behavioral skills, and behavior in order to identify strengths, weaknesses, and areas of greatest need; researchers may determine which aspects of information, motivation, and behavioral skills need to be emphasized. Using the elicitation research generated in the first step, a population-specific intervention is then developed. Once implemented, the third step is to rigorously evaluate the efficacy of the intervention program.

This dissertation proposal is grounded in IMB theory in its focus on communication of sexual health information and the impact of communication or education about sex on sexual behavior. As described in more detail in chapter four, the third manuscript presents a more detailed theoretical framework that proposes relationships between inclusivity, mental health, and sexual behavior by combining and extending Minority Stress Theory and IMB theory.

Purpose and aims of proposed program of research

The purpose of this proposed program of research is to extend knowledge about the sexual health education of sexual minority youth. Sexual minority youth often experience an education at home and at school that does not meet their needs for relevant and affirming sexual health information. Current knowledge about the experiences of sexual minority youth with sex education and PASC, as well as the impact of these two sources of sexual health information on youth health, is limited. This dissertation will address this gap in a three manuscript format. The first proposed manuscript is an integrative review that describes the perceptions of both parents and sexual and gender minority (SGM) youth regarding their experiences communicating about sex and sexuality. It will also examine that impact of that communication on SGM youth sexual health outcomes. The second proposed manuscript assesses the impact of different types of sex education on sexual behavior outcomes (sexual intercourse and contraceptive behavior) of sexual minority and heterosexual adolescent females. Additionally, it examines whether sexual identity modifies the relationship between education type and sexual behavioral outcomes. The third proposed manuscript involves two phases. Phase one will involve the revision and extension of a scale designed to measure SMY perceptions of sexual-minority inclusivity in sex education. In phase two, the scale will be administered to a sample of sexual minority college students to assess reliability and conduct a Rasch analysis. The third proposed manuscript will be a crucial

step toward the rigorous measurement and evaluation of sexual minority-inclusivity in sex education.

Table 1. List of Manuscripts with Associated Aims

Manuscript	Aims
Chapter 2. Integrative review: Parent-Adolescent Sex Communication with Sexual and Gender Minority Youth	(1) To describe how heterosexual parents and SGM youth perceive their sex communication experiences (2) To synthesize findings about the associations between parent-adolescent sex communication and sexual health outcomes among SGM youth
Chapter 3. Secondary data analysis: Associations between Sex Education Types and Sexual Behaviors Among Female Adolescents: A Secondary Data Analysis of the National Survey of Family Growth 2011-2019	(1) To devise a parsimonious way to effectively use NSFG data to describe the total sex education content received by an individual (2) To provide an updated, detailed assessment of the prevalence and impact of different sex education types on sexual intercourse and contraceptive behavior of adolescent females (3) To examine differences by sexual identity— whether reports of exposure to sex education vary by sexual identity and whether sexual identity modifies the relationship between education type and sexual behavioral outcomes.
Chapter 4. Scale revision: Revising and Assessing the Reliability and Validity of a Scale to Measure the Perceived Inclusion of Sexual Minorities in Sex Education	(1) To refine a scale to measure SMYA perceptions of sexual minority-inclusivity in school-based sex education received before the age of 18 years. (2) To conduct a pilot study to measure the reliability and conduct a Rasch analysis of the revised scale.

Implications of the proposed research for nursing science

In order to address how this study advances nursing science, it is important to first define 'nursing' as a discipline and describe how the goals of the proposed study align with the goals of

nursing science. The American Nurses Association's (ANA) Code of Ethics states that nursing involves, in part, "the promotion, protection, and restoration of health and well-being" in the care of the individuals, families, and populations (ANA, 2015, p.23). The ANA also notes nursing's commitment to vulnerable populations and to work to change social conditions that harm health and well-being, while Provision 1 of the Code of Ethics emphasizes the "inherent dignity, worth, and unique attributes"(p.17) of every person.

The goals of the proposed study are closely aligned with the nursing priorities described above. First and most importantly, the study has the health and well-being of a vulnerable population as its focus. This study works to change social conditions by "[critically evaluating the] assumptions, contexts, and influences underlying human health experiences" (Grace et al., 2016, p. 67); participant responses in this study will help to depict the broader social context that influences individual understandings of what it means to identify as a sexual minority. Similarly, Meleis (2018) notes that nursing is a humanistic science that attends to people's life experiences and the meanings of those experiences, as well as the historical, political and social structures that influence those experiences.

This proposed study makes an original contribution to the field of nursing by extending knowledge about the health education of sexual minority youth. The importance of providing health care and health education that is sensitive to the needs of diverse groups is well recognized in the nursing profession (Shen, 2015), yet until recently only a scant amount of nursing research had focused on sexual and gender minority issues (Jackman et al., 2019). Second, the proposed studies advance nursing science because they will promote a deeper understanding of the complexities of health-based communication; well-developed understandings of communication are integral to the practice of nursing and its mission to

prevent and treat illness and disease as well as promote health (Kourkouta & Papathanasiou, 2014). Finally, this proposed study is well-aligned with the position statements of several nursing organizations. Both the American Academy of Nursing (AAN, 2013) and the American Nurses Association (ANA, 2018) support the "advocacy and establishment of policies and initiatives that enhance the health of LGBTQ people" (p.1). More specifically, the National Association of School Nurses' (2017) position statement suggests that school nurse leaders, in conjunction with parents, health educators, administrators, and other stakeholders, advocate for sexual health education that includes the needs of all youth.

Summary

The three proposed manuscripts seek to synthesize the emerging body of research regarding parent-adolescent sex communication among SGM youth (Chapter Two), to examine relationships between types of school-based sex education and sexual behavior among all youth and test for differences by sexual identity (Chapter Three), and to revise and conduct a Rasch analysis of a scale that measures sexual minority young adult perceptions of sexual minority-inclusivity in school-based sex education. The results of this proposed program of research may be used to inform health education and nursing science.

References

Refer to Cumulative Reference List

Chapter 2:

Parent-Adolescent Sex Communication with Sexual and Gender Minority Youth: An Integrated Review

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This manuscript is intended to replace the literature review section of the traditional dissertation. The primary author of this manuscript is Elizabeth Anne McKay; contributions included study conceptualization, literature search, data analysis and interpretation, initial manuscript drafting, and manuscript revision and editing. Holly B. Fontenot is the second author; contributions included data analysis and interpretation, manuscript revision and editing, and final approval of manuscript. ***This manuscript was published in the Journal of Pediatric Health Care in 2020****. The official publication of the National Association of Pediatric Nurse Practitioners, this journal is peer-reviewed and has an impact factor of 1.490 (2019).*
The Journal of Pediatric Health Care publishes clinical information and research regarding children of all ages (from newborn to young adults) within a familial context. In addition, the Journal publishes articles regarding policy, advocacy, and education related to children and their families. This manuscript represents a significant contribution to the dissertation work.

Abstract

Introduction: Sexual and gender minority (SGM) youth experience adverse sexual health outcomes at higher rates than their heterosexual and cisgender peers. While parent-adolescent sex communication (PASC) is associated with improved sexual health outcomes among heterosexual youth, less is known about PASC with SGM youth.

Methods*:* Studies describing experiences of SGM youth and parents during PASC and/or health outcomes of PASC were reviewed.

Results: Eleven studies met inclusion criteria, and six themes emerged. These included: 1) limited communication and barriers to communication, 2) impact of SGM disclosure on communication, 3) HIV/STI focused communication, 4) heteronormative communication, 5) outcomes of communication, and 6) youth preferences for PASC.

Discussion: PASC was complicated by barriers to communication and was limited, heteronormative, and influenced by SGM disclosure. PASC may improve sexual health outcomes, but adequate parental education/guidance is lacking. This review identifies ways that health providers can foster positive/inclusive PASC.

Introduction

Communication between parents and adolescents about sex, or parent-adolescent sex communication (PASC), is associated with decreased levels of sexual risk behavior in heterosexual youth (Coakley et al., 2017**;** Widman, Choukas-Bradley, Noar, Nesi, & Garrett, 2016). While PASC has been investigated from a heterosexual framework for several decades, only a small number of recent studies have examined parent sex communication with sexual and gender minority (SGM) youth (Bouris et al., 2010; Flores & Barroso, 2017). Sexual minority may include, but is not limited to, identifying as gay, lesbian, bisexual, and queer. Gender minority may include, but is not limited to, identifying as transgender, gender non-binary, and genderqueer (a person's gender identity is not the same as their sex assigned at birth) (National LGBT Health Education Center, 2017). As cultural awareness and acceptance of the SGM community grows, youth are disclosing their sexual orientation and/or gender identity to others at earlier ages (Brown, 2017; Pew Research Center, 2013). Currently over 1.3 million high school students in the United States identify as sexual minority and over 500,000 report that they are unsure of their sexual identity (Zaza, Kann, & Barrios, 2016). An additional 1.8% of high school students identify as transgender (Johns et al., 2019). Collectively, SGM youth experience negative sexual health outcomes at higher rates than their heterosexual peers. For example, young gay males are at a disproportionately high risk of becoming infected with HIV (Centers for Disease Control & Prevention, 2014), lesbian and bisexual adolescent females are at a greater risk of sexually transmitted infections (STIs) and unplanned pregnancies (Doull et al., 2018; Hodson, Meads, & Bewley, 2017), and transgender youth are more than three times as likely to report engaging in sexual intercourse before age thirteen (Johns et al., 2019). Given these

inequities, examining how parental guidance about sex may influence this vulnerable population is important (Flores & Barroso, 2017).

PASC may function differently in families with SGM youth (Guilamo-Ramos, Lee, & Jaccard, 2016). Prior to youth disclosing their SGM identity, parents are likely to convey information about sex under the assumption that their child is heterosexual and cisgender (gender identity the same as sex assigned at birth) (Bouris et al, 2010). In some families, after disclosure, communication may be negatively affected by parental disbelief, disapproval or even outright rejection of the child. Recently, a limited number of studies have begun to elucidate experiences with and outcomes of PASC among heterosexual parents and sexual minority youth.

As it is a national priority to improve the health of LGBT individuals (U.S. Department of Health and Human Services, 2014), this review seeks to answer the following questions: (1) How do heterosexual parents and SGM youth perceive their sex communication experiences? (2) What are the associations between PASC and sexual health outcomes among SGM youth? We define sex communication as the exchange of information regarding different types of sexual activities (including oral, vaginal, anal sex) as well as related topics such as puberty, reproduction, making healthy decisions about sex, relationships, and STI prevention (Flores, Docherty, Relf, McKinney, & Barroso, 2018).

Methods

The literature search was conducted in consultation with a reference librarian. Databases included PubMed, CINAHL, Web of Science, PsycINFO, and Genderwatch. Examples of search terms included parent, child, adolescent, communication, sexual orientation, transgender, and LGB (lesbian, gay, bisexual) (see Box 1). Titles and abstracts of 386 articles were read to determine relevancy. The sample of relevant articles were selected according to the following

inclusion criteria: (1) peer-reviewed, (2) English language, (3) focused on SGM adolescents or young adults between the ages of 13-25 years, (4) described or examined communication with heterosexual mother, father, parents, or family, (5) communication was specific to sexual behavior or sexual health, and (6) research was conducted in the United States. Case studies or articles intended solely to inform clinical practice were excluded. Ten qualitative articles were reviewed in full text and two were excluded for lack of rigor or focus on the family communication style (such as levels of agreement or mutuality) rather than description of sex communication. Five quantitative articles were reviewed in full text and two were excluded for not meeting inclusion criteria.

Eight qualitative studies and three quantitative studies met the inclusion criteria and are included in this integrative review. A systematic analysis of the studies involved identifying the analytical approach, study purpose, demographic characteristics of study samples, and main findings (see Table 1). All articles demonstrated adequate rigor for the findings to be useful to guide practice or future research. Common themes across articles were identified and are presented in this comprehensive summary.

Findings

Characteristics of Studies Reviewed

Eleven studies were included in the final sample. The majority utilized a qualitative approach to describe youth or parent experiences with PASC via interviews or focus groups. All quantitative studies utilized cross-sectional surveys to examine the relationships between PASC and the sexual health-related behaviors; however, PASC and the outcome health behaviors were defined, measured, and analyzed differently. Only two studies focused exclusively on PASC

with sexual minority youth. The rest examined PASC as one variable among other constructs such as parental monitoring, parent-adolescent attachment or relationships, or maternal warmth.

Three studies were conducted in the Northeast, three in the South, one in the Midwest, and four were national samples. Across studies, youth participants ranged in age from 13-25 years old and primarily identified as gay or bisexual and cisgender male (Bouris, Hill, Fisher, Erickson, & Schneider, 2015; Feinstein et al., 2018; Flores et al., 2018; LaSala, 2007; LaSala, 2015; Rose, Friedman, Annang, Spencer, & Lindley, 2014; Thoma & Huebner, 2014; Thoma & Huebner, 2018). Two studies included both male and female sexual minorities (Estes, 2017; Goldfarb, Lieberman, Kwiatkowski, & Santos, 2018) and one study included 3% transgender youth (Thoma & Huebner, 2018). Three studies included parents of sexual minority youth, and only one included parents of gender minority and sexual minority youth (Newcomb, Feinstein, Matson, Macapagal, & Mustanski, 2018). Over half of the studies reported high levels of racial/ethnic diversity (over 50% of participants reporting race/ethnicity as African American, Latino, and/or Asian) (Bouris et al., 2015; Feinstein et al., 2018; Flores et al., 2018; LaSala, 2015; Rose et al., 2014; Thoma & Huebner, 2014).

Themes

Six principal communication themes emerged across studies. These included: 1) limited communication and barriers to communication, 2) the impact of SGM disclosure on communication, 3) HIV/STI focused communication, 4) heteronormative communication, 5) outcomes of communication, and 6) youth preferences for PASC. The term heteronormativity/cisnormativity refers to the assumption that being cisgender and heterosexual is normal and preferable to being a sexual or gender minority (Thomson & Katz-Wise, 2019). In this review, heteronormative will be used as an umbrella term that includes cisnormative.

Limited communication and barriers to communication. The majority of studies described youth perceptions that PASC was infrequent, brief, and vague. Most youth stated that conversations about sex were infrequent or nonexistent (Estes, 2017; Feinstein et al., 2018; Goldfarb et al., 2018). In a sample of gay, bisexual, and queer youth, 70% recalled one or two instances of PASC, usually around the time of puberty (Flores et al., 2018). Similarly, Estes (2017) reported that 60% of youth had little to no PASC, and "sex was kind of a forbidden topic" (p. 620). Thoma and Huebner (2014) noted low levels of PASC in their sample, reporting an average level of 0.51 on a scale of 0 – 2 (0= *not at all* and 2= *several times*). However, Rose et al. (2014) reported moderate PASC; 17% of youth reported discussing "sexual behavior at least once a week" (p. 328) and 34% report discussing "HIV at least once a month" (p. 328). In LaSala's (2007) study, 83% of parents reported regular PASC about safer sex, although the meaning of 'regular' was not defined.

The majority of studies did not report on level of detail or specificity of information included in PASC. However, LaSala (2015) and Goldfarb et al. (2018) reported a specific lack of in-depth discussion about safer sex. Parents often communicated with "short, one-sided missives" such as "use protection" (Goldfarb et al., 2018, p. 41) or simply gave their child a condom with little to no direct discussion (LaSala, 2015). A male youth recalled: "Last year I was home for a break and there was a condom… and my dad was like 'Always use those' as a joke and that was the only conversation we have ever had" (Goldfarb et al., 2018, p. 41). These messages were notably absent for lesbian or bisexual young women in Goldfarb et al.'s (2018) study, although it was not clear whether this omission was specific to messages about protection or reflected a more general lack of communication. LaSala (2015) also noted conflicting reports from youth and parents; youth tended to report vague, one-sided warnings from parents about the

risk of contracting HIV and urgings to use condoms, while parents were more likely to report interactive discussions.

Two major barriers of communication were noted across studies: lack of comfort talking about sex and lack of knowledge about sexual behaviors. Discomfort was cited as a major barrier to PASC in six qualitative studies (Estes, 2017; Feinstein et al., 2018; LaSala, 2007; LaSala, 2015; Newcomb et al., 2018; Rose et al., 2014). Youth also reported barriers such as fear and anxiety, with one participant going so far as to compare PASC to entering the "lions' den" (Rose et al., 2014, p. 325). Mothers in the Rose et al. (2014) study reported varied levels of discomfort; one mother said, "There's nothing we can't talk about" (p. 326), and another stated, "the fact that my son was gay and was actually admitting he was gay—it's exceptionally uncomfortable" (p. 324). In contrast, fathers (n=2) reported that their discomfort with their son's sexual orientation prevented them from discussing sex (Rose et al., 2014).

Lack of knowledge was another consistent barrier to PASC (Estes, 2017; Feinstein et al., 2018; Flores et al., 2018; Newcomb et al., 2018; Rose et al., 2014). Specifically, Flores et al. (2018) reported that 40% of youth perceived that their parents lacked sufficient knowledge and had not attempted to educate themselves about SGM sexual behavior after their child disclosed to them, while about 37% of youth reported that their parents had educated themselves about SGM-specific issues. Additionally, 23% of youth could not gauge their parent's knowledge base due to an almost complete lack of communication (Flores et al., 2018). Newcomb et al. (2018) highlighted a different yet equally important gap in parental knowledge: parents of lesbian and bisexual female adolescents were more likely to acknowledge a knowledge deficit than parents of other SGM youth groups. Similarly, 33% of youth in the Estes (2017) study reported a lack of parental knowledge regarding female-to-female sexual behavior. "I think [my parents] … knew

almost nothing about sexually transmitted diseases as far as with the lesbian community," a participant stated (Estes, 2017, p. 621).

The impact of SGM disclosure on communication. Disclosure of SGM status to parents affected PASC. The majority of youth across studies had disclosed their SGM identity to their parents; however, a small number of adolescent participants had not. According to Feinstein et al. (2018), youth who had not disclosed reported that they rarely or never spoke with their parents about sex. Often these youth said that their parents had made negative comments about SGM people and therefore they could not initiate conversations about sex because they feared a negative response from their parents.

Three studies reported on youth perceptions of changes in PASC after disclosing their sexual identity to their parents. The experiences of these youth varied greatly across studies. Rose et al. (2014) stated that many youth recalled being extremely uncomfortable discussing issues of sexual identity before disclosure, but disclosure reduced strain and facilitated generally positive communication with parents about their sexual identity. In contrast, youth in Feinstein et al.'s (2018) study reported that communication generally became less common and less supportive following disclosure. For example, one youth said: "I went ahead and told my parents I had a boyfriend…. They immediately told me I was going to die from HIV/AIDS if I continue to be gay" (Feinstein et al., 2018, p. 1829). Similarly, another youth wished that parents would refrain from using stereotypes in their conversations: "Every time we say 'gay' to them, it's 'HIV'" (Rose et al., 2014). However, almost 50% of the youth in the Flores et al. (2018) study reported that the bulk of PASC occurred after disclosure. For some youth, the increase in PASC post disclosure was annoying because SGM identity was the reason that parents took a sudden interest in their sex life, worrying about HIV and safe sex (Flores et al., 2018). One youth

recalled that his mother did not speak about sex until he disclosed that he was gay: "All she kept saying was, '…Be safe. I don't care that you're gay but I wanna make sure that you're safe and that you're practicing safe sex.' And I would say, 'You can stop now!'" (Flores et al., 2108, p. 14). Lastly 17% of youth recalled a complete absence of conversation related to same-sex attraction or sexual identity after disclosure (Flores et al., 2018).

One quantitative study examined disclosure and its impact on frequency of PASC. Thoma and Huebner (2014) hypothesized that parents would speak to their children about sex less often after disclosure. However, they found that outness was not associated with frequency of communication, and parents rarely talked about sex, regardless of disclosure.

HIV/STI focused communication. Messages about HIV risk and using condoms were the most commonly reported topic of PASC (Feinstein et al., 2018; Flores et al., 2018; Goldfarb et al., 2018; LaSala, 2007; LaSala, 2015; Newcomb et al., 2018). Bouris et al. (2015) noted that youth reported that discussions about condoms ($M = 4.14$) [1 = *never* to 5 = *all the time*] were most frequent, followed by STIs and HIV/AIDS ($M = 3.53$). Goldfarb et al. (2018) reported that for some male youth, the only messages they received were to use protection. Newcomb et al. (2018) reported that 77% of parents discussed using protection and 48% talked about sex-related health risks. According to Rose et al. (2014), 64% of youth reported discussions about HIV and 59% about sexual behavior. LaSala (2007) reported that 80% of parents acknowledged "a persistent fear" (p. 51) that their sons would become HIV-infected.

A few of the studies included topics related to relationships and obtaining consent before sex, but these topics were rarely discussed. According to Newcomb et al. (2018), 19% of parents reported talking about the importance of consent and 35% discussed "getting to know partners before sex" (p. 115). Similarly, one youth in Feinstein et al.'s (2018) study said: "[my parents]

… said not to just have sex with random people, to know someone for at least 5 months" (p. 1831). Parents of transgender youth also reported warning their children to be careful about when and to whom they revealed their transgender identity while dating (Newcomb et al., 2018). Feinstein et al. (2018) reported that some PASC focused on coping with the ending of a relationship. In contrast, Goldfarb et al. (2018) highlighted the absence of talk about "love, intimacy, emotions, or relationships in the decision to have sex" (p. 42) reported by both sexual minority and heterosexual/cisgender college students.

Heteronormative communication. In two studies (Flores et al., 2018; Goldfarb et al., 2018), youth described PASC before disclosure as less supportive and informative because their parents assumed that they were heterosexual. Over 80% of participants in one study reported either no conversations about "same-sex attractions and other sexual orientations" or "negative comments… about LGBTQ people" (Flores et al., 2018, p. 14). "In my case, from the conversation [about sex with parent], it's almost like gay sex doesn't exist, you know?" (p. 15) recalled a youth from Flores et al. (2018) study. Participants in other studies gave examples of parents asking their gay sons if they had a girlfriend or only discussing topics of relevance to heterosexuals, such as how conception occurs or preventing pregnancy (Estes, 2017; Flores et al., 2018; Feinstein et al., 2018). A female youth reported, "I always believed my mom kind of had an idea about me being a lesbian but she kept on saying boys and girls, men and women, shouldn't touch, you shouldn't do anything until you're married and she just kept using that" (Estes, 2017, p. 620).

Even after disclosure, relevant SGM sexual health information may be left out of PASC. Estes (2017) reported that parents continued to discuss only heterosexual sexual behavior after their child came out. One 15 year-old bisexual male recalled, "[When] I had a girlfriend… my

mother lectured me greatly and urged me to use protection due to the fact she could get pregnant….I find it strange that my mother would not discuss the other things that come along with unprotected sex, like STDs, when I was in an intimate relationship with a male. I feel as though she thought that because neither of us could get pregnant that there was no danger. This unsettles me greatly" (Feinstein et al., 2018, p. 1831). Newcomb et al. (2018) reported that most parents asserted that their conversations about sex with their children were the same, regardless of sexual or gender identity, which could indicate omission of SGM-specific information. In Bouris et al.'s (2015) study, youth reported that same-sex sexual behavior was discussed, but on average at a lower rate than opposite-sex sexual behavior; in this sample of mostly gay males, 'sex with a female' ($M = 2.75$) was discussed as much if not more than 'sex with a male' ($M = 2.49$).

Interestingly, youth in Feinstein et al.'s (2018) study felt that their parents showed more interest in the dating lives of their heterosexual children than in the dating lives of their SGM children. Goldfarb et al. (2018) highlighted youth perceptions of parental disapproval or disappointment in their SGM identity. One youth stated, "Only thing was when my mom knew I was gay and I was seeing someone. She would cry and tell me to use condoms and not get an STD. She would just be crying…. That was the only message I got" (Goldfarb et al., 2018, p. 39).

Outcomes of Communication. Three quantitative studies examined outcomes of PASC. Bouris et al. (2015) found that among male gay or bisexual youth of color, maternal communication about sex with males increased the odds (odds ratio =2.36) of routine HIV testing. However, maternal communication about sex with females, STIs and HIV, or condoms was not associated with HIV testing. Participants also noted high levels of open communication

about their sexual orientation, but this factor was also not associated HIV testing (Bouris et al., 2015).

Thoma and Huebner (2014; 2018) also reported on the importance of maternal PASC. In 2014, these researchers noted that increased frequency of sex communication was associated with an increased likelihood of sexual risk behavior in the past six months. However, in 2018, they reported that if communication by mothers was "frequent, specific, high quality, and low in negative emotionality" (anger, frustration, upset, worried), then it was associated with "more positive attitudes about condoms, higher subjective norms, and higher perceived behavioral control" among male SGM youth (p. 982). Additionally, these positive attitudes and perceived norms were associated with increased condom use intentions. Paternal PASC was not associated with intentions to use condoms or sexual risk behaviors (Thoma & Huebner, 2018).

Youth preference for PASC. Most youth and parents viewed health-related communication between parents and adolescents as important (Rose et al., 2014), and youth expressed a desire to learn about sex from their parents (Feinstein et al., 2018). Flores et al. (2018) found that almost 97% of youth preferred to receive information about sex from their parents as compared to obtaining information from doctors, teachers, friends, or the internet. However, youth gave parents low ratings as sex educators (Flores et al., 2018) and parents described wanting to improve their sexual health knowledge and communication skills (LaSala, 2015). There was a disconnect between youth wanting the parents to initiate conversations and parents' desire for their child to do so (LaSala, 2015). When youth were asked to describe the informal criteria they used to rate PASC, they described giving parents a higher rating for initiating conversations and a lower rating for providing vague messages about 'being safe' without any details (Flores et al., 2018).

Discussion

Many youth and adults believe that PASC is important (Rose et al., 2014), and youth, particularly at younger ages, want to receive information about sexuality and sexual health from their parents (Flores et al., 2018; Rose et al., 2014). However, PASC in the studies reviewed tended to be (1) complicated by barriers to communication (i.e. lack of knowledge and comfort among parents), (2) limited in content and focused on HIV prevention, (3) heteronormative, and (4) influenced by adolescents' disclosure of SGM status.

Many of these findings are similar to prior research on PASC with heterosexual youth. For example, sex communication between parents and heterosexual youth is often infrequent and awkward (Coakely et al., 2017; Flores & Barroso, 2017; Widman et al. 2016), and barriers such as lack of knowledge and discomfort are faced by all families (Coakely et al., 2017). In earlier studies of PASC with samples of heterosexual parents and youth, adolescents cite parents as their most importance influence regarding decisions about sex (Albert, 2012; Ikramullah, Manlove, Cui, & Moore 2009). However, families with SGM youth face unique challenges when communicating about sex.

Lack of knowledge and high levels of discomfort have specific implications for families with SGM youth. Despite the need for further research, we speculate that reported discomfort may stem from talking about sex and relationships in general, negative SGM beliefs and attitudes, and/or a lack of knowledge about same-sex sexual behaviors. Heterosexual parents may be less aware of, comfortable with, and educated about same-sex sexual behaviors, which likely decreases effective communication. Among heterosexual adolescents PASC increased condom use, but only if the adolescent felt that their parent was open, skilled, and comfortable during discussions of sex-related topics (Whitaker, Miller, May, & Levin, 1999).

Messages about using condoms and risk of HIV acquisition were overwhelmingly the most common topic of PASC (Bouris et al., 2015; Feinstein et al., 2018; Flores et al., 2018; Goldfarb et al., 2018; LaSala, 2007; LaSala, 2015; Newcomb et al., 2018). Discussion of romantic relationships and dating safety issues may be lacking, yet the majority of studies reviewed did not fully explicate or examine the breadth of PASC topics discussed. Previous studies among heterosexual samples also suggest that emotions and relationships are relatively uncommon topics of PASC (Stiffler, Sims, & Stern, 2007; Wisnieski, Sieving, & Garwick, 2015). However, teens are often eager to explore these topics (Weissbourd, Peterson, & Weinstein, 2014). SGM youth are at increased risk of experiencing dating violence, including sexual coercion and physical and psychological abuse, and sexual coercion is experienced at almost twice the rate of heterosexual youth (23.2% v. 12.3%) (Dank, Lachman, Zweig, & Yahner, 2014). Transgender youth have reported high rates of dating violence, with 88.9% reporting experiences of physical violence as compared to 29.9% for all youth, and 61.1% reporting sexual coercion as compared to 13.0% for all youth (Dank et al., 2014). PASC should include discussion about relationships, consent and safety, and partner communication and negotiation.

Across several studies, sexual minority youth described sex communication as heteronormative before and after disclosure (Estes, 2017; Flores et al., 2018; Feinstein et al., 2018). Before disclosure, parents assumed their child was heterosexual and failed to discuss same-sex attraction, relationships, and sexual behavior (Estes, 2017; Flores et al., 2018; Feinstein et al., 2018). After disclosure, some parents failed to acknowledge their son's sexual orientation and did not speak about sex at all (Feinstein et al., 2018; Flores et al., 2018) or continued to speak only about heterosexual behavior (Estes, 2017). While previous studies have described

parents' desire to ensure the heterosexual development or socialization of their sons (Coakley, Randolph, Shears, & Collins, 2017; Solebello & Elliott, 2011), the qualitative studies in this review highlighted the persistence of heteronormativity in sex communication even among SGM youth. To date we are unaware of any quantitative research measuring the effects, extent or frequency of heteronormativity in PASC.

The impact of youth SGM disclosure on PASC was variable and less understood. Youth perceptions of how PASC changed after SGM disclosure were inconsistent (i.e. more comfortable and supportive communication or less comfortable and supportive). Family acceptance is associated with greater self-esteem and overall improved general health (Ryan et al., 2010), yet the impact of parental acceptance, ambivalence or rejection of SGM identity on sex communication remains unclear. Parental acceptance of SGM identity may impact youth willingness to engage in conversations about sex, as research on heterosexual adolescents suggests that those who feel supported by their parents may be more receptive to communication (Wight & Fullerton, 2013; Guilamo-Ramos et al., 2016).

Limitations and Directions for Future Research

This review includes both qualitative and quantitative studies and provides a comprehensive summary of research focused on PASC among families with SGM youth, particularly gay and bisexual male youth. No studies focused on the role of fathers or PASC among families with sexual minority females or transgender/gender nonconforming youth. The majority of studies had racially diverse samples; however, potential differences in PASC based on race/ethnicity or culture were not explicated. There was limited geographic (rural vs urban) and regional diversity and quantitative studies lacked longitudinal data. Lastly, parents who are supportive of a child's SGM status are more likely to participate in research, and this bias may be

particularly present in studies comprised of youth-parent dyads (LaSala, 2007; LaSala, 2015). Future research should include greater diversity of samples and should seek to uncover the impact of multiple minority status (intersection of race/ethnicity and SGM), cultural variations, and diversity of parental viewpoints, including parents who are unsure or have negative attitudes and beliefs towards their child's SGM identity.

Currently, the development of one intervention focused on PASC between parents and SGM youth has been described in the literature (Flores, Rosario, Bond, Villarruel, & Bauermeister, 2020). No other interventions have been identified (Feinstein et al., 2018; Santa Maria, Markham, Bluethmann, & Mullen, 2015). Given the complex nature of PASC, multiple facets of the construct should be examined to inform ongoing intervention work. These include: perceptions of heteronormativity, frequency and content of discussions, level of education and comfort for parents, and emotional tone of conversations. Additionally, PASC should include relationships and dating safety.

The nature and impact of heteronormative discussions on SGM sexual health outcomes is not well understood; measures of PASC that differentiate between communication about same-sex and opposite-sex attraction, relationships, and inclusivity of other SGM sexual health concerns are needed. Studies should explore the impact disclosure has on PASC and examine whether parents can effectively communicate information about sex while also expressing conflicted or negative feelings toward their child's sexual orientation (Bouris et al., 2010).

Implications for practice

Understanding PASC is important for developing theory-driven, culturally appropriate interventions that will support and improve sex communication between parents and SGM youth. Health care providers can guide parents and SGM youth by fostering open and positive sexual

health conversations and breaking down the barriers associated with heteronormative sexual health communication and education. Guidelines from the American Academy of Pediatricians (AAP) suggest that health care providers encourage parents to begin discussions about sexuality and contraception when children are young and model initiation of these talks during suitable moments, such as when a sibling is born (Breuner & Mattson, 2016). Education and resources for skill building to promote comfort and increase knowledge for parents should be provided. Important aspects of PASC should include positive and affirming conversations about: identity formation and support; healthy relationships; communication and negotiation for safer sexual behaviors; sexual consent; contraception; and STI/HIV prevention. Additional resources for youth and parents are provided in Box 1.

Conclusion

The small yet growing body of PASC research with SGM youth suggests that these youth do not receive adequate parental education and guidance regarding sexual health and relationships. Health providers can make a difference by (1) initiating inclusive sexual health education in clinic, and (2) providing education and additional resources to support parent knowledge about SGM relationships and sexual behaviors as well as increasing comfort levels for engaging in these discussions with their adolescent youth.

Box 1

Search terms listed by category [a]

List of keyword search terms by category:

- Family: family, parent*, mother, father, maternal, or paternal and keywords related to youth were youth, teen, teenager, adolescent, or child
- Youth: youth, adolescent, teen, teenager, child
- Communication: communication, discussion, conversation, talk*, or language.
- Sex and sexual health: sex or sexuality or sexual activity or sexual intercourse or sexual behavior or sexual health or intimacy
- SGM: lesbian, gay, homosexual, bisexual, LGB*, GLB*, transgender, queer, "sexual gender minorit*", "sexual minorit*", “sexual identity,” or “sexual orientation”

[a] Asterisks at the ends of words or parts of words were used to ensure that all variants were included.

Box 2: Resources for Parents and Youth that Support PASC

Resources for Parents and Youth that Support PASC

- Kids-Ask.org is a website designed for parents of children ages 3-12 years old. It provides a template for parents to build personalized scripts appropriate for their child’s age to guide them in responding to a question or starting a conversation about sex and sexual health. The website is optimized for mobile device access and parents are able to save their script for later reference on a mobile device if desired. Kids-Ask addresses a range of topics including Gender and Sexual Identity, Relationships, and Protection and Birth Control.
- Amaze.org is a website designed for youth ages 3 and older, parents, and educators. It provides information on nine topics, including sexual orientation, gender identity, health relationships, personal safety, and specifically for adults, “Having the Talks.” Among the website’s offerings are short, engaging animated videos for youth and

conversation starters and key message scripts for parents on many topics (including pornography, relationships, and masturbation), which are available in a PDF format.

- A fact sheet titled “Parents’ Influence on the Health of Lesbian, Gay, and Bisexual Teens: What Parents and Families Should Know” is available in PDF format from the CDC website. This resource is a comprehensive three-page fact sheet that highlights the importance of positive family environments to the health of SGM youth and offers evidence-based actions for parents, including specific ways to talk and listen, provide support, and stay involved. This fact sheet can be accessed via this link: .cdc.gov/healthyyouth/protective/pdf/parents_influence_lgb.pdf

Table 1: Study Methods and Findings

Author/Year	Purpose	Sample	Method	PASC-related Findings
Bouris, Hill, Fisher, Erickson, & Schneider (2015)	Describe the frequency of mother-son sex communication about specific topics, including same-sex behavior and sexual orientation; Examine the associations between frequency of mother-son sex communication about specific topics and routine HIV testing	135 males 100% cisgender Ages 13-19 years 84% Black/African-American 5% Latino 4% Black and Latino 7% multiracial 66% gay, queer, or same-gender loving 31% bisexual 3% other or heterosexual Project READY, Chicago, Illinois	Cross-sectional survey; oral rapid HIV antibody test	Mother-son communication about sex with males was the only PASC topic associated with a greater probability of regular HIV testing. Maternal communication about other topics, such as condoms and HIV, openness about sexual orientation, and maternal warmth were not associated with routine HIV testing.
Estes (2017)	Explore sexual minority young adult experiences with PASC and school-based sex education	10 young adults: 6 females, 4 males Ages 19-25 years 80% White, 10% African-American, 10% multiracial 40% gay, 30% lesbian, 20% pansexual* lesbian, 10% bisexual 80% were from a large university in the southeastern U.S.	Semi-structured Interviews	Youth reported perceptions that their parents rarely talked about sex, lacked knowledge about same-sex behavior, and were uncomfortable discussing sex. Communication that did occur focused on heterosexual behaviors, even if parents knew their child was not heterosexual.
Feinstein, Thomann, Coventry, Macapagal, Mustanski, & Newcomb (2018)**	Describe gay/bisexual male youth perceptions of how their sexual identity affects relationships with parents, communication about sex and dating, and parent	52 males 100% Cisgender Ages 14-17 years 42% White, 33% Latino, 10% Black, 6% Asian 69% gay, 31% bisexual	Online focus groups	76% of youth reported that being gay or bisexual had an impact on communication with parents about sexual health. Most youths stated that they had talked about sex “at least once” but conversations were “vague and uncomfortable.” The most common reported topic was condom use and HIV. Youths reported that after

	monitoring of dating behaviors	National online sample		coming out, communication about sex and dating became "less frequent and supportive." Youth who were not out to their parents often reported very little sex communication and that they couldn't talk about sex or dating with their parents. Parents assumed they were heterosexual, which made them uncomfortable.
Flores, Docherty, Relf, McKinney, & Barroso (2018)	Describe parent-adolescent sex communication from the perspective of gay, bisexual, and queer adolescent males	30 males Ages 15-20 years 13% Asian, 13% Black, 33% Latino, 3% Multiracial, 37% White 77% gay, 17% bisexual, 7% queer North Carolina	Semi-structured interviews	Youths reported that their parents rarely talked to them about sex. Before disclosure, parents assumed their children were heterosexual and conversations reflected that assumption. After disclosure, parents tended to focus on the threat of HIV and STIs. Youths reported that they preferred to obtain information about sex from their parents, although they reported that their parents lacked SGM-relevant knowledge and gave their parents low ratings as sex educators.
Goldfarb, Lieberman, Kwiatkowski, & Santos (2018)	Describe heterosexual and sexual minority youth perceptions of messages and communication about sex with parents that occurred before first having sex	74 university students: 53% female, 47% male 100% cisgender Mean age of males = 18.6, mean age of females = 18.9 years 64% White, 10% African American, 13% Hispanic, 5% Asian, 8% Multiracial/other 16% sexual minority University in Northeastern region of U.S.	Focus groups	Sexual minority young adults reported fear of parental discovery of their sexual minority identity and that parents expressed disappointment when they found out about their children's sexual minority identity. Minimal communication about sex occurred, and about 45% reported difficulty talking with parents about sex. Among male SM, the most common message, and often the only message, was to use protection. No female SM reported this message.
LaSala (2007)	Describe parent and youth perceptions of communication about HIV;	30 males and 35 of their parents Youth: Ages 16-25 years	Interviews; youths and parents were	Most parents reported a continual fear that their sons would become infected with HIV and regular but awkward discussions about safer sex.

	Explore how parents may influence their gay sons' sexual risk behaviors	60% White, 23% Black or biracial, 13% Latino, 3% Asian 100% gay New York City and Philadelphia (metropolitan areas), New Jersey	interviewed separately	Parents reported that they persisted in having the conversations despite their sons' resistance. Seventeen youths reported that their families positively influenced their intentions to engage in safer sex. Two of these youths mentioned positive communication with parents and thirteen reported feeling obligated to parents to engage in safer sex. Youths with troubled family histories tended to report no family influence on their sexual risk behavior.
LaSala (2015)	Describe parent and youth beliefs about how families encourage or discourage gay and bisexual youths to reduce sexual risk behaviors	38 males and 45 of their parents/care-takers Youth: Ages 14-21 years 37% Black, 31.5% Latino, 31.5% White 87% gay, 13% bisexual New York City and Philadelphia (metropolitan areas), New Jersey	Semi-structured interviews; youths and parents were interviewed separately	About 53% of youth reported that their families influenced their sexual behaviors, and 90% of these youth reported that their parents communicated directly about HIV risk. About 25% of youth reported no family influence and no family discussions about HIV. Parent and youth descriptions often conflicted. Many youth reported vague, one-sided, yet influential warnings to use condoms, while parents tended to report more open, interactive conversations. Parental discomfort was a frequently mentioned barrier to PASC.
Newcomb, Feinstein, Matson, Macapagal, & Mustanski (2018)**	Describe parent perceptions of communication about healthy sexuality with LGBTQ adolescents; Describe parent perceptions of their relationship with their youth and how they monitor the dating and sexual behavior of their adolescents	44 parents of SGM youth Parents: 95% Cisgender female 2% Cisgender male 2% Genderqueer/ gender nonconforming 95% White 2% Hispanic/Latino 2% More than one race	Online focus groups	Barriers to discussion included lack of knowledge and discomfort, with parents of cisgender females more likely to endorse a lack of knowledge. 77% of parents reported talking to their youth about using condoms, 48% reported talking about sex-related health risks, and 19% discussed consent. The majority of parents reported that they gave the same advice to their heterosexual and non-heterosexual children. 59% of parents reported becoming more worried about their teen

		84% heterosexual, 11% bisexual, 5% other Youth: 41% transgender or gender nonconforming, 39% cisgender male, 20% cisgender female Ages 13-17 years 50% gay/lesbian 23% bisexual 11% Queer 11% Unsure/questioning 5% Heterosexual (same-sex attracted) National online sample		after disclosure, particularly an increased fear of SGM youth victimization. Parents of transgender youth were more likely to discuss consent, disclosure, and fears about physical safety during conversations about dating.
Rose, Friedman, Annang, Spencer,& Lindley (2014)	Describe young adult and parent perceptions of communication about health; Describe parent and young adult recommendations to improve health-related communication between parents and youth	42 males and 10 parents (not necessarily a member of a parent-child dyad) Youth: Ages 18-21 100% African-American 100% gay Parents: 80% female 20% male 90% African-American 10% multiracial Southeastern U.S. (metropolitan area)	Mixed methods: Focus groups with youth; individual interviews with parents; cross-sectional survey	76% of youth and 90% of parents agreed that health communication was moderately to very important. Youth-reported barriers include personal fear, embarrassment, and lack of parental knowledge. 50% of parents reported lack of knowledge but most denied discomfort as a barrier. When asked about conversation topics, 81% of youth reported sexual orientation and 64% reported HIV. 17% of youth reported at least weekly discussions about sexual behavior and 34% reported at least monthly discussions about HIV. Recommendations for parents included preparing with resources, avoiding stereotypes and initiating conversations.

Thoma & Huebner (2014)	Examine associations between parent awareness of a son's sexual orientation and frequency of PASC and parental monitoring; Examine associations between PASC and monitoring and youth sexual risk behaviors; Examine differences in communication and monitoring related to differences in levels of outness to parents.	257 males 100% cisgender male Ages 14-19 years 35% Black/African-American, 30% mixed, 22% White/Caucasian, 13% something else (Latino, Asian, Pacific Islander, Native American) 67% gay 25% bisexual 8% queer or other Indianapolis, IN Boston, MA Philadelphia, PA Oakland, CA	Cross-sectional survey (in-person)	Higher levels of sex communication were associated with a 50% increase in likelihood of condomless anal intercourse in the past six months. Youth reported low levels of parental communication and there was no difference in communication levels depending on level of outness.
Thoma & Huebner (2018)	Examine associations between youth perceptions of PASC about condoms and determinants of condom use (attitudes about condoms, subjective norms, perceived self-efficacy, intentions to use condoms) and instances of condomless anal intercourse, using the Theory of Planned Behavior as a framework	838 males 97% cisgender 3% transgender or genderqueer Ages 14-18 years 53% White, 15% Black, 13% Latino, 2% Asian/Pacific Islander, 1% Native American, 16% mixed race/ethnicity 72% gay 28% bisexual National online sample	On-line cross-sectional survey	Maternal PASC that is perceived as frequent, specific, high quality (open and honest), and lower in emotions such as anger and worry is associated with improved attitudes toward condoms, higher subjective norms, and increased self-efficacy toward condom use. Higher levels of positive attitudes and norms are associated with higher intentions to use condoms and indirectly associated with reduced risk of condomless anal intercourse. Paternal PASC is not associated with condom use intentions or behaviors.

*The term pansexual means a sexual or nonsexual attraction to a person's personality.
** The Feinstein et al. (2018) and Newcomb et al. (2018) studies were conducted in parallel.

References

Refer to Cumulative Reference List

Chapter 3:

Associations between Sex Education Types and Sexual Behaviors Among Female Adolescents: A Secondary Data Analysis of the National Survey of Family Growth 2011-2019

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This manuscript is intended to replace elements of the methods and results sections of the traditional dissertation. The primary author of this manuscript is Elizabeth Anne McKay; contributions included study conceptualization, acquisition of data, data analysis and interpretation, initial manuscript drafting, and manuscript revision and editing. Matias Placencio-Castro is the second author; contributions included acquisition of data, data analysis and interpretation, and manuscript revision and editing. Mei R. Fu is the third author; contributions included study conceptualization and design and manuscript revision and editing. Holly B. Fontenot is the fourth author; contributions included study conceptualization and design, data analysis and interpretation, and manuscript revision and editing. ***This manuscript was published in Sexuality Research and Social Policy****, a journal which publishes articles on research, theory and methodology, and policy related to sexual health, sexuality education, and sexual rights for an international multidisciplinary audience. This journal is peer-reviewed and has an impact factor of 3.618 (2020). This manuscript represents a significant contribution to the dissertation work.*

Abstract

Introduction: Sex education is important to support healthy sexual development/behaviors among heterosexual and sexual minority youth. Efforts to assess the efficacy of different sex education programs have been complicated by the lack of an established and detailed way to characterize overall sex education content.

Methods: This study delineates seven different types of sex education and compares the impact of education types on the probability of sexual intercourse and contraceptive method use among a nationally representative sample of females aged 15-19 years. Data were obtained from four National Survey of Family Growth surveys (2011-2019). Multinomial logistic regression was used to examine associations and calculate predicted probability values.

Results: Among youth in this analysis (N=3952), 14.9% identified as a sexual minority and 72% reported sex education including refraining from sex, contraception, and STIs/HIV. Compared to their heterosexual peers, sexual minorities were more likely to report no sex education and less likely to report receipt of abstinence-only education. All types of education, except education solely focused on refraining from sex and contraception methods, had a statistically significant effect on sexual behavioral outcomes (intercourse in the past 12 months and type of contraceptive use) as compared to no sex education.

Conclusions: Findings highlight the need for consideration of the specific/total content of sex education, benefits/drawbacks of sex education types, and the needs of sexual minority youth.

Policy Implications: Research is needed to further explore outcomes associated with specific curricular content. Specific content of sex education should be considered prior to making curricular policies decisions.

Introduction

By age 18 years almost two-thirds of youth in the United States have had sexual intercourse (Guttmacher Institute, 2019). Pregnancy and sexually transmitted infections (STIs) are a concern for all sexually active female youth. Unintended teenage pregnancy rates, although decreasing due to improved contraceptive use, are higher in the United States than in other high-income countries with reliable data (Lindberg et al., 2018; Sedgh et al., 2015). Each year, a disproportionate number of newly acquired STIs occur in youth ages 15-24 (CDC, 2017). Sexual minority female adolescents face increased risks of pregnancy and STIs. Compared to their heterosexual peers, sexual minority adolescents are more likely to become pregnant (Charlton et al., 2013; Charlton et al., 2020; Everett et al., 2019), less likely to use condoms (Everett et al., 2019; Phillips II et al., 2020), and report higher numbers of male sexual partners (Ela & Budnick, 2017; Tornello et al., 2014).

Providing education to both heterosexual and sexual minority adolescents about a range of sexual health topics is an important way to address these health concerns and support healthy sexual development (CDC, 2020; Kirby, 2008). Sex education is typically classified as either abstinence-only, which focuses on the importance of delaying sex and offers little to no discussion about contraception, or comprehensive, which includes information about both contraception and the benefits of abstinence. Decisions about which kind of sex education model to adopt are made at the state and local levels, but federal financial support exerts significant influence on programming decisions (Kaiser Family Foundation, 2018). The content and goals of sex education have been the subject of longstanding debate in the United States (Chin et al., 2012; Hall et al., 2016). Despite widespread consensus among public health researchers that

most abstinence-only programs are ineffective (Santelli et al., 2017), a significant amount of federal spending has supported abstinence-only education since the early 1980s (Rabitte & Enriquez, 2019; Kaiser Family Foundation, 2018). A major expansion of federal funding for abstinence-only programs began in 1996 with the passage of the Welfare Reform Act; this legislation specifically prohibited the discussion of contraception except to highlight their failure rates (Kaiser Family Foundation, 2018, Rabitte & Enriquez, 2019; Santelli et al., 2017). Federal spending on abstinence-only programs grew rapidly, with every state except California obtaining funding at some point (Kaiser Family Foundation, 2018; Santelli et al., 2017). By 2004, however, an increasing number of states began to refuse funding amid concerns that abstinence-only programs did not reduce sexual activity, promoted inaccurate medical information, and were not receiving proper governmental oversight; almost half the states declined federal abstinence-only funding in 2009 (Santelli et al., 2017).

As part of the Affordable Care Act in 2010, Congress shifted the focus of funding toward evidence-based interventions and away from abstinence-only models (Kaiser Family Foundation, 2018; Santelli et al., 2017; Schalet et al., 2014). Since then, sex education curricula have continued to evolve and levels of federal funding for both types of instruction have fluctuated with each presidential administration, with just under a third of federal spending on sex education supporting abstinence-only programs in 2017 (Kaiser Family Foundation, 2018).

Given the changes in federal funding streams and renewed focus on evidence-based interventions since 2010, an updated analysis of the prevalence and effectiveness of different types of sex education across the country is warranted. The National Survey of Family Growth (NSFG) and the Youth Risk Behavior Survey (YRBS) are two nationally representative data sets that have been used to track national patterns and provide correlational evidence about the

impact of different types of sex education programs. These efforts are complicated by the lack of an established, systematic, and thorough way to assess and characterize sex education content, however. Most studies using these data sets have relied on only one or two questions to assess content, potentially missing important differences in the information and messaging conveyed. Exposure to HIV education has been commonly assessed with a single question from the YRBS asking respondents if they had ever been taught about AIDS or HIV infection in school (Demissie et al., 2018; Ma et al., 2014; Phillips II et al., 2020, Raifman et al., 2018). These studies suggest that high school students who were exposed to HIV education were more likely to use a condom (Demissie et al., 2019; Ma et al., 2014) and any contraceptive method at last intercourse compared to students without HIV education (Demissie et al., 2019). Several studies using 2002 NSFG data have relied on one or two questions to label programs as abstinence or comprehensive and compare associated health outcomes. One study found that comprehensive, but not abstinence education, was associated with a decreased likelihood of teen pregnancy (Kohler et al., 2008), while another found that birth control-only instruction but not abstinence-only or instruction in both topics was associated with use of a reliable contraceptive method at first intercourse but not use of any contraceptive method at first intercourse (Isley et al., 2010). Since 2002 the NSFG has added five survey questions about sex education content and currently inquires about exposure to seven different topics including methods of birth control, how to say 'no' to sex, and sexually transmitted infections (STIs).

One known study has looked for associations between each of the seven topics and sexual behavior outcomes. The study authors concluded that receipt of instruction about two topics, how to say 'no' to sex and birth control methods, was positively associated with dual method use in sexually active adolescent males (Jaramillo et al., 2017). This approach, however, does not

take into account the total content received by the individual and assumes that the impact of a program can be understood as the sum of its individual components, ignoring synergistic or subtractive effects that may occur when topics are taught together. Thus a more detailed yet efficient way of describing the total educational content received by an individual is needed to extend current understanding. Finally, few studies have examined the impact of sex education on sexual minorities; most have focused on adolescent males and presented conflicting findings (Nelson et al., 2019; Phillips II et al., 2020; Raifman et al., 2018; Rasberry et al., 2018). Regarding females, the only known study concluded that education in how to say 'no' was associated with increased likelihood of pregnancy and an increased number of male sexual partners in sexual minority but not heterosexual female youth (Bodnar & Tornello, 2019).

Given the continued need to evaluate the impact of different sex education types and consider their specific impact on sexual minority populations, the purpose of the study was three-fold: (1) devise a parsimonious way to effectively use NSFG data to describe the total sex education content received by an individual, (2) provide an updated, detailed assessment of the prevalence and impact of different sex education types on sexual intercourse and contraceptive behavior of adolescent females, and (3) examine differences by sexual identity— whether reports of exposure to sex education vary by sexual identity and whether sexual identity modifies the relationship between education type and sexual behavioral outcomes.

The NSFG survey asks females about whether they have performed or received oral sex with another female or had "any sexual experience of any kind with another female." However, the survey does not ask about protective methods used, which is the focus of this study. Due to this lack of data and the risks of pregnancy and STIs associated with male-female sexual intercourse, this analysis focused on male-female sexual intercourse behavior.

Methods

Data Source

The National Survey of Family Growth collects data about family life, pregnancy, contraceptive use and other sexual and reproductive health topics from a nationally representative sample of men and women ages 15-49. The data are gathered through both in-person interviews and a self-administered, computer-aided interview program. The NSFG uses a complex sampling strategy to create a multi-stage, stratified, area probability sample that enables the calculation of nationally representative estimates. The NSFG website provides additional detailed information about the sampling methodology (NSFG, 2020).

Study sample

Data were obtained from the four NSFG surveys administered over the 2011-2019 period. Females ages 15-19 years were included in the analytic sample. Respondents reporting instruction in birth control topics only (n=12) were excluded from the final regression model because the small sample size prevented the model from converging, and those missing responses on sex education survey items were excluded (n=6) as well. After these exclusions, the total sample size was 3952 females. The response rate for all females was 73.4% in 2011-2013 and ranged from 66% in 2017-2019 to 70.7% in 2013-2015 among female teenagers.

Measures

Types of formal sex education. The NSFG survey asked respondents if they had formal instruction before age 18 years “at school, church, a community center, or some other place” about seven different topics: how to say no to sex, methods of birth control, where to get birth control, how to use a condom, sexually transmitted diseases, how to prevent HIV/AIDS, and waiting until marriage to have sex. These items were grouped into three content categories: (1)

refraining from sex (saying 'no' and waiting until marriage), (2) contraception (methods of birth control, where to find birth control, and how to use a condom), and (3) STI/HIV (STIs and how to prevent HIV/AIDS). These three categories reflect Healthy People 2030's family planning objective (FP-08) to "increase the proportion of adolescents who receive formal instruction on delaying sex, birth control methods, HIV/AIDS prevention, and sexually transmitted diseases before they were 18 years old" (Office of Disease Prevention and Health Promotion [ODPHP], n.d.). Although each content category contains two to three specific topics, respondents need have received education in only one topic to be regarded as having exposure to that category.

The three categories have seven different possible combinations. Each combination represents a different possible 'type' of sex education: (1) Refraining from sex only, (2) Contraception only, (3) STIs/HIV only, (4) Refraining from sex and contraception only, (5) Refraining from sex and STIs/HIV only, (6) Contraception and STIs/HIV only, and (7) Refraining from sex, contraception, and STIs/HIV. Respondents were classified according to which specific type of sex education they received. The education types are listed in Box 1 as a reference for the reader.

Occurrence of sexual intercourse and contraceptive method use. The NSFG contains multiple questions about current and past sexual activity and contraceptive use. To determine whether respondents had engaged in male-female sexual intercourse during the past twelve months, those who endorsed ever having sex with a man were asked, "During the last 12 months, that is, since [*the date one year ago*], how many men, if any, have you had sexual intercourse with? Please count every male sexual partner, even those you had sex with only once." If respondents reported at least one male sexual partner in the past twelve months, they were asked,

"Looking at Card 33, the [*time / last time*] you had intercourse with [*last partner*], in [*date of sex with last partner*], did you or he use any method?" Respondents who answered yes were asked, "Which method or methods on Card 33 did you or he use?" Card 33 listed 22 different response choices, including the pill, condom, withdrawal, hormonal injection, hormonal implant such as Norplant or Nexplanon, IUD, calendar rhythm method, safe period by temperature or cervical mucus test, female or male sterilization operation, female condom, diaphragm, jelly or cream, contraceptive patch, contraceptive ring, suppository or insert, emergency contraception, and other method. Respondents could report up to four methods.

Contraceptive methods regarded by the World Health Organization (WHO) as 'very effective' as commonly used (0-0.9 pregnancies per 100 women per year) or 'effective' as commonly used (1-9 pregnancies per 100 women per year) were classified as "effective." These included male or female sterilization, intrauterine device (IUD), and hormonal methods such as an implant, injection, pills, patch or ring (WHO, 2020). Methods associated with more than 9 pregnancies per 100 women per year as commonly used (other than condoms) were classified as ineffective, including the following: withdrawal, fertility-awareness based methods, female condom, and jelly or foam. Since the condom provides protection against STIs and moderately effective protection against pregnancy (13 pregnancies per 100 women as commonly used; WHO, 2020), 'condom use only' was categorized separately from other methods. Dual method use was defined as an effective method plus condom use at last sex.

These responses were combined into a single variable according to whether the respondent had sexual intercourse within the past 12 months and if so, what type of contraception was used at last intercourse. The five mutually exclusive responses were: (1) no sexual intercourse, (2) intercourse with no method or with an ineffective method, (3) intercourse

with a condom only, (4) intercourse with a hormonal or other effective method only or (5) intercourse with dual method (hormonal or other effective method with a condom).

Sexual identity. Respondents were asked one of two questions to assess sexual identity. In the 2011-2013 survey, all respondents were asked, "Do you think of yourself as…" with the following response options: heterosexual or straight, 'homosexual, gay, or lesbian,' bisexual, not ascertained, refused, and don't know. In surveys spanning 2013-2019, a random half of respondents was asked the previous question and the other half was asked, "Which of the following best represents how you think of yourself?" Response options were lesbian or gay, 'straight, that is, not lesbian or gay,' bisexual, something else, not ascertained, refused, or don't know. Responses of heterosexual or straight were categorized as heterosexual and responses such as lesbian, gay, bisexual, or something else were categorized as sexual minority for this analysis. Responses of don't know (n=14), not ascertained (n=13), and refused (n=18) comprised 1.1% of the total sample and were removed from the data analysis. Respondents answering "don't know" were excluded because it is not known whether those respondents were questioning their sexual identity or did not understand the question.

Other sociodemographic characteristics. Sociodemographic variables included age at time of screening, race/ethnicity (black, white, other), residence (central city, other metropolitan area, or rural), household income relative to 200% of poverty level (<200% or ≥ 200% of poverty line), and age of mother at first birth ≤ 19 years, ≥20 years, or 'no mother figure/mother figure did not have children'). Participants were asked how often they usually attended religious services at age 14 with eight response options ranging from more than once a week to never or don't know. Responses were grouped as weekly or more often, sometimes (ranging from 2-3 times per month to 1-2 times per year) or never (Lindberg et al., 2016). Respondents who

endorsed living with the same two biological or adoptive parents since birth were classified by the NSFG as having an intact family unit. High-risk drug use in the last 12 months was assessed by four questions. Respondents were asked how often during the last 12 months they had used (1) cocaine, (2) crack, (3) Crystal or meth or (4) shot up or injected drugs other than those prescribed for them. The four response options (never, once or twice during the year, several times during the year, or about once a month or more) were collapsed into two categories that reflected whether or not respondents had any high-risk drug use in the past 12 months.

Statistical Analyses

The four two-year data files from 2011-2019 were merged and the 2011-2019 combined-file sampling weights were applied according to NSFG specifications (National Center for Health Statistics, 2020). To account for the complex survey design by incorporating sampling weights and design variables, data analysis was carried out in STATA 16.0 using the complex survey data command (svy) and the subpopulation option to yield accurate point estimates and standard errors. Statistical significance was set at $p \leq 0.05$. Frequencies, proportions, and means were calculated to describe the sample. Design-based results from Pearson's chi-square analyses were used to examine associations between sociodemographic characteristics, receipt of specific sex education types, and sexual behavioral outcomes (no sexual intercourse or sexual intercourse with type of contraceptive method).

To examine the relationship between the seven sex education types and sexual behavioral outcomes while adjusting for sociodemographic characteristics, a multinomial logistic regression model was estimated with all seven sex education type variables and covariates included. Twelve respondents reported Type 2 (Contraception only) sex education; they were excluded because the small subgroup size prevented the regression from converging. Adjusted Wald tests were

performed to test for statistical significance of the coefficient of each of the other six sex education type variables.

To describe the impact of each education type on sexual behavioral outcomes, the results of the multinomial logit were used to estimate the predicted probabilities of the behavioral outcomes associated with each type of sexual education (except Type 2) and for no sex education. During the calculation of the predicted probabilities for a particular sex education type, the assumption was made that all respondents received that type of education (or no sex education) and each individual's probability of each behavioral outcome was then calculated. Means of the predicted probabilities for each educational type and for no sex education were then calculated and compared. An education type's predicted joint probability distribution represents what the sample would look like if everyone in the sample received that education type, and predicted probabilities add up to 100% for each education type. The *p* values test whether the joint distribution across the five outcomes for a specific sex education type is statistically significantly different from the five-outcome distribution for no sex education (the first row in Table 4). In addition, seven dummy variables were created for each year between 2012-2019 and the multinomial logistic regression model was estimated with and without the dummy variables to examine the effect of time.

To assess whether the relationship between sex education type and the behavioral outcome variable differed by sexual identity (heterosexual vs. sexual minority), interaction terms for sex education type variables, covariates, and dummy year variables were added to the multinomial regression model. Adjusted Wald tests were then performed on the sex education interaction terms as a group to determine whether their coefficients were statistically significant different from zero.

Results

Demographics

Table 1 shows the demographic characteristics of the analytic sample. The mean age of participants was 17.1 years, and 14.9% identified as a sexual minority. The majority of participants were White (72.4%), lived in a suburban-metropolitan area (52.9%) and in households with incomes less than twice the federal poverty level (62.0%). About half of the sample (49.5%) attended religious services at age 14 weekly or more often, and 51.1 % had intact family units.

Associations between demographics and sex education types

Table 2 shows the distribution of sex education types overall and by demographic characteristics. Only 2.4% of respondents reported no sex education. Overall, 71.8% reported instruction in all three categories (Type 7), while 14.5% reported education in refraining from sex and STIs/HIV but not contraception (Type 5). About three-quarters (76.5%) of respondents received at least some instruction in contraception and 21.1% of respondents received sex education with no instruction in contraception. Only 0.3% of respondents reported instruction solely in contraception (Type 2). Race, sexual identity, household poverty, religious attendance, and having an intact family unit were all significantly ($p \leq 0.05$) associated with type of sexual education. Notably, sexual minority females were more than twice as likely to report no sex education compared to their heterosexual peers, and only about half as likely to report receipt of Type 5 (Refraining from sex and STIs/HIV education only) as compared to heterosexual peers. Black females and those who never attended religious services were also less likely to report Type 5 education and more likely to report Type 7 (comprehensive three-category) education

compared to peers of other races and those who attended religious services more often, respectively.

Associations between demographics and sexual intercourse/use of contraceptive method

Table 3 shows the distribution of sexual behavior by demographic characteristics. Overall, 62.1% of respondents reported not having sexual intercourse in the past 12 months. Of the total sample, 7.2% reported having sexual intercourse in the last 12 months and using either no contraceptive method or an ineffective method at last intercourse, 12.0% reported having sexual intercourse in the last twelve months and using a condom-only at last intercourse, 10.1% having sexual intercourse in the last twelve months and using an effective method-only at last intercourse, and 8.6% having sexual intercourse in the last twelve months and using the dual method at last intercourse. Sexual intercourse and use of contraceptive methods were significantly ($p \leq 0.05$) associated with all demographic characteristics. Notably, those of younger age, of 'other' race, whose mothers were ≥ 20 years of age at first birth, had an intact family unit, and did not report high-risk drug use were more likely to report not having sexual intercourse in the past 12 months as compared to peer groups. Additionally, those who were older, Black, whose mothers were ≤ 19 years of age at first birth, were not from an intact family unit and who reported high-risk drug use were more likely to have had sexual intercourse without a method or with an ineffective method of contraception during their last sexual intercourse. Sexual minority females were less likely to report no sexual intercourse and more likely to have used no method or an ineffective method of contraception during their last sexual intercourse.

Multivariate analyses

Table 4 reports predicted probabilities of sexual behavioral outcomes for each type of sex education. Readers may refer to the Methods section for information about predicted probabilities. Five of the six sex education types included in the multinomial logistic regression had a predicted outcome distribution that was significantly ($p \leq 0.05$) different from the distribution associated with no sex education. Type 4 education (Refraining from sex and Contraception only) was the only educational type that was not statistically significant. However, with only 0.8% of respondents (n=39) reporting this type of education, the analysis may have lacked the power needed to accurately determine statistical significance.

As seen in the first row of Table 4, if respondents in this sample reported no sexual education, their probability of reporting no sexual intercourse would be predicted to be 59.5%, their probability of having sexual intercourse with no method/ineffective method was 4.9%, of using a condom alone 5.5%, of using an effective method alone 23.1%, and of using a dual method 7.0%. If respondents had instead reported education in all three categories (Type 7), they would be predicted to have had a probability of 61.1% of reporting no sexual intercourse, a 1.6 percentage point increase compared to those reporting no sex education. Additionally, their probability of reporting sexual intercourse with no method/ineffective method was 6.8%, a 1.9% point increase as compared to those reporting no sexual education. Compared to reporting no sexual education, having had Type 7 education predicted a 7.0 % increase in condom use only, a 2.5% increase in dual methods, and conversely a 13.0% decrease in using no method/ineffective method. When comparing predicted probabilities associated with Type 7 (comprehensive education) and those associated with Type 5 (the most common type of abstinence education), having Type 5 education predicts a 5.3% point decrease in the probability of having had sexual

intercourse, a 2.1% point increase in no method/ineffective method of contraception, and a 5.8% point decrease in the likelihood using a dual method.

Almost all kinds of sex education were associated with a reduced predicted probability of reporting sexual intercourse in the past 12 months compared to no sex education. Respondents receiving Type 1 (Refraining from sex only) education had the highest predicted probability of reporting no sexual intercourse, at 72.5%, an increase of 13% points compared to receiving no sex education. Education about contraception and STIs/HIV only (Type 6) was the only sex education type that was associated with higher reports of sexual intercourse, with a 4.6 percentage point increase compared to no sex education.

Similarly, all but one type of sex education was associated with an increased probability of reporting no method or an ineffective method of contraception at last sexual intercourse. For most types, the probability increased by only a few percentage points, but Type 6 (Contraception and STIs/HIV only) was associated with an increased probability of 10.3 percentage points of reporting no method/ineffective method of contraception. Type 1 (Refraining from sex only), was the only instructional type associated with a decrease in likelihood of reporting no method/ineffective method of contraception; the predicted probability of this outcome was 3.5%, a decrease of 1.4 percentage points compared to receiving no sex education.

All types of sex education were associated with a decrease in the predicted probability of reporting using an effective contraceptive method only. The largest change occurred with Type 3 (STIs/HIV only), with a drop of 19.2 percentage points compared to no sex education. Although all types of sex education were also associated with an increased probability of condom use at last sex in the past 12 months, the results for dual method use at last sex were complex; Type 5 (Refraining from sex and STIs/HIV only) was associated with the largest decrease (3.3

percentage points) in predicted probability for dual method use compared to no sex education, and Type 3 (STIs/HIV only) was associated with the largest increase (7.1 percentage points). Additional information related to the multinomial logit, including relative risk ratios and standard errors, is reported in Table 5. Relative risk ratios are similar but not identical to odds ratios. Compared to a risk ratio, an odds ratio inflates the estimate of the relationship between dependent variable and outcome (Ranganathan et al., 2015).

The addition of interaction terms to assess whether sexual identity modified the relationship between sex education type and sexual behavioral outcome yielded a *p*-value of .065 for the set of sex education interaction variables.

The inclusion of variables accounting for time in the model resulted in slight increases in *p*-values for all sex education types. While most remained $p \leq 0.05$, the *p*-value for Type 7 (all three topic categories) increased to 0.051.

Discussion

While previous studies have characterized sex education as either abstinence-only or comprehensive, this paper is the first to delineate seven different types of sex education and compare the impact of the different education types on the probability of sexual intercourse and contraceptive method use at time of last intercourse among a nationally representative sample of female adolescent youth. This study is also among the first to examine differences in both the receipt of and behavioral outcomes associated with type of sex education on heterosexual and sexual minority females.

In this nationally representative sample, approximately 72% of respondents reported sex education in all three categories (Type 7) and 14.5% received education in refraining from sex and STIs/HIV only (Type 5). The other 5 types of sex education were reported at much lower

levels, with about 4% reporting Type 1 education (Refraining from sex only) and 3.6% reporting Type 6 education (Contraception and HIV/AIDS only). Overall, over the 2011-2019 period, 76.5% received instruction about birth control or condoms, while 21.1% received instruction that excluded those topics.

Nearly all types of sex education were associated with respondents' sexual behavior during the past 12 months. Compared to no sex education, with a few exceptions, exposure to any type of education reduced the likelihood of sexual intercourse, increased the probability of not using a method of contraception by a few percentage points, increased the probability of condom-only use by 6-7 percentage points, decreased the probability of effective method-only use by more than 10 percentage points, and had a variable effect on dual method use.

Each education type was associated with different potential benefits and drawbacks. Comparing the most common types of comprehensive education (Type 7) and abstinence education (Type 5), this analysis found that individuals reporting Type 5 were less likely to report sexual intercourse in the past 12 months, but also more likely to have had sex without a contraceptive method or with an ineffective method and less likely to have used a dual method at last intercourse.

Type 6 education, which lacked instruction in refraining from sex, was associated with the highest probability of having intercourse without a contraceptive method or with an ineffective method, and Type 3 (STIs/HIV only) was associated with the highest probability of dual method use. Type 1 (Refraining from sex only) was notable for having the lowest predicted probability of sexual intercourse, the lowest probability of using no method or an ineffective method of contraception, and the highest probability of condom-only use. Although these findings suggest the importance of distinguishing between subtypes of abstinence-only (Types 1,

3, and 5) and comprehensive (Types 4, 6, and 7) education, the findings related to less common types should be interpreted with caution as the number of respondents reporting these types were relatively small; these findings need to be validated with larger samples.

Multiple findings are consistent with the previous literature, including the association of Type 7 (three-category comprehensive) education with reduced sexual activity and increased condom use compared to no sex education. However, given previous research findings, other findings were less expected, including the association of Type 1, 3, and 5 (subtypes of abstinence-only education) with a lower predicted probability of sexual intercourse compared to both subtypes of comprehensive education (Type 6 and 7) and no sex education. Some study results are consistent with this finding, including Lindberg & Maddow-Zimet's (2012) analysis of 2006-2008 NSFG data, which concluded that both abstinence-only education and abstinence plus birth control education were associated with later initiation of first sex. However, multiple reviews of the evidence, based mostly on studies published prior to 2010, have concluded that abstinence-only programs were ineffective in altering sexual behavior (Denford et al., 2016; Kirby, 2008; Trenholm et al., 2007; Underhill et al., 2007). It is possible that our data analysis differs from these conclusions because abstinence education has improved since the early 2000s in response to increased emphasis on evidence-based interventions. Also, not all study findings have completely precluded the potential for abstinence-only programs to be effective. In a 2012 meta-analysis conducted by the U.S. Centers for Disease Control and Prevention (CDC), the study committee authors concluded that they could not make a final determination about the effectiveness of abstinence education, as abstinence-only programs were found to reduce sexual activity, but the effects were statistically significant only in the nonrandomized control trials and not the more rigorous randomized controlled trials (Chin et al., 2012; Santelli et al., 2017). A

study by Jemmott, Jemmott & Fong (2010) was noted by the CDC (Chin et al., 2012) review for its rigorous experimental design and its finding that an abstinence-only program reduced sexual activity 24 months after the program in a sample of African-American youth.

Another unexpected finding was that most kinds of sex education were associated with a several percentage point increase in reporting using no method or an ineffective method of contraception. Previous reviews and metanalyses have suggested that sex education did not increase rates of sexual risk behavior (Trenholm et al., 2007, Chin et al., 2012; Kirby, 2002, Smoak et al., 2006). It is possible that the randomized controlled trials on which these reviews and meta-analyses were based tended to investigate carefully implemented, higher quality sex education programs, while the NSFG data reflects a broader range of programs as commonly implemented. Thus the NSFG data may reflect the real-world experiences of youth with exposure to lower quality, less effective sex education programs, potentially leading to small increases in reporting using no method or an ineffective method of contraception.

At first glance, the finding that only 2.4% of respondents reported no sex education may be surprising. A search for comparable statistics yielded only a few surveys utilizing a rigorous methodology. An analysis of 2006-2008 NSFG data found that 96% of females (and 97% of males) received formal sex education before the age of 18 (Martinez et al., 2010). The 2013 YRBS, another nationally representative survey, found that 85.3% of youth had ever learned about HIV/AIDS in school (Kann et al., 2014). According to a 2000 Kaiser Family Foundation (KFF) survey, 89% of public school students received sex education between grades 7-12, but the authors note that the education was often quite limited, totaling only a few class sessions (Hoff et al., 2000). These additional statistics generally align with the finding that only 2.4% of female youth report no formal sex education, particularly given that the YRBS statistic reflects

learning about HIV/AIDS only and the KFF survey is more than 20 years old. Additionally, while the YRBS and the KFF surveys asked about sex education received at school, the NSFG survey asks about sex education received at any location, including church, community centers, or other places. Thus the 2.4% finding provides evidence that when all potential sources are taken into account (schools, religious institutions, community centers, and other venues), nearly all youth in the United States receive at least some formal instruction in sex education.

Researchers have posited that sex education may not resonate with sexual minority adolescents the same way it does with heterosexual adolescents (Rasberry et al. 2018). This study found that receipt of education type varied by sexual identity. Compared to heterosexuals, sexual minorities were less likely to report receipt of abstinence-only education (Type 5) and more likely to report no sex education. Previous studies have noted that female and male sexual minority youth were less likely than their heterosexual peers to report having received HIV education (Phillips II et al., 2020; Rasberry et al., 2018). Sexual minority youth have reported feeling excluded or invisible during sex education (Fisher, 2009; Pingel et al., 2013). In 2013, fewer than 5% of sexual and gender minority students in grades 6-12 reported inclusion of positive representation of lesbian, gay, bisexual and transgender people, events, or issues in their health classes (Kosciw et al., 2014). Some abstinence education programs may exacerbate these concerns, as they may be more likely to focus on the importance of heterosexual marriage and to exclude discussions of sexual identity and related health concerns (Fisher, 2009; Santelli et al., 2017). Accordingly, sexual minority students may react to their sex education experiences differently than their heterosexual peers and report that they had not received sex education because they felt it was not relevant to their concerns and health needs (Phillips II et al., 2020).

While this analysis did not find that sex education has a different behavioral effect on heterosexual and sexual minority females (p=0.065), the interaction was close to conventional statistical significance. Results of previous studies are conflicting. Researchers have found that among sexual minority females, HIV education had no effect on condom use (Phillips II et al., 2020) and that exposure to how to say 'no' to sex was associated with negative health outcomes such as an increased likelihood of pregnancy and an increased number of male sexual partners (Bodnar & Tornello, 2019). Raspberry et al. (2018) found that instruction on how to use condoms had a positive effect on condom use among heterosexual males, but not sexual minority males, while Raifman et al. (2018) found that HIV education was associated with more reductions in risk behaviors among sexual minority males than among all adolescent males. Given the lack of agreement, a more detailed examination of this issue is warranted.

Strengths of this study include use of a nationally representative data set, the inclusion of all adolescent females in the analysis (excluding females who are not sexually active may introduce a form of selection bias), delineation of sex education types based on specific instructional content and conducting a sensitivity analysis to test for the effects of time.

This study has several limitations. First, amount of exposure to each topic, specific messages communicated, accuracy of information and quality of teaching were not assessed. Other factors that have been theorized to impact sexual behavior intentions, such as peer norms and personal attitudes about sexual behavior and contraception, also were not measured (Shepherd et al., 2017). Second, the data is based on retrospective self-reports. Third, the decision to group the 7 survey items into 3 categories implicitly assumes that the effects of items in the same category are the same (i.e. the items in Category 1, 'how to say no' and 'wait until marriage,' have the same effects on sexual behavior). However, if each of the 7 survey items had

been treated as a separate sex education topic, over 50 different possible combinations of topics would have been generated, making the analysis of 'total' sex education content impractical. The categories reflect Healthy People 2030's sex education objective (ODPHP, n.d.), and items that were judged to be the most similar in content or purpose were grouped together. Finally, as this study uses observational data, it examines associations but cannot determine causality. However, the analysis was strengthened by controlling for numerous sociodemographic variables that may have confounded the relationship between education type and sexual behavior outcomes.

Future research should assess the amount, types, and accuracy of information obtained online or through social media. In 2018, 95% of youth ages 13-17 reported having a smartphone or having access to one, and 45% reported that they are on the internet "almost constantly" (Pew Research Center, 2018), yet little is known about how often youth turn to online media for sexual health information (Lindberg et al., 2016). In particular, sexual minority youth, lacking information on same-sex relationships from other sources, may rely on the internet as a confidential source of information (Baker et al., 2020; Charest et al., 2016; Guttmacher Institute, 2017; Nelson et al., 2019). Additionally, future studies should measure adolescent perceptions of the amount and tone of instruction related to sexual and gender minority health during in-person or online sex education. Educational methods, such as lectures, role-playing, or hands-on condom application practice, should be assessed in future surveys as well.

Conclusion

This study extends previous research by defining seven different types of sex education in a detailed, systematic manner and comparing the impact of each educational type on five mutually exclusive sexual behavior outcomes. Compared to no sex education, all types except Type 4 (Refraining from sex & contraception only) had a statistically significant effect on sexual

behavioral outcomes (intercourse in the past 12 months and type of contraceptive use). Benefits and drawbacks were noted for each education type. Notably, Type 3 (STIs/HIV only) education was associated with the highest probability of dual method use, and Type 6 (Contraception & STIs/HIV only) education with the highest probability of reporting not using a method or using an ineffective method of contraception. Compared to their heterosexual peers, sexual minority females were more likely to report no sex education and less likely to report receipt of abstinence-only education (Type 5). These results highlight the importance of a detailed assessment of the total content of sex education programs.

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Table 1

Demographic characteristics of females ages 15-19 years, 2011-2019 National Survey of Family Growth

Characteristic	Unweighted *n*	Weighted % (SE)
Age in Years*		
15-16	1476	36.6 (1.1)
17-19	2494	63.4 (1.1)
Race/ethnicity		
Black	924	17.1 (1.1)
White	2606	72.4 (1.4)
Other	440	10.5 (1.0)
Sexual Identity		
Heterosexual	3275	85.1 (0.8)
Sexual minority	654	14.9 (0.8)
Place of residence		
Central city	1474	30.6 (1.6)
Other metropolitan	1898	52.9 (1.9)
Rural	598	16.5 (1.9)
Household poverty		
<200%	2596	62.0 (1.3)
≥200%	1374	38.1 (1.3)
Religious attendance at age 14 years		
Weekly or more often	2014	49.5 (1.2)
Sometimes	1223	31.3 (1.1)
Never	719	19.2 (1.1)
Age of mother at first birth		
≤19 years	1308	30.4 (1.2)
≥20 years	2580	67.5 (1.2)
No mother figure/other	82	2.1 (0.4)
Intact family**		
Yes	1863	51.1 (1.2)
No	2107	49.0 (1.2)
High-risk drug use in past year		
Yes	85	2.0 (0.3)
No	3874	98.0 (0.3)

*Mean age in years = 17.1 (0.03)
**Intact family is defined as having lived with two biological/adoptive parents since birth

Table 2

Type of Sex Education Received: Weighted percentages and demographic characteristics of females ages 15-19 reporting on sex education type, 2011-2019 National Survey of Family Growth

Content category 1= Refraining from sex
Content category 2= Contraception
Content category 3= STI/HIV

Characteristic	**No sex education**	**Type 1**	**Type 2**	**Type 3**	**Type 4**	**Type 5**	**Type 6**	**Type 7**	
		Refraining from sex (1) only	***Contra-ception (2) only***	***STI/HIV (3) only***	***Content Categories 1 & 2***	***Content Categories 1 & 3***	***Content Categories 2 & 3***	***Content Categories 1, 2 & 3***	**p-value**
	n=112	**n =126**	**n =12**	**n =97**	**n =39**	**n =515**	**n =169**	**n =2894**	
		Weighted % (SE)	Weighted % (SE)	Weighted % (SE)	Weighted % (SE)	Weighted % (SE)	Weighted % (SE)	Weighted % (SE)	
Overall	2.4 (0.3)	3.9 (0.6)	0.3 (0.1)	2.7 (0.3)	0.8 (0.2)	14.5 (0.9)	3.6 (0.4)	71.8 (1.2)	
Age in Years									.09
15-16	2.9 (0.7)	3.8 (1.0)	0.2 (0.1)	2.4 (0.5)	0.6 (0.2)	17.8 (1.5)	3.7 (0.6)	68.7 (1.9)	
17-19	2.1 (0.3)	4.0 (0.7)	0.3 (0.1)	2.9 (0.4)	1.0 (0.3)	12.6 (1.1)	3.6 (0.5)	73.5 (1.5)	
Race/ethnicity									<.001
Black	4.0 (1.3)	2.1 (0.5)	0 (0)	2.3 (0.9)	0.8 (0.3)	8.5 (1.0)	5.6 (1.2)	76.7 (2.2)	
White	2.2 (0.3)	4.6 (0.8)	0.2 (0.1)	2.3 (0.4)	0.8 (0.2)	15.7 (1.1)	3.2 (0.5)	70.9 (1.5)	
Other	1.1 (0.4)	2.5 (0.9)	0.8 (0.4)	5.9 (1.8)	1.1 (0.7)	15.9 (3.5)	2.9 (0.8)	69.7 (3.4)	
Sexual Identity									<.001
Heterosexual	1.9 (0.3)	4.1 (0.6)	0.3 (0.1)	2.6 (0.4)	0.7 (0.2)	15.6 (1.0)	3.3 (0.4)	71.6 (1.3)	
Sexual minority	5.0 (1.7)	2.6 (0.7)	0.1 (0.1)	2.9 (1.0)	1.6 (0.6)	8.8 (1.4)	5.1 (1.2)	73.9 (2.6)	
Place of residence									.09
Central city	2.5 (0.4)	4.0 (1.1)	0.4 (0.1)	1.6 (0.3)	0.9 (0.3)	11.0 (1.3)	4.9 (0.8)	74.8 (2.0)	

Other metropolitan	2.2 (0.5)	3.5 (0.7)	0.1 (0.1)	3.2 (0.5)	0.8 (0.2)	15.8 (1.3)	3.2 (0.6)	71.2 (1.7)	
Rural	2.9 (0.7)	5.1 (1.5)	0.5 (0.3)	3.2 (1.1)	1.0 (0.4)	16.7 (2.3)	2.6 (0.8)	67.9 (2.5)	
Household poverty									.02
<200%	2.9 (0.5)	4.3 (0.7)	0.3 (0.1)	3.6 (0.5)	0.8 (0.2)	13.6 (1.1)	3.9 (0.5)	70.7(1.5)	
≥200%	1.7 (0.4)	3.4 (0.9)	0.2 (0.1)	1.2 (0.3)	0.9 (0.3)	16.0 (1.7)	3.1 (0.6)	73.5 (1.8)	
Religious attendance at age 14 years									<.001
Weekly or More often	2.7 (0.6)	5.9 (1.0)	0.1 (0.1)	1.7 (0.4)	0.8 (0.3)	17.3 (1.4)	2.6 (0.4)	68.9 (1.9)	
Sometimes	2.0 (0.4)	1.9 (0.6)	0.3 (0.1)	3.0 (0.8)	0.5 (0.2)	13.4 (1.6)	4.8 (0.9)	74 (1.9)	
Never	2.3 (0.5)	2.3 (1.1)	0.6 (.03)	4.6 (1.0)	1.4 (0.5)	9.0 (1.5)	4.3 (0.9)	75.6 (2.4)	
Age of mother at first birth									.08
≤19 years	2.6 (0.4)	3.5 (0.8)	0.4 (0.2)	2.6 (0.7)	0.9 (0.3)	12.2 (1.4)	4.6 (0.9)	73.2 (1.9)	
≥20 years	2.4 (0.4)	4.2 (0.7)	0.1 (0.1)	2.6 (0.4)	0.8 (0.2)	15.7 (1.2)	3.3 (0.4)	70.9 (1.5)	
Intact family									.03
Yes	2.1 (0.4)	5.2 (0.9)	0.3 (0.1)	3.0 (0.5)	0.9 (0.3)	15.8 (1.3)	3.0 (0.5)	69.8 (1.7)	
No	2.8 (0.5)	2.6 (0.7)	0.2 (0.1)	2.4 (0.4)	0.8 (0.2)	13.2 (1.2)	4.2 (0.6)	73.8 (1.6)	
High-risk drug use in past year									.10
Yes	2.8 (1.6)	0.5 (0.5)	0 (0)	2.7 (1.5)	3.6 (3.0)	10.6 (3.7)	6.9 (3.0)	73.0 (5.5)	
No	2.3 (0.3)	4.0 (0.6)	0.2 (0.1)	2.6 (0.3)	0.8 (0.2)	14.6 (1.0)	3.6 (0.4)	71.9 (1.2)	

Table 3

Associations between demographic characteristics and sexual intercourse and use of contraceptive methods at last intercourse in past 12 months among adolescent females ages 15-19 years, 2011-2019 National Survey of Family Growth

Characteristic	No sexual intercourse in past 12 months	Used no method or ineffective method	Used condom only	Used hormonal or other effective method only	Used dual method	p-value
	n=2461	n=328	n=517	n=374	n=290	
	Weighted % (SE)	**Weighted % (SE)**	**Weighted % (SE)**	**Weighted % (SE)**	**Weighted % (SE)**	
Overall	62.1 (1.3)	7.2 (.6)	12.0 (.8)	10.1 (.8)	8.6 (.8)	
Age in Years						<.0001
15-16	82.1 (1.6)	3.5 (0.8)	6.0 (0.9)	4.7 (1.0)	3.7 (0.9)	
17-19	50.5 (1.7)	9.3 (0.8)	15.5 (1.1)	13.3 (1.1)	11.4 (1.0)	
Race/ethnicity						<.0001
Black	56.9 (2.4)	10.5 (1.6)	15.2 (1.6)	10.8 (1.8)	6.6 (1.2)	
White	60.8 (1.5)	6.8 (0.7)	11.7 (0.9)	10.9 (1.0)	9.8 (0.9)	
Other	79.3 (2.7)	4.5 (0.9)	9.2 (1.6)	3.8 (1.2)	3.2 (0.9)	
Sexual Identity						.007
Heterosexual	62.7 (1.5)	6.7 (0.6)	11.9 (0.9)	9.5 (0.8)	9.2 (0.9)	
Sexual minority	57.9 (3.0)	10.1 (2.0)	12.7 (1.5)	14.2 (2.5)	5.0 (1.0)	
Place of residence						.003
Central city	59.5 (1.7)	8.2 (1.1)	15.1 (1.3)	9.6 (1.6)	7.6 (1.2)	
Other metropolitan	66.0 (1.6)	7.1 (0.8)	10.1 (1.0)	9.1 (0.9)	7.6 (0.9)	
Rural	54.3 (4.7)	5.6 (1.2)	12.5 (2.4)	14.4 (2.5)	13.3 (2.8)	
Household poverty						.002
<200%	62.6 (1.6)	8.0 (0.7)	12.2 (0.9)	10.8 (1.0)	6.5 (0.8)	
≥200%	61.3 (2.2)	5.9 (0.9)	11.8 (1.3)	9.1 (1.2)	12.0 (1.5)	
Religious attendance at age 14 years						.025
Weekly or more often	65.4 (1.6)	7.5 (0.9)	11.3 (1.0)	9.0 (1.1)	6.9 (0.8)	
Sometimes	62.3 (2.1)	6.2 (0.9)	11.9 (1.3)	9.5 (1.2)	10.2 (1.5)	
Never	53.9 (2.9)	8.1 (1.4)	14.3 (2.1)	13.3 (1.8)	10.4 (2.3)	
Age of mother at first birth						<.0001
≤19 years	54.2 (2.2)	12.5 (1.4)	12.8 (1.2)	12.8 (1.8)	7.8 (1.3)	
≥20 years	66.1 (1.4)	4.8 (0.5)	11.7 (1.0)	8.7 (0.8)	8.8 (0.9)	

No mother figure/ other	47.0 (8.4)	9.1 (3.1)	12.9 (4.8)	18.6 (8.3)	12.5 (8.4)	
Intact family						<.0001
Yes	70.1 (1.7)	5.1 (0.7)	10.0 (1.1)	7.9 (1.0)	7.0 (0.9)	
No	53.8 (1.8)	9.4 (0.9)	14.1 (1.1)	12.5 (1.1)	10.2 (1.2)	
High-risk drug use in past year						<.0001
Yes	13.0 (4.0)	22.6 (4.9)	14.6 (4.0)	35.3 (7.0)	14.4 (4.7)	
No	63.1 (1.3)	6.9 (0.6)	11.9 (0.8)	9.6 (0.8)	8.5 (0.8)	

Table 4

Predicted probabilities of sexual intercourse and contraceptive behavior at last intercourse in the past 12 months by receipt of sex education type among females ages 15-19 years, 2011-2019 National Survey of Family Growth

	Predicted probabilities (%) of outcomes at last intercourse in past 12 months					
	No sexual intercourse	Had sexual intercourse and used the contraceptive method listed below				
Type of sex education*		No method or ineffective method	Condom only	Hormonal or other effective method only	Dual method	p-value
No Sex education	59.5	4.9	5.5	23.1	7.0	
(1) Refraining from sex only	72.5	3.5	12.6	5.3	6.1	.042
(3) STIs/HIV only	67.3	7.6	7.1	3.9	14.1	.035
(4) Refraining from sex & contraception only	60.8	5.3	10.4	10.9	12.6	.381
(5) Refraining from sex & STIs/HIV only	66.4	8.9	12.2	8.7	3.7	.031
(6) Contraception & STIs/HIV only	54.9	15.2	12.1	11.2	6.5	.016
(7) Refraining from sex, contraception & STIs/HIV	61.1	6.8	12.5	10.1	9.5	.036

*Predicted probabilities could not be calculated for Type 2 (Contraception only) due to small sample size (n=12).

Table 5

Results of multinomial logistic regression of associations between sex education types and behavioral outcomes among females ages 15-19, 2011-2019 National Survey of Family Growth [a]

	Sex Education Type 1 (Refraining from Sex only)		*p*-value = 0.042
Behavioral Outcomes	*RRR*[b]	*S.E.*	*95% CI*
Had intercourse and used no method or ineffective method	Ref	Ref	Ref
No sexual intercourse	2.19	1.43	0.61-7.90
Had intercourse and used a condom only	3.47	2.88	0.68-17.79
Had intercourse and used a hormonal or other effective method only	0.31	0.24	0.07-1.43
Had intercourse and used dual method	1.25	1.08	0.23-6.85
	Sex Education Type 3 (STIs/HIV only)		*p*-value = 0.035
Behavioral Outcomes	*RRR*	*S.E.*	*95% CI*
Had intercourse and used no method or ineffective method	Ref	Ref	Ref
No sexual intercourse	0.86	0.50	0.27-2.71
Had intercourse and used a condom only	0.87	0.63	0.21-3.59
Had intercourse and used a hormonal or other effective method only	0.11	0.08	0.02-0.46
Had intercourse and used dual method	1.36	1.18	0.25- 7.50
	Sex Education Type 4 (Refraining from sex & contraception only)		*p*-value = 0.381
Behavioral Outcomes	*RRR*	*S.E.*	*95% CI*
Had intercourse and used no method or ineffective method	Ref	Ref	Ref
No sexual intercourse	1.01	0.83	0.20-5.10
Had intercourse and used a condom only	1.78	1.69	0.27-11.63
Had intercourse and used a hormonal or other effective method only	0.43	0.36	0.08-2.20
Had intercourse and used dual method	1.72	1.79	0.22-13.37
	Sex Education Type 5 (Refraining from sex & STIs/HIV only)		*p*-value = 0.031
Behavioral Outcomes	*RRR*	*S.E.*	*95% CI*
Had intercourse and used no method or ineffective method	Ref	Ref	Ref
No sexual intercourse	0.69	0.39	0.22- 2.11
Had intercourse and used a condom only	1.24	0.72	0.39- 3.87
Had intercourse and used a hormonal or other effective method only	0.20	0.14	0.05- 0.77
Had intercourse and used dual method	0.28	0.23	0.06- 1.42
	Sex Education Type 6 (Contraception & STIs/HIV only)		*p*-value = 0.016
Behavioral Outcomes	*RRR*	*S.E.*	*95% CI*
Had intercourse and used no method or ineffective method	Ref	Ref	Ref
No sexual intercourse	0.28	0.17	0.09-0.91
Had intercourse and used a condom only	0.68	0.48	0.17-2.77
Had intercourse and used a hormonal or other effective method only	0.15	0.11	0.04-0.62
Had intercourse and used dual method	0.28	0.27	0.04-1.87

Sex Education Type 7 (Refraining from sex, contraception, & STIs/HIV)			*p*-value = 0.036
Behavioral Outcomes	*RRR*	*S.E.*	*95% CI*
Had intercourse and used no method or ineffective method	Ref	Ref	Ref
No sexual intercourse	0.80	0.40	0.30-2.14
Had intercourse and used a condom only	1.68	0.95	0.55-5.15
Had intercourse and used a hormonal or other effective method only	0.31	0.19	0.09-1.05
Had intercourse and used dual method	1.00	0.75	0.23-4.35

[a] The model controlled for age, race, sexual identity, place of residence, household poverty, religious attendance at age 14,
age of mother at first birth, intact family, and high-risk drug use.
[b] RRR= relative risk ratio.

References

Refer to Cumulative Reference List

Chapter 4:

Measuring sexual minority-inclusivity in sex education: Revising and assessing the psychometric properties of a scale

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This manuscript is intended to meet the data-based paper requirement of the manuscript option dissertation. The primary author of this manuscript is Elizabeth Anne McKay; contributions include study conceptualization, data collection, data analysis and interpretation, initial manuscript drafting, and manuscript revision and editing. Matias Placencio-Castro is the second author; contributions include study conceptualization, data analysis, manuscript revision and editing, and final approval of manuscript. Allyssa Harris is the third author; contributions include manuscript revision and editing and final approval of manuscript. Susan Kelly-Weeder is the fourth author; contributions include manuscript revision and editing and final approval of manuscript. Holly B. Fontenot is the final author; contributions include study conceptualization, data collection, manuscript revision and editing, and final approval of manuscript. The target journal is Sex Education, which had a 2020 impact factor of 2.646. This international, peer-reviewed journal acknowledges that sex education occurs in many settings, such as home, school, in the community or via the media. Sex Education publishes papers on "all aspects" of sex education and targets a wide audience from multiple disciplines, including public health,

education, sociology and psychology. This manuscript represents a significant contribution to the dissertation work.

Introduction

Almost 16% of high school students in the United States currently identify as a sexual minority (SM; lesbian, gay, bisexual, or questioning; Underwood et al., 2020). Sexual minority youth (SMY) experience many sexual health inequities compared to heterosexual youth. For example, they are more than twice as likely to have sex before age thirteen (Kann et al., 2016) and to experience dating violence (Dank et al., 2014). Female SMY are more likely to ever have been pregnant (Centers for Disease Control and Prevention, 2019b), and male SMY have a disproportionally high risk of becoming infected with HIV compared to their heterosexual peers (Centers for Disease Control and Prevention, 2021).

Providing education about a range of sexual health topics is an important way to address these health concerns and support healthy sexual development in all youth (Centers for Disease Control and Prevention, 2020b; Kirby, 2008). However, SMY report feeling excluded, silenced, or pathologized during sex education classes (Formby, 2001; Gowen & Winges-Yanez, 2014; Hobaica & Kwon, 2017), describing sex education as often focused on heterosexual sex and primarily conveying messages about abstaining from penile-vaginal sex and preventing pregnancy and STIs (Bible et al., 2020; Gowen & Winges-Yanez, 2014; Jarpe-Ratner, 2020; Pingel et al., 2013). Sexual orientation may not be discussed at all or discussed mainly in the context of HIV or sexually transmitted infection (STI) risk (Gowen & Winges-Yanez, 2014). For reasons such as these, SMY are less likely than heterosexual peers to report schools as a main source of sexual health information (Charest et al., 2016; Wilson et al., 2018).

Brief Review of Related Literature

A growing number of states have mandated that sex education be inclusive of the needs of sexual minorities (Nash et al., 2019). As of November 2021, ten states and the District of Columbia require that sex education include positive content regarding sexual orientation, but give little guidance about how to do so (Guttmacher Institute, 2021). While there is no established definition of SM-inclusivity, relevant literature suggests that a SM-inclusive sex education has high levels of: (1) information relevant to sexual minorities, (Blake et al., 2001; Jarpe-Ratner, 2020; Kosciw et al., 2018; Sanchez, 2012; Snapp et al., 2015; Sondag et al., 2020) (2) support for (Jarpe-Ratner, 2020; Kosciw et al., 2018; Snapp et al., 2015) and (3) visibility of sexual minorities (Keiser et al., 2019).

Knowledge about how best to make sex education more SM-inclusive and the impact of doing so is limited by the lack of an established way to define and measure the concept of SM-inclusivity. Most researchers have used qualitative methods to describe SMY sex education experiences; only four known studies have attempted to measure SM-inclusivity (Blake et al., 2001; Keiser et al., 2019; Proulx et al., 2019; Snapp et al., 2015). Three of the four studies assessed SM-inclusivity with only 1-2 survey questions (Blake et al., 2001; Snapp et al., 2015; Proulx et al., 2019), and only two studies (Keiser et al., 2019; Snapp et al., 2015) were based on youth perceptions (which, compared to adult perceptions, may be more accurate predictors of youth sexual behavior; Jaccard et al., 1998).

Keiser et al. (2019) proposed the most in-depth assessment, a ten-item scale named the Perceived Inclusivity of Sex Education Scale (PISES). The PISES scale contains items asking respondents about relevance of content and language used in sex education, level of support and affirmation expressed toward sexual minority identities during sex education, plus how prepared,

visible, or comfortable their sex education experiences made them feel. This work was an important initial step toward development of a SM-inclusivity scale and several items in the scale reflect important aspects of SM-inclusivity, such as relevant content and visibility and support for SM identities. However, the scale lacks an explicit definition of SM-inclusivity, content validity and item clarity were not assessed, and many items are vaguely worded and highly subjective. Additionally, the authors did not investigate reliability beyond Cronbach's alpha. Use of Item Response Theory (IRT), a modern measurement methodology that involves an examination of the performance of each item in a scale rather than focusing only on the scale as a whole, would determine which items contribute the most effectively to the measurement of the construct of interest and improve the scale's ability to discriminate between low, medium, and high levels of SM-inclusivity (Raju et al., 2014; Nguyen et al., 2015).

The purpose of this study was to revise the PISES scale and rigorously evaluate the content validity and psychometric properties of the revised version. The revised scale was designed to identify concrete, observable characteristics of sexual-minority inclusivity in the sex education classroom in order to inform teacher and curriculum development and evaluation. This proposed study is a crucial step toward the rigorous measurement and evaluation of sexual minority-inclusivity in sex education.

Specific Aims

(1) Aim 1: Revise the PISES scale and assess the content validity of the revised scale. The scale measures SM young adult perceptions of sexual minority-inclusivity in school-based sex education received before the age of 18 years.

(2) Aim 2: Conduct a pilot study to assess scale reliability and perform a Rasch analysis of the revised scale.

Rasch Analysis

Simply stated, item response theory (IRT) describes the probability of an individual responding a certain way to a given item (Wilson, 2005). In a traditional classical test theory framework, items in a scale are typically very similar to each other and researchers assess how well the items work together as a group (DeVellis, 2017; Gordon, 2015). In contrast, researchers using the IRT framework focus more on the characteristics of individual items and conceptualize the trait or construct of interest as a continuum. Researchers create items that are aimed at or "tuned" to different levels of trait or ability (DeVellis, 2017) and attempt to place items at regular intervals along the construct's continuum (similar to a ladder, with items tuned to a lower level of trait/ability positioned on the lower rungs and the items aimed at higher trait/ability levels positioned at higher rungs). Considering the construct of SM-inclusivity, an item regarding previous instruction about the terms "gay" or "bisexual" might be easier for a respondent to agree with, or endorse, than an item regarding previous instruction in the development of sexual identity. Thus the first item would have a lower 'item difficulty' level than the second. A respondent with higher levels of the trait or construct has more 'person ability' than someone with lower levels of the construct of interest. Rasch analysis is a type of IRT analysis that estimates the difficulty of items and the ability/trait level of the respondents and then uses these estimates to model the probability of a person responding a certain way to an item (Wilson, 2005).

When the group of items is administered to a sample of the target population, a Rasch analysis yields empirical estimates of item difficulty and person ability on the same scale. A variable map (also called an item-person map) offers a way to visualize whether the items cluster at a narrow range of ability level, or are more spread out and able to describe a broad range of

ability level. The map also provides a visual way to compare item difficulty (also known as item location) with person ability (also known as person location). When a person's ability level is close to an item's difficulty, they are located near each other on the map. The more items located near a person's ability level, the more information is obtained regarding the person's location on the continuum. When a person and item location are spaced far apart, as when an item is very easy or very hard for a person with a certain ability level, less information is gained.

Rasch analysis can inform the development and refinement of conceptual frameworks. The process of generating items that stretch across the construct continuum encourages researchers to clearly define the construct and carefully consider which items best operationalize the construct (Gordon, 2015). When researchers have a theoretical framework that hypothesizes an order of item difficulty *a priori*, IRT analysis can be used to assess consistency between the observed data and the conceptual framework (Gordon, 2015; Ludlow et al., 2008). Alternately, in this study, existing literature provided little knowledge about the relative positioning of items from easy to hard and thus the observed data may inform development of the conceptual framework by providing an operational definition of the construct of interest (Gordon, 2015; Wright & Stone, 1999).

Construct Definition and Theoretical framework

The authors of this study propose that SM-inclusivity has three major elements: (1) support for sexual minorities, (2) visibility of sexual minorities, and (3) information that is relevant for sexual minorities. Support for SM individuals is defined as affirmation of SM identities and includes use of up-to-date and respectful language (such as 'partner' or explicit reference to two boyfriends/girlfriends. Visibility was defined as the extent to which SM identities and relationships were portrayed or represented in the classroom and curriculum.

Information or content relevance was defined as how much information sexual minority youth received about topics that are important to their sexual health, including safer sex practices for people in SM-relationships and sexual identity development. It is important to note that this scale focuses solely on the construct of SM-inclusivity, which is related to, but separate from, the construct of gender minority-inclusion. The experiences of gender minorities are likely to be different than those of sexual minorities and should be investigated separately.

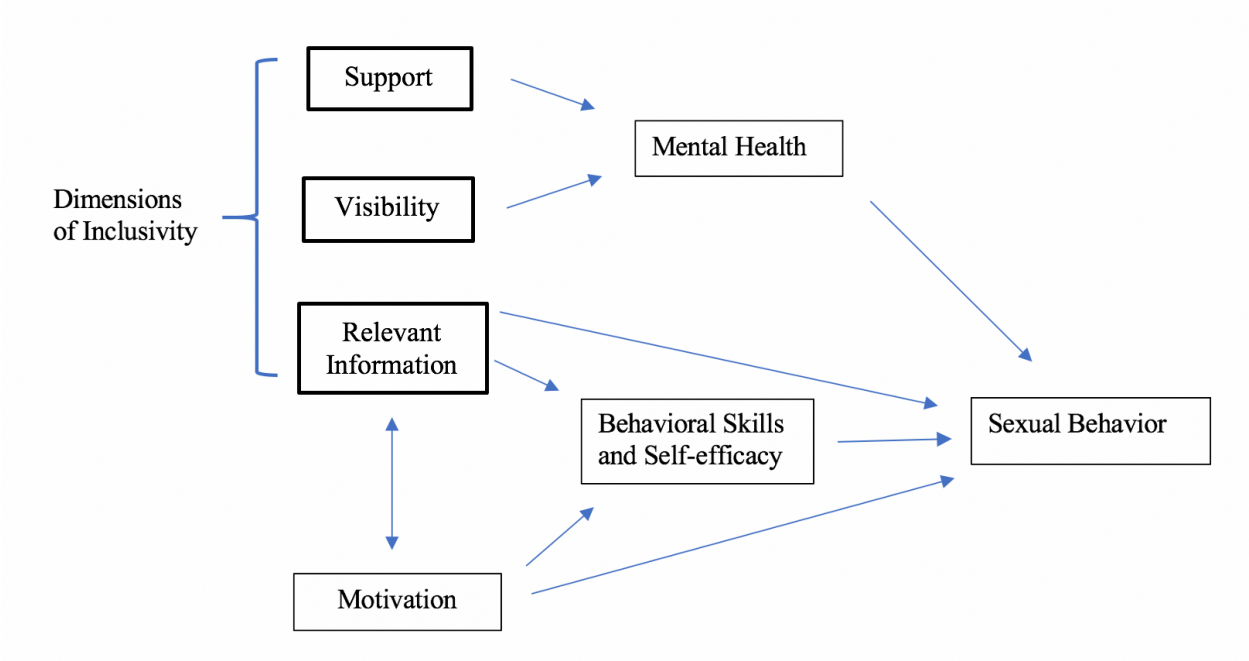

Figure 1. Theoretical framework

Figure 1 shows the relationships between these three dimensions of inclusivity and constructs from two theories, Minority Stress Theory (Meyer, 2003) and Information-Motivation-Behavioral Skills Theory (Fisher & Fisher, 1992). Minority Stress Theory suggests that experiences with prejudice events (discrimination or violence) and social support influence mental health outcomes in sexual minority individuals. Fisher et al.'s (2002) Information-Motivation-Behavioral Skills (IMB) model, originally developed in 1992 to create a framework for HIV/AIDS intervention programs, suggests that there are three key determinants of a health

promotion behavior (such as HIV preventive behavior): (1) information relevant to the behavior (2) motivation to perform the behavior, and (3) behavioral skills related to the behavior.

The first two dimensions, support and visibility for sexual minorities experienced during sex education, describe aspects of experiences with prejudice events (such as discrimination) and social support in Minority Stress Theory (MST). It follows that levels of support and visibility influence the mental health of sexual minority individuals. While MST relates only to mental health outcomes, the framework developed for this dissertation proposal extends MST by positing that mental health influences sexual behavior, a proposition which is empirically supported (Agnew-Brune et al., 2019; Rosario et al., 2006). Furthermore, a recent meta-analysis concluded that "experienced homophobia" (p. 1) (negative attitudes and treatment encountered by men who have sex with men) is associated with HIV infection risk behaviors among men who have sex with men (Jeffries et al., 2021).

As suggested earlier, the third dimension of inclusivity, relevant information, is a component of IMB theory. Although the theoretical framework includes the entire IMB model, this study focused on the 'information' component of the IMB model. According to the proposed theoretical framework, an increase in information relevant to sexual minorities may lead to an increase in motivation and an increase in behavioral skills. Relevant information, motivation, and behavioral skills have both indirect and direct relationships with sexual behavior, as seen in Figure 1. In situations in which an individual makes decisions unilaterally (such as HIV testing or pre-exposure prophylaxis, or PrEP, use), there may be a direct relationship between information and behavior, as well as motivation and behavior. However, many situations involve sexual partners and thus are more behaviorally complex, involving refusal and negotiation skills. Fisher et al. (2014) posit that in these situations, information and motivation work through, or are

mediated by, behavioral skills to influence sexual behavior. Fisher (2011) empirically tested how well the IMB model predicted the sexual risk behaviors of young sexual minority males and concluded that higher levels of HIV-prevention information and motivation were associated with both greater perceived HIV-prevention behavioral skills and decreased levels of HIV-risk sexual behavior.

Methods

Research Design

This study utilized a mixed methods approach. The first phase of the study, scale revision, involved developing a pool of revised and new survey items, obtaining feedback on the construct definition and the pool of potential survey items from experts in the fields of sex education and sexual minority health, and conducting think-aloud interviews with twelve sexual minority young adults (SMYA). Items were revised, added, or deleted according to the feedback received. During the second phase, the revised set of 22 proposed items was administered via a pilot survey to 186 SMYA and a Rasch analysis was conducted, culminating in the selection of 10 items to create a shortened, refined scale.

Phase One Scale Revision

Developing the preliminary survey item pool. Scale revision involved an iterative process of item development, feedback, and revision. Initially, each of the ten original PISES scale items were reviewed and deleted if judged not relevant to one of the elements of SM-inclusivity as defined for this study. The revised PISES scale focused on observable characteristics such as teacher behavior and curriculum content rather than how sex education made SMY feel. Four items of the original PISES scale were judged to fall outside the construct of LGBQ-inclusivity as defined and were removed. Each of the remaining six PISES items were

rewritten to increase clarity and specificity and new potential items were written to more fully describe the construct. Each item aligned with one of the three proposed elements of SM-inclusivity. Item development was informed by the National Standards of Sex Education (Future of Sex Education Initiative, 2020) and the CDC's School Health Profiles standards for sexual health education (Centers for Disease Control and Prevention, 2019c) as well as relevant qualitative literature.

First round expert feedback on construct definition and preliminary item pool. Once the pool of revised and new items was created by the study team, nine experts gave detailed feedback on the construct definition and content validity of the items (item relevance to the construct definition) via interviews and a Qualtrics survey. The group of experts included people who had developed and/or taught sex education curriculum specifically for SM youth and scholars in the fields of public health and nursing who specialize in SM health. The experts were asked to rate on a scale of 1-4 (1= Not essential, 2= Somewhat essential, 3=Quite essential, 4=Highly essential) how essential each of the three proposed elements (support, visibility, and relevant content) was to the construct of SM-inclusivity and whether they thought something should be changed or was missing from the construct definition. To evaluate content validity, the experts were asked to rate the relevance of the proposed survey items to the construct definition on a scale of 1- 4 (1= Not relevant, 2= Somewhat relevant, 3=Quite relevant, 4=Highly relevant); the experts gave detailed verbal or written feedback about the relevance and suitability of items and shared ideas for revision or addition of items as well. Additionally, experts were asked to suggest a term to refer to sexual minorities (e.g. 'sexual minority,' 'LGB,' 'LGBQ+' or 'sexually diverse').

Average relevance ratings for each proposed item were calculated; items with average relevance ratings less than 3.0 were considered for deletion. One item received a mean relevance rating of less than 3.0 and was rewritten to address the experts' concerns. Items were revised or added according to the expert feedback.

Sample recruitment. SMYA participants were recruited via SM student networks affiliated with colleges and universities in the northeastern United States. Respondents were recruited from a range of community colleges and public and private universities to increase student diversity. Eligibility criteria for the survey included: (1) young adult between the ages of 18-23 years, (2) sexual minority (e.g. gay, lesbian, bisexual, queer, pansexual, asexual), and (3) received sex education in the United States.

Recruitment advertisements were posted on network social media pages and recruitment emails were sent to associated listservs. For phase one recruitment, interested SMYA were asked to contact the lead author by email to obtain more information, confirm their eligibility, and, if desired, set up a virtual interview via Zoom or phone. Interview participants were offered a $20 gift card from Target or Amazon for their time.

Revision of preliminary item pool based on SMYA feedback and second round expert feedback. Via virtual interviews, 12 SMYA were then asked to read aloud each of the survey items and describe their interpretation and the clarity and relevance of each item. SMYA were also asked to indicate which items, if any, should be added, removed, or reworded. This feedback was used to further modify and delete items.

Finally, five of the experts again rated the relevance of items that had been added or modified after the first round of feedback. Ratings of 3.0 and above indicated items were 'quite' to 'highly' relevant to the concept of SM-inclusivity. Of the two items receiving average expert

relevance ratings below 3.0, one item (Informed about important LGBQ+ people and their accomplishments) was judged not essential to the construct and deleted. The other item (Teacher welcomes well-intentioned questions) received an average score of 2.8. Experts cited concerns that students might vary widely in their interpretation of a "well-intentioned question." The item, based on prior qualitative research (Hobaica & Kwon, 2017) and feedback from SMYA, was intended to represent a low to mid-level of SM-inclusivity and to capture situations in which SM identities and relationships are not included in the planned curriculum, but teachers are open to student-initiated comments and questions (e.g. they "don't shut down the conversation" as described by one SM young adult). Given that this item described an aspect of SM-inclusivity whose importance was corroborated by prior research and current SMYA feedback, it was retained.

Phase Two: Pilot Survey

Sample recruitment and procedures. Phase Two eligibility criteria and methods of recruitment were the same as Phase One. Recruitment ads and emails regarding pilot survey recruitment provided potential participants with a link to the Qualtrics survey, which included study information, an eligibility screener, and informed consent. Those determined to meet eligibility requirements consented to the survey before completing the survey using the Qualtrics platform. IP addresses were blocked via Qualtrics to ensure the data was non-identifiable, and data was assessed for legitimacy and completion as it arrived. At the end of the survey participants were offered a $5 Dunkin' Donuts or Starbucks gift card. If a participant chose to accept the gift card they were linked to a separate Qualtrics survey to provide first name and email address so they could be sent their gift card electronically. This remuneration method kept

survey data non-identifiable. All procedures were approved by the Boston College Institutional Review Board.

Pilot measure. The phase one scale revision process described in previous sections culminated in the creation of a set of 22 revised items, which will be referred to as the 'pilot measure.' Drawing directly from the proposed definition of SM-inclusivity, the pilot measure had 22 items related to three elements: (1) relevance of information to SM individuals and (2) support for and (3) visibility of SM individuals. The section of the scale (11 items) related to relevance of information is headed by the question, "How much information did you receive in sex education classes at school about the following topics?" followed by a list of topics. For the section of the scale that included both Support/Visibility (11 items), the question heading the section reads, "During your sex education classes, how much did the following happen?" Response options are based on a 4-point Likert scale (0= Not at all, 1= A little bit, 2= A moderate amount 3= A lot). Responses are summed to compute the total score. Higher scores indicate higher levels of SM-inclusivity (see Table 3 for scale items).

While twenty of the items used positive language (e.g. "Diverse sexual identities were included in sex education lessons"), two negative items were initially included in the item pool and were reverse scored ("My sex education teacher(s) communicated the message that being LGBQ+ is morally wrong" and "My sex education teacher gave me the impression that being LGBQ+ is dangerous and likely to pose a risk to one's health (such as getting HIV/AIDS").

Data analysis. The Qualtrics survey data was downloaded into STATA (Statacorp, College Station, TX) for initial data management and analysis and Winsteps 5.2.1 for Rasch analysis.

Descriptive data was analyzed using means and standard deviations for continuous variables and percentages for nominal data. Scale data analysis involved a classical test theory component and a Rasch analysis component. In line with classical test theory, dimensionality was assessed using Exploratory Factor Analysis. Items with factor loadings of less than .20 were considered for deletion. Then, item-total correlations (point-biserial) were examined as to check instrument internal consistency and the Cronbach Alpha was used as a measure of reliability. Items with extremely low (<0.1) or negative item-total correlations were flagged and removed from further analysis.

Lastly, Item Response Theory analyses were conducted using the partial credit model, a version of the Rasch model suitable for polytomous items, or items with three or more response options, that allows category threshold parameters to vary across items. Item- and person-level analysis included the evaluation of fit statistics (the so-called Infit and Outfit), response category characteristic curves, and item and person separation statistics. Item redundancy was assessed with the aid of a variable map. This data analysis was applied to further modify, add, or delete items as needed.

Results

Phase One: Expert Feedback Regarding Construct Definition and Item Relevance

Experts strongly endorsed the definition of SM-inclusivity, with average relevance ratings of 4.0 for support and 3.9 for relevant information and visibility on a scale of 1-4 (1=not essential, 4=highly essential). Average relevance ratings for each item ranged from 2.8 to 4.0. See Table 2 for more details.

Phase Two: Pilot Survey

Demographics of survey sample. Of 315 potential participants who attempted to complete the survey, 89 did not meet eligibility requirements, and an additional 40 provided consent but did not complete the survey. Listwise deletion was employed, yielding a final sample size of 186 SMYA (see Table 1). Of the 186 participants, the mean age was 19.7 years, and 41% identified as bisexual, 35% gay or lesbian, 16% queer, 4% asexual, and 4% pansexual. The majority of participants were female (55%), and 22% were male, 17% nonbinary, 2% transgender, and 4% another identity, such as genderqueer or genderfluid. Almost 14% of participants were Latinx/Hispanic, and the majority were white (76%), 11% Asian, 4% Black, 1% Native Hawaiian/Pacific Islander, and 8% more than one race. The participants received sex education primarily in public (83%) and suburban schools (68%) in the northeastern region (71%) of the United States. Estimated total hours of sex education was variable, with 29% reporting 6 hours or less, 37% reporting 7-14 hours, and 34% reporting 15 or more hours.

Assessing Dimensionality of the 22-Item Pilot Measure. The overall Kaiser-Meyer-Olkin KMO value, a measure of sampling adequacy, was .93, suggesting that the data was appropriate for factoring. Exploratory Factor Analysis of the 22 items provided strong evidence of a single factor that accounted for 77% of the variance, with Factor 1's eigenvalue (9.71) substantially larger than that of Factor 2 and 3 (1.24 and 0.77, respectively). Factor loadings of the twenty positive items ranged from .4760- .7982. Factor loadings of the two negative items were much lower, .2041 and .2288. The two negative items were deleted, as they differed from the positive items in how they operationalized 'support' (as a lack of stigmatization rather than providing affirmation) and had notably lower factor loadings.

Evaluation of Reduced 20-Item Set. The Cronbach alpha for the 20 items was .944, which was high enough to support a reduction in scale length. Corrected item-total correlations ranged from .4562- .7855. Given a 0.3 minimum value for retention, no items were deleted (Petrillo et al., 2015).

Person and item separation statistics are used in Rasch analysis to examine measurement precision (Wright & Stone, 1999). Person separation indicates how well the items distinguish between high and low ability people, and item separation indicates how well the people in the sample distinguish between the items; higher values indicate more precision (Wright & Stone, 1999). The 20-item preliminary revised scale had a person separation index of 2.73 with a separation reliability of .88. Using the criteria of > 2 for person separation and >0.8 for reliability, these values are acceptable (Linacre, *n.d.*b). Item separation index was 5.31 with a separation reliability of .97, which confirmed the item continuum had an adequate range of difficulty and sample size was adequate to confirm the item hierarchy, or the order of items when listed by increasing difficulty. Acceptable criteria for item separation is > 3 for item separation and > 0.9 for reliability (Linacre, *n.d.*b).

A Rasch analysis also involves examination of the variable map. People are represented on the left side of the map; the "#" symbol often represent 2 or more people and the "." symbol often represents 1-2 people. Respondents reporting lower levels of SM-inclusivity in sex education are located at the bottom and those with relatively high levels of SM-inclusivity in sex education are located at the top. Items are listed on the right side of the map, with the easiest items at the bottom and the hardest items at the top. Items and people are measured with the same scale using logit units. When items are well targeted to the sample, the people on the left side are located near or alongside the items on the right side.

The variable map of the 20-item set (see Figure 1a) showed that the items were moderately well-spaced over a range of -1.57 to 1.18 logits (see Table 2 for item logit values). Many people were located well below the items; the person mean was -2.17 logits, more than 2 logits below the item mean (which has a value of 0). A difference of 2.17 logits between person and item means is excessive, as it typically should be no greater than 1.0 logits (Gothwal et al., 2009). In other words, the distribution of items was not well matched to the distribution of people; the items were relatively "hard" for this sample. Additionally, eleven items fell within the 0 – 0.60 logit range, suggesting some redundancy in item difficulty and the possibility of deleting some items. This redundancy suggested an opportunity to shorten and refine the preliminary set of 20 items.

Using Rasch analysis to Shorten and Refine the Reduced 20-Item Set

Response Category Functioning. For each item, high ability respondents are expected to choose higher scoring responses (e.g. a "2" or "3") while low ability respondents would choose lower scoring responses (e.g. a "0" or "1"). When response options are too numerous or have confusing labels, individuals may have difficulty responding to items in a consistent and logical way (Pallant et al., 2006). Through Rasch analysis we can examine whether respondents are using the response categories in the expected order: as person ability increases, the most probable response to each item also advances in order from 0 to 3 (Andrich, 1996; Linacre, *n.d.*a). An examination of the category characteristic curves showed that the category thresholds were ordered as expected and no changes (e.g. combining the "2" and "3" response categories) were deemed necessary.

Assessment of item misfit. Eighteen of the twenty items demonstrated acceptable item fit. Item fit is examined to assess the extent to which people responded to items in ways that

were expected. For example, a person with a low ability level should not endorse hard items and a person of high ability level should endorse easy items. Infit and outfit values assess item fit. These values are both based on squared residuals (the difference between expected and observed responses), but infit is more sensitive to unexpected responses made by a person on items close to their ability level and outfit is more sensitive to unexpected responses on items that are located far from a person (as when a high ability person misses an easy item; Linacre, 2020). Infit and outfit mean square unstandardized (MNSQ) values between 0.5 – 1.5 and standardized (ZSTD) mean square values less than 2.0 are considered acceptable (de Ayala, 2009; Linacre, 2002).

Two items were deleted due to significant item misfit. Items T11 (Influences on attitudes regarding sexual identity) and T7 (Different ways to form families) had excessive values for both of the infit values and unstandardized outfit values. See Table 2 for details. These values indicated that individuals responded to these items in less predictable ways, making the items less productive for measurement (Linacre, 2002). These items were judged to have relatively complex wording and to be less essential to the construct than other items and were deleted.

In contrast, two items (S1 and S7) had standardized infit and outfit values less than -2, which indicates that the data is "too predictable" (Linacre, 2020). These two items had the highest corrected item-total correlations of the set (.75 and .79, respectively), which helps to explain their overpredictability: individuals responding affirmatively to these items were very likely to have endorsed many other items as well. Compared to increased levels of unpredictability, increased levels of predictability are less troublesome and the items were retained.

Two other items were noted for having infit or outfit values outside the acceptable range. Item S3, with a standardized outfit value of 2.02, was retained because the value was so close to

the ‘acceptable’ level of 2.0. Item S8 (School/classroom actions to support LGBQ+ students) had a high standardized infit value. The source of excessive infit values can be difficult to identify (Linacre, 2002) and S8 was deleted due to misfit and, more importantly, item redundancy, as described in the next section.

Assessment of item redundancy using variable map. On the 20-item variable map, eleven items were concentrated in a narrow range (0 - .60 logits), suggesting that they shared similar levels of difficulty and that several could be removed without significantly altering measurement precision. Within this cluster, four pairs of items (T4/T5, T9/T10, S1/S2, and S8/S9) were identified that were similar in content and difficulty level; one item from each pair was deleted. For example, T4 and T5 both addressed issues of stigma and stereotypes and had nearly identical difficulty values (.27 and .34, respectively), so item T5 was retained and T4 was deleted. Regarding the other three item pairs with similar difficulty estimates, items T9 and T10 dealt with understanding differences between LGBTQ-related concepts, items S1 and S2 addressed inclusion of diverse sexual identities, and items S8 and S9 dealt with how to support SM youth; T9, S2, and S8 were deleted.

Items T1and T2 both addressed being taught about different sexual identities. Item T1 was intended to represent more common terms such as gay and bisexual, and T2 was intended to represent less common terms such as asexual or queer. These items functioned as hypothesized; item T1 was among the easiest items, and T2 was the most difficult item in the set. However, very few people were located near item T2, making it less informative and less well-targeted to the sample than T1. Thus item T2 was deleted. Lastly, item S6 (Right to respectful sex ed) was deleted because it was similar in content to S5 (Respect for all sexual identities) and had a very close difficulty estimate to item T1.

After the deletion of 8 items as described above, a second Rasch analysis was conducted on the remaining 12-item set. In this new analysis, S9 demonstrated the highest misfit (a standardized infit of 2.05, slightly above the acceptable range) and had a very similar difficulty level to T8. Item T10 was also noted to have a very similar difficulty level to item S1 and had some conceptual overlap with gender minority-inclusivity. Thus Items S9 and T10 were deleted to further reduce item misfit and shorten the scale.

After the deletion of ten items from the 20-item set (2 due to misfit, 6 due to item redundancy, and 2 due to both misfit and redundancy), a revised and reduced 10-item set remained. Five items related to the element of Support/Visibility and five items related to the element of Relevant Content.

Evaluation of Reduced 10-item Set

The Rasch analysis was conducted again on the reduced 10-item set. The items on the variable map are generally evenly spaced. However, the most information is provided when there is a close match between item and person location. As seen in the variable map of the preliminary 20-item set, there are many people at the bottom of the scale/continuum who are not 'near' an item, suggesting that many of the items are too 'hard.'

Item misfit was reassessed for the reduced 10-item set. Item infit and outfit mean square values (MNSQ) ranged from .76 – 1.22, well within acceptable limits, and no standardized values (ZSTD) were greater than 2. The final revised scale had a person separation of 2.35 and person reliability of .85 and an item separation of 7.14 with a reliability of .98; all of these values met acceptability criteria. The Cronbach's alpha was .91 and category threshold parameters were ordered as expected. Unidimensionality of the reduced 10-item set was confirmed, with a large

difference between the eigenvalue of Factor 1 (5.11) and Factor 2 (0.59) and Factor 1 accounting for 96% of the variance. The final revised and reduced 10-item scale was named the PISES II.

Conceptual continuum of SM-inclusivity

The empirical results of the Rasch analysis present an emerging conceptual framework or continuum regarding SM-inclusivity. Every item in the scale reflects an important characteristic of or 'task' related to SM-inclusivity, and the variable map suggests how teachers might progress along the continuum to provide higher levels of inclusivity. The variable map suggests that lower levels of SM-inclusivity involve clear expectations of respect for all sexual identities, affirming that being a sexual minority is "normal and acceptable," and being open and responsive to questions about diverse sexual identities from all students. As levels of SM-inclusivity increase, a teacher is likely to teach about diverse sexual identities, including being gay, lesbian, or bisexual, and may use inclusive language such as 'partner' or referring to two boyfriends/girlfriends and regularly include diverse sexual identities in lessons and discussions. At the highest levels of inclusivity, teachers provide instruction about SM-related stigma, safer sex practices for people in SM relationships, online and community resources for SM youth, and the development of sexual identity. It is important to note that this framework is based on SM young adult perceptions of their sex education; it is possible that an analysis of teacher perceptions would place the items in a different order.

Discussion

This study has developed and provided rigorous psychometrics to support a 10-item scale that measures sexual minority-inclusivity in sex education. This new scale is named the Perceived Inclusivity of Sex Education Scale (PISES) II because it is an extensive revision of the original PISES scale introduced by Keiser and colleagues in 2019. The PISES II is based on a

clear, comprehensive definition of SM-inclusivity, and the validity of the construct definition and content validity of the scale items were confirmed by expert review. The 10-item scale had a high Cronbach's alpha ($\alpha = .91$) and exploratory factor analysis supported the unidimensionality of the scale. Rasch analysis suggested acceptable measurement precision (person and item reliability) and response category functioning.

Item-test targeting (the extent to which item difficulty levels match person ability levels) was the only quality indicator that did not meet acceptable criteria. When a scale is well-targeted to its sample, person ability is well-aligned with item difficulty on the continuum. On the variable map, this means that most persons would be located near one or more items. In this study person ability levels were not well-aligned with item difficulty, as many people were located at the bottom of the map while the items were located at notably higher levels. In other words, the items were too hard for the sample, indicating that levels of inclusivity were very low in the sample, and conversely, the items were difficult for respondents to endorse. While this finding might suggest the need to develop easier items for the scale, it is more likely a reflection of very low levels of SM-inclusivity in sex education. This interpretation is corroborated by previous study findings; in a nationally representative sample of over 20,000 sexual and gender minority students, only 12.8% of LGBTQ students reported positive inclusion of any sexual orientation topics during sex education (Kosciw et al., 2018). Studies of sex education teachers in both Minnesota and Illinois have found that teachers report sexual orientation to be one of the least covered topics (Eisenberg et al., 2013; Lindau et al., 2008). Additionally, while more than two-thirds of teachers surveyed in Minnesota thought sexual orientation should be taught, only one-third actually did so (Eisenberg et al., 2013).

Although the variable map reflects the low level of perceived SM-inclusivity in sex education, it also describes what different levels of SM-inclusivity look like in the sex education classroom. Notably, items relating to providing support and affirmation for SM-students are positioned at the easier end of the spectrum. Students may perceive affirmation of their SM-identity through relatively simple teacher actions, such as posting a rainbow flag or making a supportive comment regarding the SGM community. Using inclusive language is closer to the middle of the continuum and may be a relatively harder task for teachers, perhaps because it may involve learning new terminology and remembering to use the new terminology during lessons. Items about receiving instruction about online/community resources for SM youth and development of sexual identity were the hardest for SMYA to endorse, suggesting that these tasks are comparatively more demanding for teachers as well.

Teachers report multiple barriers to teaching about sexual orientation, including lack of training, lack of time, lack of curriculum, concern about responses of parents or school administration, and school or district policy (Eisenberg et al., 2013; Lindberg et al., 2016; Sondag et al., 2020). In particular, a lack of teacher training has been identified as a key reason for a lack of LGBT-inclusive teaching in sex education (Jarpe-Ratner, 2020; Sondag et al., 2020). Teachers may often desire professional development but do not receive it. A majority of teachers (61%) in a 2016 survey of Montana teachers reported “wanting to receive professional development” in teaching students of diverse sexual orientation and gender identity, but only 12% received it (Sondag et al., 2020).

Despite these barriers, recent research suggests that inclusive sex education programs can be successfully implemented. A recent study conducted in New York City high schools demonstrated the feasibility of adapting an existing sex education curriculum to make it more

LGBT-inclusive (Boyce et al., 2018). Teachers were provided with a LGBT supplement directly connected to the existing curriculum and received a 2-day training that included "modeling the LGBT supplemental lesson and discussion of how to adapt all lessons to be more LGBT inclusive" (Boyce et al., 2018, p. 447). Teachers completed 70% of the supplemental LGBT activities on average and students receiving the adapted curriculum reported greater satisfaction and higher knowledge scores compared to the those who did received the unaltered curriculum. Alternatively, an educational intervention specifically designed for SGM youth named IN•clued: Inclusive Healthcare- Youth and Providers Empowered, takes a two-pronged approach by conducting two workshops, one with SGM youth (in schools, community centers, and other settings) and one with local healthcare providers (Philiber, 2021). A recent randomized controlled trial conducted in 16 states concluded that the IN•clued program was effective one year post intervention in reducing incidence of vaginal sex without a condom, increasing sexual health knowledge, and increasing the proportion of SGM youth who accessed contraception from a healthcare provider (Philiber, 2021). This program has been called 'LGBTQ-centered' rather than LGBTQ-inclusive education because it was specifically designed for SGM youth and is not an adaptation of an existing, more heteronormative curriculum.

Future Research

Future research includes assessing the reliability and validity of the PISES II in a larger, more diverse sample. Once reliability and validity are confirmed in a larger sample, the PISES II may be used to assess levels of SM-inclusivity in sex education programs across the United States and assess the efficacy of efforts to make programs more SM-inclusive and examine the impact of SM-inclusivity on SMY sexual and mental health outcomes. Subsequent studies should develop a scale measuring gender minority-inclusivity in sex education and work to

develop robust evidence regarding the feasibility, impact, and implementation of SGM inclusivity efforts. The experiences of SGM youth of color in sex education is an understudied topic (Roberts et al., 2020) and warrants further investigation. Finally, further inquiry is needed to achieve a better understanding of the content and extent of negative messages and stigma experienced by SGM youth during sex education, particularly from a quantitative perspective.

Limitations

There are several limitations in this study that should be acknowledged. This study uses a sample of college students, not a nationally representative sample, which limits the generalizability of the results. Additionally, SMYA who are not involved in sexual minority student groups or who chose not to publicly identify as a sexual minority are less likely to participate in the survey. Fortunately, a non-representative sample is useful in this study because it may still yield accurate information about the statistical properties of a scale (DeVellis, 2017). However, future studies will be needed to confirm reliability in SMYA that are not college educated.

Conclusion

The PISES II provides a promising measurement tool to inform the development and evaluation of sexual minority-inclusive sex education programs. This study used classical test theory methodology to establish the reliability, content validity, and unidimensionality of the 10-item scale. Rasch analysis confirmed sufficient measurement precision, response category functioning, and item fit. Overall the items were difficult for respondents to endorse, which was attributed to low levels of SM-inclusivity in the sample rather than a problem with the scale itself; previous research has indicated very low levels of SM-inclusivity in sex education classrooms. The construct continuum delineated by the Rasch analysis suggests that receiving

instruction about SM-related topics indicates a higher level of SM-inclusivity, while affirmation of SM-identities without instruction in SM-related topics reflects lower levels of SM-inclusivity. This study is the first rigorous psychometric evaluation of a scale measuring SM-inclusivity in the sex education classroom. Further study is required to examine the validity of the PISES II.

Table 1

Demographic characteristics of SMYA ages 18-23 years, N=186

Characteristic	Number *n* (%)
Age in Years	
Mean age in years = 19.7	
18-19	86 (46%)
20-21	86 (46%)
22-23	14 (8%)
Race*	
Asian	20 (11%)
Black	8 (4%)
More than one	15 (8%)
Native Hawaiian/ Pacific Islander	2 (1%)
White	139 (76%)
Ethnicity*	
Latinx/Hispanic	26 (14%)
Gender Identity*	
Female	102 (55%)
Male	41 (22%)
Nonbinary	31 (17%)
Transgender	3 (2%)
Additional identity not listed	7 (4%)
Sexual Identity	
Asexual	8 (4%)
Bisexual	76 (41%)
Gay or lesbian	65 (35%)
Pansexual	7 (4%)
Queer	29 (16%)
Additional identity not listed	1 (<1%)
School Location: Urban or rural*	
Urban/ city	45 (24%)
Suburban	126 (68%)
Rural/ country	13 (7%)
Type of School*	
Public	152 (83%)
Private, non-religious	15 (8%)

Private, religious	17 (9%)
School Location: U.S. Region[a]	
Midwest	12 (6%)
Northeast	132 (71%)
West	9 (5%)
South	33 (18%)
Total Hours of Sex Education**	
Less than three hours	20 (11%)
3-6 hours	33 (18%)
7-10 hours	44 (24%)
11-14 hours	23 (13%)
15 or more hours	63 (34%)

* N=184

**N=183

[a] Regions were defined by U.S. Census Bureau

Figure 1a. Variable map for 20-item set

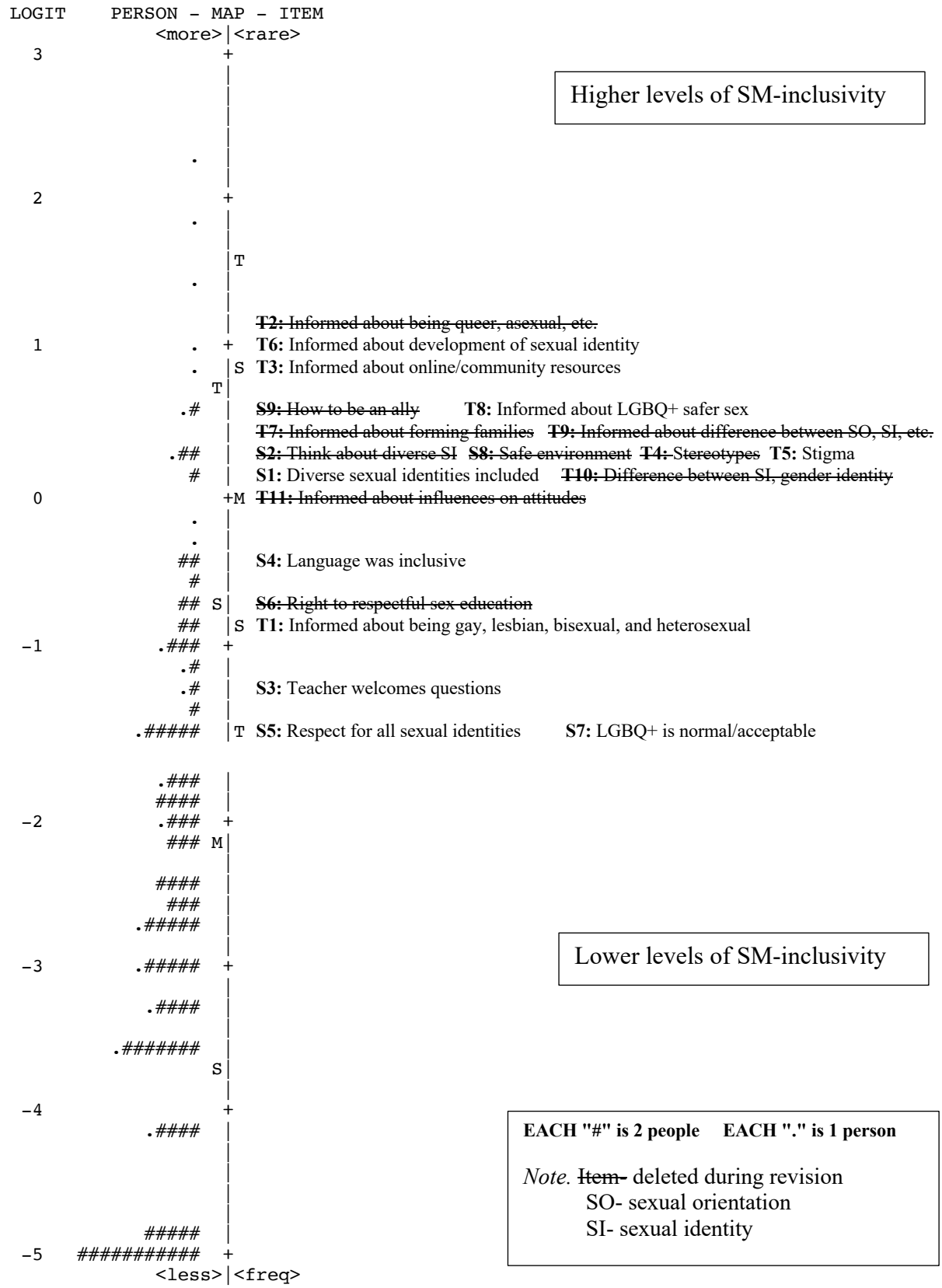

Figure 1b. Variable map for final 10-item PISES II scale

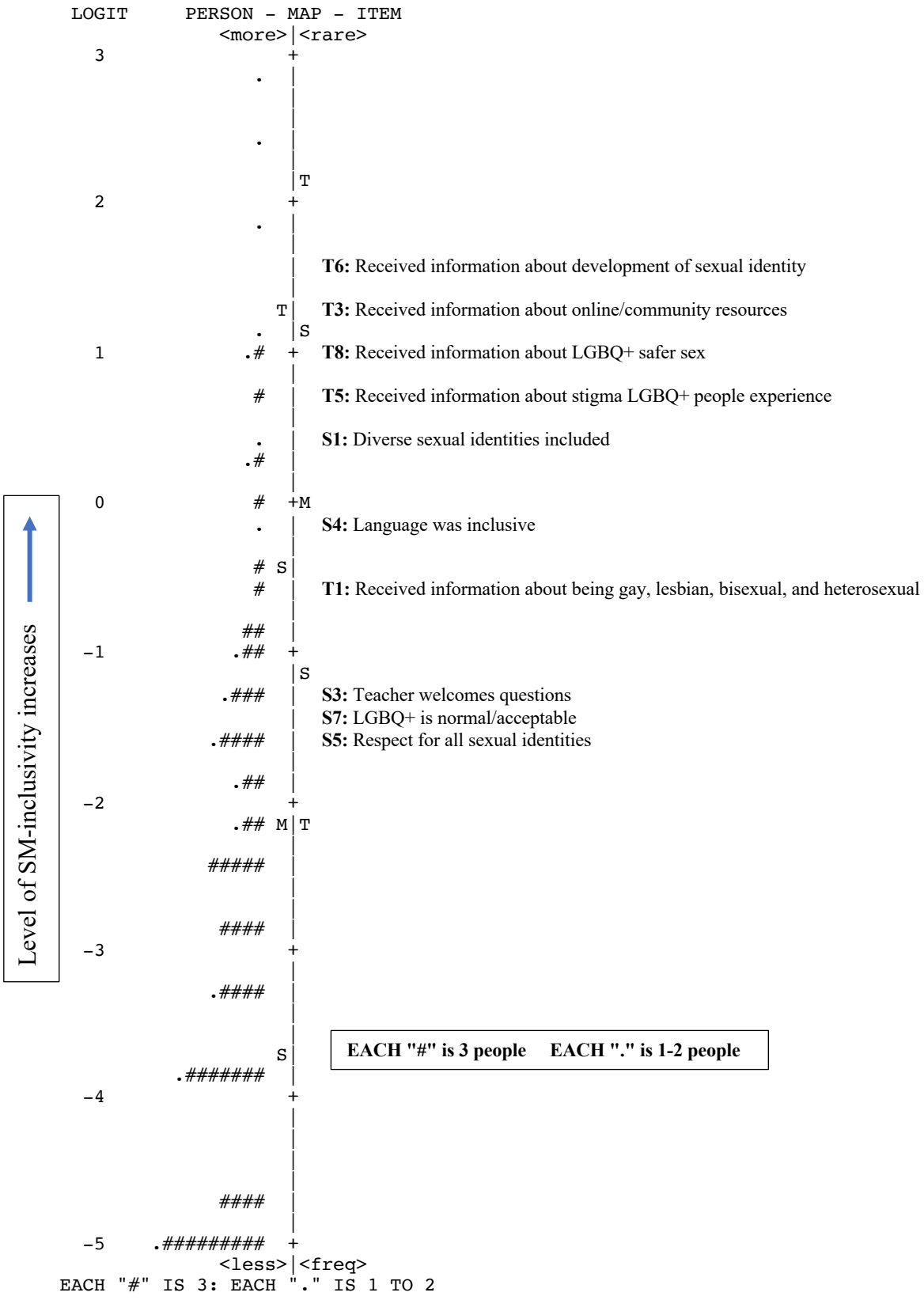

Table 2.
*Rasch item fit statistics and average relevance ratings for the 20-item set***

Item Number	Item	Infit (MNSQ)	Infit (ZSTD)	Outfit (MNSQ)	Outfit (ZSTD)	Item Measure (logit)	Model Standard Error	Average Relevance Rating
During your sex education classes, how much did the following happen?								
S1	**Diverse sexual identities were included in sex education lessons or discussions.**	.70	-2.58*	.67	-2.05*	.08	.14	3.9
S2	My sex education teacher(s) provided opportunities to think about or discuss diverse sexual identities during lessons.	.88	-.92	.75	-1.31	.32	.15	†
S3	**My sex education teacher(s) welcomed well-intentioned questions and comments about diverse sexual identities from all students.**	1.23	1.97	1.25	2.02*	-1.35	.12	2.8
S4	**My sex education used language inclusive of LGBQ+ people and relationships (e.g. partner, two boyfriends/girlfriends).**	1.04	.33	.90	-.64	-.38	.13	3.7
S5	**My sex education teacher(s) made it clear that all sexual identities were welcome in the classroom and would be respected during lessons and discussions.**	.99	-.04	.99	-.07	-1.57	.11	†
S6	My sex education teacher(s) clearly communicated the message that people of all sexual identities have the right to a relevant and respectful sex education.	.93	-.58	.90	-.77	-.73	.13	4.0
S7	**My sex education teacher(s) affirmed that being LGBQ+ is normal and acceptable.**	.75	-2.47*	.69	-2.93*	-1.54	.12	4.0
S8	My sex education teacher(s) discussed actions that our school and/or classroom could take or has already taken to be a safe, affirming environment for people of all sexual identities (e.g. teaching about LGBTQ+ history, displaying posters that show the school/classroom is LGBTQ+ friendly, discussing why anti-LGBTQ+ comments are hurtful).	1.40	2.76*	1.19	1.03	.23	.15	3.8
S9	My sex education teacher(s) discussed how to be an ally to LGBQ+ people (speaking up when you hear anti-LGBTQ+ comments, joining a student-run LGBTQ+ group).	1.24	1.62	1.08	.43	.58	.16	4.0
How much information did you receive in sex education classes at school about the following topics?								
T1	**Being gay, lesbian, bisexual, or heterosexual**	.82	-1.64	1.00	.05	-.82	.12	4.0
T2	Sexual identities outside of gay, lesbian, bisexual, and heterosexual (such as queer, asexual, pansexual, etc.)	.94	-.30	.71	-.98	1.18	.18	3.4
T3	**Online or community resources for LGBQ+ people (websites, health centers, community centers or other organizations)**	.98	-.07	.78	-.91	.79	.17	3.9

T4	Challenging stereotypes or false beliefs related to LGBQ+ people	.90	-.76	1.04	.28	.27	.15	4.0
T5	**Stigma and discrimination that LGBQ+ people may experience**	.86	-1.02	.74	-1.39	.34	.15	3.8
T6	**Development of sexual identity, questioning one's sexual identity, and/or coming out**	.83	-1.13	.69	-1.19	1.02	.18	4.0
T7	Forming families by adoption, insemination, or surrogacy and/or different types of families (such as families with same-gender parents)	1.34	2.30*	1.76*	3.08*	.43	.15	3.4
T8	**How people in LGBQ+ relationships can practice safer sex**	.97	-.19	.78	-1.03	.53	.16	4.0
T9	Difference between sexual orientation, sexual identity, and sexual behavior (sex with females, sex with males, sex with more than one gender, etc.)	1.25	1.74	.91	-.39	.48	.15	3.8
T10	Difference between sexual identity (straight, gay, lesbian, etc.) and gender identity (male, female, transgender, etc.)	.83	-1.35	.72	-1.67	.08	.14	4.0
T11	Influences (peers, media, family, culture, etc.) on one's attitudes and beliefs regarding sexual identity	1.45	3.13*	2.00*	4.50*	.06	.14	3.2

**Bold items are included in the final 10-item PISES II
* <0.5 or >1.5 threshold for MNSQ or >2.0 for ZSTD
† Relevance ratings not obtained for this item

References

Refer to Cumulative Reference List

Chapter 5

Summary of the dissertation

Sexual minority youth currently experience multiple sexual health disparities compared to their heterosexual peers, including higher rates of STIs, unplanned pregnancy, and dating violence (Centers for Disease Control and Prevention, 2019b & 2021; Dank et al., 2014). School-based sex education and parent-adolescent sex communication (PASC) are two important sources of sexual health information that support health development in all youth. This three-manuscript dissertation examined home and school-based learning about sex and sexuality and how it affects the sexual health and behavior of sexual minority youth (SMY). Each manuscript used a different approach to examine how sexual minority youth learn about sex and sexuality. The first manuscript examined and integrated research findings regarding PASC among sexual minority youth (SMY). The second and third manuscript developed new ways to describe and measure sex education with the goal of understanding its impact on SMY. Overall, this dissertation asserts that the sex education that SMY receive both at home and at school does not meet their needs while contributing to a path forward with an extensive revision of a scale designed to measure SM-inclusivity in school-based sex education.

This final chapter will discuss the results of the dissertation as a whole, the methodological, theoretical, clinical, and policy implications of the research, strengths and limitations of the research, and suggestions for future research. The reader is provided with a brief overview of manuscript aims and key findings in Table 1 below.

Table 1.

Specific aims and related findings

Aim	Findings
Aim 1: Describe the experiences and impact of parent-adolescent communication about sex (PASC) among SGM youth by review of prior qualitative and quantitative studies.	• Parents and SGM youth thought PASC was important. • Parents lacked knowledge and comfort in speaking about sex and sexuality. • PASC was infrequent, vague, assumed that being cisgender and heteronormative was normal and preferred, and focused on HIV/STI prevention. • Maternal PASC that was frequent, specific, high quality, and low in negative emotionality (e.g. anger or upset) was linked to positive attitudes and norms regarding condom use among male SGM youth.
Aim 2: Devise a way to use a large data set to describe the total sex education content received by an individual, provide an assessment of the prevalence and impact of different sex education types on sexual intercourse and contraceptive behavior of adolescent females, and examine differences by sexual identity.	• Seven different types of sex education were delineated • Compared to their heterosexual peers, sexual minorities were more likely to report no sex education and less likely to report receipt of abstinence-only education. • All types of education but one had a statistically significant effect on sexual behavioral outcomes (intercourse in the past 12 months and type of contraceptive use) as compared to no sex education. • Each type of sex education had benefits and drawbacks. • This analysis did not find that sex education has a different behavioral effect on heterosexual and sexual minority females ($p=0.065$), but the interaction was close to conventional statistical significance.
Aim 3: Revise and psychometrically evaluate a scale designed to measure sexual minority youth perceptions of sexual-minority inclusivity in sex education.	• The revised scale, named the PISES II, contains 10-items, each related to an element of SM-inclusivity in sex education: support, visibility, and information relevant to sexual minority youth. • This study used classical test theory methodology to establish the reliability, content validity, and unidimensionality of the 10-item scale. • Rasch analysis confirmed sufficient measurement precision, response category functioning, and item fit. • Overall the items were difficult for respondents to endorse, which was attributed to low levels of SM-inclusivity in the sample. • Rasch analysis results outline a construct continuum, with higher levels of SM-inclusivity involving instruction in SM-related topics, and lower levels involving receipt

	of support regarding SM identities but not SM-related instruction

Cumulative Discussion

This dissertation addressed a gap in knowledge about the experiences of SMY with sex education and PASC, as well as the impact of these two sources of sexual health information on SMY health. In this section, specific findings from each chapter will be presented and the results as a whole will be discussed.

Chapter 2, an integrative review of prior research on PASC, identified eleven studies related to PASC among sexual minority youth that met inclusion criteria. Multiple themes emerged across the studies, including infrequent and brief communication that minimized or excluded same-sex attraction and relationships, and youth and parent desire to communicate with each other about sex despite parents' lack of comfort and knowledge. Three quantitative studies examined outcomes of PASC. Results were conflicting, yet the most detailed and rigorous study found that maternal communication that was frequent, specific, and low in emotions such as anger or worry, was associated with positive attitudes toward condom use and intentions to use condoms (Thoma & Huebner, 2018). Chapter 2 concluded that many SGM youth lack sufficient parental education and guidance regarding sexual health and relationships; health providers can provide sexual health education and resources during health care check-ups to support parents' engagement with PASC.

The secondary data analysis presented in Chapter 3 used National Survey of Family Growth (NSFG) data to delineate seven different types of sex education and examine the prevalence and impact of the different sex education types among females ages 15-19 years. The NSFG contains seven survey items asking about sex education content in three main areas:

refraining from sex, contraception, and STIs/HIV. While these are the main topics that are traditionally covered in comprehensive sex education, they were less useful to the purposes of this dissertation they because they did not ask directly about inclusion of sexual orientation topics. However, the data did allow for testing for differences by sexual identity—whether receipt of sex education differed by sexual identity, and whether sex education types affected the sexual behavior (probability of sexual intercourse and contraceptive method use) of heterosexual adolescent females differently than sexual minority females. Differences in receipt of sex education were noted. Compared to their heterosexual peers, sexual minorities were more likely to report no sex education and less likely to report receipt of abstinence-only education. Sexual minorities may be less likely to report receipt of sex education when the information they received was focused on heterosexual concerns and excluded discussion of sexual identity. The analysis did not find that sex education has a different behavioral effect on heterosexual and sexual minority females ($p=0.065$), but the interaction was close enough to conventional statistical significance to warrant further investigation.

In both Chapters 2 and 3, a particular gap in knowledge was identified: measures used to examine PASC and the NSFG's topics-based assessment of sex education did not explore whether SM-specific health concerns were included or otherwise differentiate between communication/education about same-sex and opposite-sex attraction and relationships. Furthermore, support or affirmation for SM identities during PASC or sex education was not assessed. Thus the goal of Chapter 4 was to address the knowledge gap regarding measurement of SM-inclusivity in sex education. Four known studies were identified that quantitatively evaluated SM-inclusivity in sex education, and one of those, a scale named the Perceived Inclusivity of Sex Education Scale (PISES; Keiser et al., 2019) presented an in-depth assessment

of youth perceptions of sexual-minority-inclusivity. However, Keiser et al. (2019) introduced the scale with very little attention to its psychometric properties, did not articulate a definition of the construct of SM-inclusivity, and did not provide a description of the scale development process, which is important for assessing the content validity of the measure (Messick, 1995). Furthermore, many of the items were vague and highly subjective, making the scale less useful for the development and evaluation of SM-inclusive sex education programs. Due to these limitations, the decision was made to revise the PISES scale, as described in detail in Chapter 4. The revised scale, named the PISES II, contains 10-items, each related to an element of SM-inclusivity in sex education: support, visibility, and information relevant to sexual minority youth.

Summary

Overall, this dissertation has highlighted the ways that home and school-based sources of sexual health information do not currently meet the needs of SM youth. The sexual health education of SM youth is complicated by a lack of comfort, knowledge, and resources experienced by both teachers and parents (Eisenberg et al., 2013; Feinstein et al., 2018). Qualitative studies suggest that both sources of sexual health information tend to be focused on heterosexual needs, leaving SMY feeling frustrated and invisible.

This dissertation has also highlighted the need for quantitative measures to extend understanding of the impact of PASC and sex education on SMY. Only one study regarding PASC (Thoma & Huebner, 2018) and one regarding sex education (Keiser et al., 2019) created and utilized in-depth tools for measurement. Valid and reliable measures are needed to aid in both the creation and evaluation of SM-inclusive sexual health programs; the PISES II was developed to address this gap in knowledge.

Taking the results of the three manuscripts together, three key findings of this dissertation are: (1) two key sources of sexual health information, school-based sex education and PASC, are often inadequate among SM youth, (2) rigorously constructed, reliable, and valid measures of SM-inclusivity in sex education and PASC are lacking, and (3) the PISES II shows promise as a reliable measure of SM-inclusivity in sex education, although further study is required to examine its validity.

Implications for Nursing and Health Sciences

Methodological Implications

This dissertation contributes to nursing research by highlighting the need for an increased focus on measurement in nursing research. In many academic fields, it is typical for published studies focused on relationships between variables to greatly outnumber published studies about scale development. Scholars in multiple social science fields have lamented the superficial use of psychometric evaluation techniques and researchers' complacency about measurement of key variables (Gordon, 2015).

Nursing researchers would benefit from an increased focus on IRT (Hagquist et al., 2009), as it facilitates deep thinking about how well a set of items covers the full range of the construct and allows researchers to empirically test their conceptual framework (Gordon, 2015). Notably, IRT has received some attention in other areas of nursing research. A number of nurse scientists have asserted the importance of using IRT in the development of health literacy measures (Nguyen et al., 2015), nursing practice environment (Raju et al., 2014) and nursing self-efficacy scales (Hagquist et al., 2009), and in the evaluation of a Lesbian, Gay, and Bisexual Knowledge and Attitudes scale (Raju et al., 2019).

Additionally, Chapter 3 suggests an innovative way to assess the content in sex education curricula. While sex education programs have been broadly categorized as abstinence-only or comprehensive, this study provides a parsimonious way to describe the total content of a sex education program, creating a more detailed and nuanced way to distinguish between programs. This methodology could be applied to the evaluation of other health promotion and patient education efforts employed by nurses or other health professionals.

Theoretical implications

As described by Meleis (1992, p. 112), the nursing discipline is a human science "predicated on understanding the meanings of daily lived experiences." Furthermore, nursing is concerned with factors that shape human experiences, including "politics, social structures, gender, and culture" (Meleis, 1992, p. 113). With a focus on the human lived experience and social, political, and cultural factors influencing these experiences, this dissertation contributes to the development of nursing knowledge and theory.

The theoretical framework developed for this dissertation combines two theories, Minority Stress Theory (MST; Meyer, 2003) and Information, Motivation, and Behavioral Skills theory (IMB; Fisher et al., 2002), which was originally created as a foundation for HIV/AIDS prevention efforts. As seen in Figure 1 in Chapter 4, the framework outlines how SM youth perceptions of SM-inclusivity may be linked to mental and sexual health outcomes. In this dissertation, 'perceptions of SM-inclusivity' is identified as a specific type or example of stigma and discrimination, a key element of Minority Stress Theory. Importantly, the concept of SM-inclusivity provides a positive reframing of the concept of stigma. This theoretical framework provides a novel mechanism to explain how experiences with stigma can impact learning about sexual health, mental health, and sexual behavior.

The need to provide SM-inclusive health information extends beyond the sex education classroom, and the theoretical framework of this dissertation can be applied to patient and family education efforts more broadly. For example, clinical nurses and nurse researchers can assess whether patient and family education programs assure SM individuals that they are seen and affirmed, and whether SM-relevant information (including sexual and gender diversity, bullying, and suicide prevention) is provided when appropriate.

Clinical Practice Implications

Providing SM-inclusive sexual health information. School nurses can directly provide SM-inclusive sexual health education, either by classroom presentations, small group discussions during students' lunch or free periods, or, when allowed by state policies, teaching health classes as part of their regularly assigned duties (Jackson, 2011). Additionally, pamphlets and information about SM health can be made available at the school nurse office and posting articles about SM health in parent newsletters or online school newspapers can inform readers about services available at the nursing office (Jackson, 2011). Similarly, nurses at pediatric offices could offer sexual health classes outside of school hours that are inclusive of SM youth; these classes could be available to both parents and youths. In both school and pediatric office settings, nurses can directly communicate their support of SM youth through display of a visible sign, such as a safe space sticker or pride flag in their office (Human Rights Campaign, 2019) and along with all school or office staff, work to use non-heteronormative language and appropriate pronouns (Kosciw et al., 2020).

Encouraging parents and children to discuss sex and sexuality. Nurses can also directly encourage parents to speak with their children about sex and sexuality. In a small recent randomized controlled trial, nursing students delivered an intervention named *Families Talking*

Together, which encourages family-based communication about sex. Treatment group parents received a 30-minute session with a trained student nurse, who gave parents information and resources to support PASC (Santa Maria et al., 2018). The intervention was found to significantly increase the frequency of PASC at the one-month follow up (Santa Maria et al., 2018). The student nurses experienced benefits as well, including increased self-efficacy for sexual health counseling and experience gained as a sexual health educator (Santa Maria et al., 2017b). An earlier study of *Families Talking Together* with social work interventionists found that adolescents whose parents participated in the intervention were significantly less likely to start having vaginal intercourse in the nine-month period following the intervention (Guilamo-Ramos et al., 2011).

The Society of Adolescent Health and Medicine (SAHM) Position Paper recommends that youth-serving professionals urge parents and adolescents to have open conversations about sex (SAHM, 2014). Santa Maria et al. (2017a) further suggest that nurses encourage parents at every health care appointment to communicate with their child about sex (before the child has become sexually active). Parent counseling can occur while the adolescent meets individually with the health care provider.

Policy Implications

Currently the United States has a patchwork of state laws regarding sex education rather than a standard national sex education program. In May of 2021, however, the Real Education and Access for Healthy Youth Act was introduced in the U.S. Congress, a bill that would require funded sex education programs to be SGM inclusive (Human Rights Campaign, 2021). Although introduction of this bill was a positive development, it was subsequently referred to committee

and no official action has been taken in the past year (Real Education and Access for Health Youth Act of 2021, 2021).

Progress at the state level has been uneven. A negative development was the passage of the bill in early 2022 known as “Don’t Say Gay” that forbids discussion of sexual orientation and gender identity in kindergarten through third grade in Florida (Block, 2022). The enactment of this bill highlights the stigma and discrimination that SGM students may face in schools and the need for laws to support the welfare of SGM youth. In Massachusetts, the Healthy Youth Act, a state senate bill (S.2541) that mandates that sex education, when taught, must be comprehensive and LGBTQ+ inclusive, was introduced in 2015 (SIECUS, 2022). Despite having more than 60 cosponsors, the bill was not brought to the senate floor for a vote in the fall of 2021 and instead was referred to committee (MAlegislature.gov, 2022); the future of the Healthy Youth Act in Massachusetts remains uncertain.

Nurses can advocate at local, state, and national levels for comprehensive, medically accurate, developmentally appropriate, and SGM-inclusive sex education. The National Association of School Nurses (2017) position statement encouraged school nurse leaders, along with parents, health educators, and school administrators, to advocate for sexual health education that includes the needs of all youth. Additionally, nurse scholars have emphasized the role of both school nurses and public health nurses in advocating for and implementing comprehensive sexual health education (Dickson & Lobo, 2018; Dickson & Brindis, 2021). Finally, nurses can promote SGM-inclusive sex education at a district-wide or individual school level by assessing sex education curricula for accuracy, diversity, and SM-inclusivity (Kosciw et al., 2020).

Studies have suggested that nurses lack adequate training and education in LGBTQ health and in delivering sexual health information (Brewin et al., 2014; Sherman et al., 2021).

Nurses can advocate for increased support and training for both nursing faculty and nursing students regarding provision of SM-inclusive sexual health information.

Strengths and Limitations

This dissertation has multiple strengths. First, the lack of nursing research related to the SGM health and well-being has been noted in recent literature (Jackman et al., 2019); this dissertation contributes to an emerging body of nursing research focused on this vulnerable population. Second, this dissertation increases nursing knowledge about measurement through its use and explanations of IRT methodology and emphasis on a developing a novel and effective way to delineate different types of sex education. Third, this body of research extends nursing theory by proposing a comprehensive and detailed definition of SM-inclusivity in health education as well as combining and expanding two existing theoretical frameworks to show how SM-inclusivity may affect mental and sexual health outcomes.

This dissertation has several limitations that should be noted. This body of research did not address the ways that race/ethnicity, socioeconomic status, or urbanicity of residence may impact the experiences of SM youth. Similarly, the scale revision study utilized a relatively small sample lacking in racial, ethnic, and socioeconomic diversity. Furthermore, this research did not differentiate between different identities that reside under the 'sexual minority' umbrella. People who identify as different identities such as gay, asexual, queer, or bisexual may in fact have distinct experiences. Notably, compared to monosexual individuals, bisexual people face an increased level of health disparities and may face negative attitudes from the LGBTQ+ community as well as the heterosexual community (Feinstein & Dyar, 2017).

Future Research

Future research should include greater diversity of samples and seek to uncover the impact of having a multiple minority status (such as the intersection of race/ethnicity and minority sexual orientation). Additional studies are needed to examine and compare the sex education experiences of individuals who identify as bisexual, questioning, asexual, and so on, as well as the impact of residing in a rural or urban environment.

Other goals for research include assessing the reliability and validity of the PISES II scale in a larger, more racially, ethnically, and socioeconomically diverse sample of 300-350 SMYA. Once validity and reliability are confirmed in a larger sample, the new scale may be used to examine the impact of SM-inclusivity on SMY health outcomes, including whether high levels of SM-inclusivity in sex education reduce sexual risk behaviors and increase determinants of sexual well-being, such as sexual and reproductive empowerment and sexual communication skills.

Future studies may also investigate how perceived SM-inclusivity varies by gender, race/ethnicity, socioeconomic status, and geographic region. Studies are needed to develop a gender diverse/trans-inclusivity scale and evaluate sexual health interventions that adapt their curriculum to be inclusive of sexual and gender minority (SGM) needs. Finally, the scale may be adapted to measure SGM-inclusivity in other sources of sexual health information, such as health care provider communication with patients and parent-child communication about sexual health.

Conclusion

This dissertation examined sources of sexual health information of sexual minority youth with a focus on parent-adolescent sex communication and school-based sex education. This body of research has made methodological and theoretical contributions to nursing research and

suggests multiple ways that nurses can become involved in providing or promoting SM-inclusive communication and education. The PISES II enhances the science of measurement of SM-inclusivity and will ultimately contribute to the development of programs and interventions to support SM-inclusivity in school-based, family-based, and healthcare provider-based sexual health education.

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Cumulative Reference List

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Appendix 1: Recruitment Emails

Recruitment email for interview

Dear [participant/name],

My name is Anne McKay and I am a PhD student in the Connell School of Nursing at Boston College studying the experiences of male sexual minority students with sex education in school. I am writing to invite you to participate in a research study. In the study, participants will be asked to talk about their thoughts and reactions to a short list of survey items on a questionnaire, which should take about 30-45 minutes. In order to be eligible to participate, you must be between 18-23 years old, identify as a sexual minority (gay, lesbian, bisexual, queer, pansexual, asexual, etc), identify as cisgender (your assigned sex at birth was male and you identify as male), be a U.S. resident and read English.
Participating in this study is completely voluntary and you are free to stop at any time. If you decide to participate in the study, you will be compensated with a $15 gift card. We hope to use the results of this research to help make sex education more supportive of and useful to sexual minority students.
If you would like more information about being in this study, you can contact me, Anne McKay, at mckayec@bc.edu. If you know someone who may be a good fit for this study, please feel free to forward this email to them.

Sincerely,

Anne McKay

Recruitment email for survey

Dear [participant/name],

My name is Anne McKay and I am a PhD student in the Connell School of Nursing at Boston College studying the experiences of male sexual minority students with sex education in school. I am writing to invite you to participate in a research study. In the study, participants will be asked to complete a short survey, which should take about 15-20 minutes. In order to be eligible to participate, you must be between 18-23 years old, identify as a sexual minority (gay, lesbian, bisexual, queer, pansexual, asexual, etc), identify as cisgender (your assigned sex at birth was male and you identify as male), be a U.S. resident and read English.
Participating in this study is completely voluntary and you are free to stop at any time. If you decide to participate in the study, you will be compensated with a $15 gift card. We hope to use the results of this research to help make sex education more supportive of and useful to sexual minority students.
If you would like more information about being in this study, you can contact me, Anne McKay, at mckayec@bc.edu. If you know someone who may be a good fit for this study, please feel free to forward this email to them.

Sincerely,

Anne McKay

Appendix 2: Consent Form for Think Aloud

Boston College Consent Form
Boston College Connell School of Nursing
Informed Consent to be in the study named "Revising and Testing a Scale to Measure the Inclusion of Sexual Minorities in Sex Education"
Researcher: Anne McKay
Type of consent: Adult Consent Form

Invitation to be Part of a Research Study

You are invited to participate in a research study. You were selected to be in the study because you are between the ages of 18-23 and identify as both a cisgender male and a sexual minority. Taking part in this research project is voluntary.

What is the study about and why are we doing it?

The purpose of this study is to revise a questionnaire about how sexual minorities feel about their sex education experiences in school. We want to hear your voice to help improve sex education for younger sexual minority youth. About 4-5 young adults like you will help us to revise the questionnaire.

What will happen if you take part in this study?

The questionnaire contains 10-15 items about school-based sex education. If you agree to take part in this study, you will be asked to talk about your reactions to each item on the questionnaire. This "think-aloud" will include whether the meaning of the question is clear and whether any items should be added to or deleted from the questionnaire. **The think-aloud will take place via Zoom. You will speak individually with the researcher- this is not a focus group format.** With your permission, the session will be audio-recorded. We expect this to take about 30-45 minutes.

The questionnaire asks respondents to indicate how much they agree or disagree with each item. The following is an example of an item: *My sex education included content relevant to my sexual orientation. (1=Strongly Disagree, 7=Strongly Agree)*

How could you benefit from this study?

There will be no direct benefit to you for participating in this survey. The results of this project may help improve sex education for sexual minority students.

What risks might result from being in this study?

We believe there little to no risk to you for participating in this research project, but there may be unknown risks. You may become stressed or uncomfortable answering any of the survey

questions. If you do become stressed or uncomfortable, you can skip the question or take a break. You can also stop taking the survey or you can withdraw from the project altogether.

How will we protect your information?

We will assign to each participant a unique, coded identifier (a pseudonym) that will be used in place of actual identifiers. **If you would like to receive the $15 gift card, we will send it to the email address with which you contacted us, or you may provide a preferred email address at the beginning of the interview. Otherwise, we are not collecting any personal information, such as your name or address.**
We will keep all study data secure in a locked filing cabinet in a locked office/ encrypted on a password protected computer.

The records of this study will be kept private. In any sort of report we may publish, we will not include any information that will make it possible to identify you.
Only the research team will have access to the audio recordings and the recordings will be deleted after the study is completed.

The Institutional Review Board at Boston College and internal Boston College auditors may review the research records. State or federal laws or court orders may also require that information from your research study records be released. Otherwise, the researchers will not release to others any information that identifies you unless you give your permission, or unless we are legally required to do so.

What will happen to the information we collect about you after the study is over?

We will not keep your research data to use for future research or other purpose. We will not share your research data with other investigators.

How will we compensate you for being part of the study?

You can choose or not choose to accept compensation. You will be offered a $15 gift card at the end of the think-aloud session even if you end the session early.

What are the costs to you to be part of the study?

There is no cost to you to be in this research study.

Your Participation in this Study is Voluntary

It is totally up to you to decide to be in this research study. Participating in this study is voluntary. Even if you decide to be part of the study now, you may change your mind and stop at any time. You do not have to answer any questions you do not want to answer. You may withdraw from this study at any time.
If you choose not to be in this study, it will not affect your current or future relations with the University.

Getting Dismissed from the Study

The researcher may dismiss you from the study at any time for the following reasons: (1) it is in your best interests (e.g. side effects or distress have resulted), (2) you have failed to comply with the study rules.

Contact Information for the Study Team and Questions about the Research

If you have questions about this research, you may contact Anne McKay at mckayec@bc.edu or Allyssa Harris at harrisal@bc.edu or 617- 552-0550.

Contact Information for Questions about Your Rights as a Research Participant

If you have questions about your rights as a research participant, or wish to obtain information, ask questions, or discuss any concerns about this study with someone other than the researcher(s), please contact the following:

Boston College
Office for Research Protections
Phone: (617) 552-4778
Email: irb@bc.edu

Your Consent

By signing this document, you are agreeing to be in this study. Make sure you understand what the study is about before you sign. We will give you a copy of this document for your records. We will keep a copy with the study records. If you have any questions about the study after you sign this document, you can contact the study team using the information provided above.

I understand what the study is about and my questions so far have been answered. I agree to take part in this study.

_____
Printed Subject Name

_____
Signature Date

☐ Check to indicate that a copy of the informed consent form was received.

Consent to be Audio/video Recorded
I agree to be audio recorded.

YES_____ ***NO***_____

_____
Signature Date

Appendix 3: Consent Form for Survey

Boston College Consent Form
Boston College Connell School of Nursing
Informed Consent to be in the study named "Revising and Testing a Scale to Measure the Inclusion of Sexual Minorities in Sex Education"
Researcher: Anne McKay
Study Sponsor: Sigma Theta Tau International
Type of consent: Adult Consent Form

Invitation to be Part of a Research Study

You are invited to participate in a research study. You were selected to be in the study because you identify as a sexual minority, a cisgender male, and are between the ages of 18-23. Taking part in this research project is voluntary.

What is the study about and why are we doing it?

In this study you have an opportunity to share your experiences with sex education in school. We want to hear your voice to help improve sex education for younger sexual minority youth. The total number of people in this study is expected to be 150-200.

What will happen if you take part in this study?

If you agree to take part in this study, **you will be asked to fill out an online survey**. We expect this to take about 10-15 minutes.

How could you benefit from this study?

There will be no direct benefit to you for participating in this survey. The results of this project may help improve sex education for sexual minority students.

What risks might result from being in this study?

We believe there little to no risk to you for participating in this research project, but there may be unknown risks. You may become stressed or uncomfortable answering any of the survey questions. If you do become stressed or uncomfortable, you can skip the question or take a break. You can also stop taking the survey or you can withdraw from the project altogether.

How will we protect your information?

If you would like to receive the $15 gift card, you will need to provide a first name (or ok to use a pseudonum) and a preferred email address in a separate, brief survey. Otherwise, we are not collecting any personal information, such as your name or address. We will not be able to connect your survey responses to the name and email address you give us in order to receive the gift card.

We will keep all study data secure in a locked filing cabinet in a locked office/ encrypted on a password protected computer.

The records of this study will be kept private. In any sort of report we may publish, we will not include any information that will make it possible to identify you.

The Institutional Review Board at Boston College and internal Boston College auditors may review the research records. State or federal laws or court orders may also require that information from your research study records be released. Otherwise, the researchers will not release to others any information that identifies you unless you give your permission, or unless we are legally required to do so.

What will happen to the information we collect about you after the study is over?

We will not keep your research data to use for future research or other purpose. We will not share your research data with other investigators.

How will we compensate you for being part of the study?

You can choose or not choose to accept compensation. You will be offered a $15 gift card at the end of the study survey even if you end the survey early. All gift cards will be distributed via email within 3 weeks. We will provide you a separate link at the end of the survey where you can volunteer to provide a first name only (or ok to use a pseudonym) and a preferred email address (ok to use your university or a personal email address). This name and email will be kept confidential and will be destroyed at the end of the study. There is no way to connect your name and email to the answers you provided on the study survey. We thank you in advance for your time and effort in participating in this research project.

What are the costs to you to be part of the study?

There is no cost to you to be in this research study.

Your Participation in this Study is Voluntary

It is totally up to you to decide to be in this research study. Participating in this study is voluntary. Even if you decide to be part of the study now, you may change your mind and stop at any time. You do not have to answer any questions you do not want to answer. You may withdraw from this study at any time.

If you choose not to be in this study, it will not affect your current or future relations with the University.

Getting Dismissed from the Study

The researcher may dismiss you from the study at any time for the following reasons: (1) it is in your best interests (e.g. side effects or distress have resulted), (2) you have failed to comply with the study rules.

Contact Information for the Study Team and Questions about the Research

If you have questions about this research, you may contact Anne McKay at mckayec@bc.edu or Allyssa Harris at harrisal@bc.edu or 617- 552-0550.

Contact Information for Questions about Your Rights as a Research Participant

If you have questions about your rights as a research participant, or wish to obtain information, ask questions, or discuss any concerns about this study with someone other than the researcher(s), please contact the following:

Boston College
Office for Research Protections
Phone: (617) 552-4778
Email: irb@bc.edu

Your Consent

Before agreeing to be part of this research, please be sure that you understand what the study is about. You can print a copy of the document for your records. If you have any questions about the study later, you can contact the study team using the information provided above.

Appendix 4: Think-Aloud Script

Exploring Perceptions of Sexual Minority Inclusivity in Sex Education

Welcome!
I am interested in the experiences of sexual minority youth with sex education. I am working to develop a questionnaire to measure how well sex education is meeting the needs of sexual minority youth. The purpose of this interview is to evaluate the questions in this survey. I want to check to make sure the questions make sense to you and that people understand what we meant when we wrote the questions. To do this, I am going to ask you to do a "think-aloud". As you answer each question, I will ask you to read each question aloud and then think out loud as you decide how to answer the question. Please tell me everything you are thinking and talk out loud constantly. You can pretend that you are alone and just speaking to yourself. You don't need to explain to me what you are saying or plan what you are going to say. If you are silent for a while, I will prompt you to talk. You have given me permission to record what you say, so I will be recording what you say. Please try to speak as clearly as you can. We will do a short practice example first to make sure you understand what to do. Do you have any questions about what you should do?

If participants are silent for more than 10 seconds or need guidance, the interviewer may prompt them to "Keep thinking out loud" *or ask a question below (Trenor et al., 2011):*
* "What do you think this question is asking you?"
* "How do you think you should answer this question?"
* "Is this question confusing? If so, what would make this question less confusing?"
* "What are you thinking about?"
* "How did you arrive at that answer?"
* "What does [a specific word/concept] mean to you?"

At the end of the survey, participants will be asked:
- Thinking back on the questions you just answered, does anything else seem confusing?
- What other questions do you think should be on the questionnaire?
- What questions do you think should be removed?
- What would you change about the questionnaire?

Thank you for your time and for sharing your thoughts!