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The impact of sexual education and socialization on sexual satisfaction, attitudes, and self-efficacy

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This study examined the relation between school-based sexual education and parental messages about sex received in adolescence, and sexual attitudes and experiences in young adulthood. Participants—99 Canadian undergraduate students aged 17–25 years—reported that their sexual education largely focused on traditional topics (e.g., negative health outcomes, physiology, etc.), while social and emotional topics were less likely to be formally covered. Parental sexual socialization that was more comfortable and accepting of teen sexuality was related to more permissive sexual attitudes in young adults, but was unrelated to self-efficacy or sexual satisfaction. When all variables were examined using hierarchical regression, sexual education and parental socialization did not predict sexual satisfaction. However, mediation analysis revealed an indirect effect of sexual self-efficacy on the relation between sexual education and sexual satisfaction. More comprehensive and higher-quality sexual education increased sexual self-efficacy, which was then related to higher sexual satisfaction beyond the role of gender and relationship status. This provides insight into the mechanism by which sexual education in Canada may impact sexual satisfaction. The influence of parental socialization and school-based sexual education are apparent and complementary. Both sources of information and values (parents/school) offered benefits for young adults' positive sexual attitudes, but school-based education appears to be key. How sexual education is delivered (e.g., if teachers are knowledgeable and comfortable discussing topics) may be even more important than the content itself. These findings suggest that prioritizing teacher training to improve their comfort with delivery of sexual education programming would improve adolescents and young adults' sexual lives.

KEYWORDS: Sexual attitudes, sexual education, sexual satisfaction, socialization

Young people learn about sex from a variety of sources, including their peers, parents, and information online. The messages young people are exposed to during adolescence influence sexual behaviour, attitudes (Marston & King, 2006), and sexual enjoyment (Galinsky & Sonenstein, 2011, 2013). The current study examined two sources of adolescents' sexual knowledge and values in a Canadian sample: formal sex education presented in schools and parents' socialization of their children's sexual attitudes and behaviour. Our goal was to investigate the relationship between aspects of school sex education (e.g., the comprehensiveness of topics covered, quality of delivery) and the sexual socialization received from parents on adolescents' current sexual attitudes, sexual self-efficacy, and sexual satisfaction.

Adolescence is a time of discovery—characterized by transition, physical and cognitive changes, the exploration of new experiences, and the development of one's sense of identity (Dahl et al., 2018; de Graaf et al., 2009; Sharp et al., 2007). One defining feature of adolescence is puberty and the hormonal changes

that accompany it (Arain et al., 2013; Moore & Rosenthal, 2007; Peper & Dahl 2013). This process creates a cascade of reproductive and non-reproductive transformations, ultimately leading to physical growth and sexual maturation (Arain et al., 2013; Fortenberry, 2013; Moore & Rosenthal, 2007). It is not surprising, therefore, that most people start learning about sexuality and sexual behaviour during adolescence (e.g., de Graaf et al., 2009), with one-quarter of Canadian youth engaging in sexual intercourse by the age of 16 (Statistics Canada, 2015).

With the vast amount of information available on the internet, sexually explicit material is more accessible than ever. Research from numerous countries, including Canada, has shown that a sizable minority of youth deliberately seek out pornographic content online (Farré et al., 2020; Owens et al., 2012; Peter & Valkenburg, 2016; Rowland & Uriel, 2020). Learning about sex from pornography can be problematic for several reasons. First, mainstream pornography reinforces sexist and racist assumptions about sexuality and contains a high proportion of

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sexually explicit content that features dehumanization of and violence against women (e.g., Bridges et al., 2010; Cowan, 1995; Fritz et al., 2020). Second, pornography is made for entertainment, not instructional purposes. The information depicted is often exaggerated, unrealistic (Rothman et al., 2021), and rarely portrays safer sex practices (Vogel, 2011). This may be an issue, as one study (albeit with a small sample size) found that young people tend to imitate the behaviours seen in pornography (e.g., not using condoms)—especially, in the absence of adequate sexual education (Rothman et al., 2015). Research by Wright et al. (2019) with adult men suggests that these effects of pornography are present *only* for those who believe pornography is a good source of sexual information. This belief may be more likely when information from other sources is lacking. Relatedly, Wright et al.'s (2020) analysis from a United States national, representative sample of adolescents found that parental communication mitigated the effect of pornography on condom disuse. In other words, the more parents talked to their kids about sex, the less likely pornography was to influence teenagers' decisions around not using condoms during sex.

Children learn about sexuality, modesty, gender norms, physical development, and sexual behaviours from a variety of sources, including their parents (Jerman & Constantine, 2010; Tolman & McClelland, 2011). Indeed, many parents believe they have a responsibility to educate their children about sexuality and prevent negative sexual health consequences (Diiorio et al., 2003; Wilson et al., 2010). How parents talk with their kids about sex can influence adolescents' attitudes toward sex, sexual self-efficacy (Goldman, 2008; Rogers, 2017), and decisions around sexual activity (Aspy et al., 2007; Widman et al., 2016). Sexual self-efficacy refers to the confidence in one's ability to engage in or avoid various sexual practices or situations (Koch et al., 2013). This may involve the ability to use contraceptives or to avoid unwanted sexual situations.

In his systematic review of research on parent-adolescent communication and risky sexual behaviours, Rogers (2017) proposed that sexual attitudes, perceived norms, and sexual self-efficacy mediate the relationship between parental sexual socialization and adolescent sexual intentions which, subsequently, influence behaviour change. He found support for the role of sexual attitudes and sexual self-efficacy as the mechanisms by which parental sexual socialization impacts adolescent sexual intentions and behaviour (although it should be noted that most studies reviewed were based on parents and teens in the United States). Schalet (2011) argued that positive parental-adolescent communication about sexuality can foster feelings of support, self-awareness, and increased acceptance of sexual behaviours in adolescents. Following this reasoning, encouraging teenagers to acknowledge their own sexuality, would make them better able to plan for and negotiate sexual interactions, and more likely to seek out guidance when needed. This would set the stage for positive sexual experiences and outcomes—primarily, through the development of sexual autonomy and self-efficacy.

Sexual autonomy (i.e., understanding sexual pleasure and desire, communicating boundaries and wishes, and learning how to engage in sexual activity) is an important component

of adolescents' sexual socialization (Schalet, 2011). According to Schalet (2011) sexual autonomy brings with it the realization that youths' sexual desires are distinct from those of others engendering feelings of control over their decisions to engage in sexual activity or not. This sense of control helps youth take a slower approach to sex—allowing them to evaluate their desires, better navigate intimate situations, and move forward when comfortable (Schalet, 2011). Greater confidence, knowledge, and perceived control may also culminate in greater sexual satisfaction (Schalet, 2011). Schalet's (2011) reasoning is supported by de Graaf and colleagues' (2005; as cited in de Graaf et al., 2009) study in which Dutch youth who reported greater autonomy were more likely to describe their first sexual experiences as enjoyable, wanted, and well-timed.

Despite feeling obligated to talk to their children about sex, many parents find it difficult to do so (Diiorio et al., 2003; Malacane & Beckmeyer, 2016; Widman et al., 2016). The reasons for this discomfort are varied. According to Malacane and Beckmeyer (2016), parents may not feel knowledgeable or comfortable enough to engage in conversation about sexual health. When they do broach the subject, parents tend to discuss topics indirectly, superficially, or fail to discuss important topics altogether (e.g., birth control or pleasure). Parents may also avoid discussing sexual health because of concerns around age-appropriateness of the content. Because parents are rarely adolescents' primary resource for sexual health information, the need for formal sexual health education is evident (Malacane & Beckmeyer, 2016).

In fact, research shows that the majority of youth in Canada and the United Kingdom reported school to be the most useful and preferred source of information regarding sexuality (Boyce et al., 2003; Coleman & Testa, 2007; Newby et al., 2012). Cohen and colleagues (2004) surveyed Canadian teachers and found that 93% supported sexual health education being provided in schools. Interestingly, only 35% of these teachers were trained to teach sexual health, even though most of them (85%) were required to teach the topic. This is disconcerting, as research shows that it is important to students that teachers are comfortable discussing sexual health topics (Byers et al., 2013).

Sex education has long been a subject of debate in Canada. For example, in 2015, Premier Kathleen Wynne introduced an updated curriculum in Ontario that included information on diversity, sexting, and consent (Bialystok, 2019). A small but vocal group of parents and conservative politicians criticized the program and, in 2018, the new Premier, Doug Ford, repealed Wynne's curriculum and reinstated the previous and outdated 1998 curriculum. Ford faced considerable backlash for this action and, in 2019, he released a new sex-ed curriculum, which closely resembled the repealed model. Although the public largely supported the new curriculum, unhappy parents were given the option to withdraw their children from sex education classes (Bialystok, 2019).

This controversy, no matter the jurisdiction, is usually fueled by the clash of ideological values (conservative/restrictive vs. liberal/permissive) and misinformation about the impact of sex education on teen sexuality. One common misconception is that teaching adolescents about sex and contraceptive use will cause them to engage in promiscuous sexual activity—increasing the

likelihood of teen pregnancy (Goldman, 2008; Sabia, 2006). In fact, school-based sexual education has been shown to contribute to positive sexual health outcomes, such as increased condom use, delayed initiation of sexual activity, and less risky sexual behaviour (Bourke et al., 2014; Lindberg & Maddow-Zimet, 2012, UNESCO, 2018).

Research has overwhelmingly shown that comprehensive sex education is linked to increased adoption of safer sex practices and positive sexual health attitudes (Bourke et al., 2014; Lindberg & Maddow-Zimet, 2012; UNESCO, 2018; Weaver et al., 2005). Exposure to comprehensive sexual education is believed to be the most effective means of promoting adolescents' safe and healthy exploration of their own sexuality (Lindberg & Maddow-Zimet, 2012; Schmidt et al., 2015; Weaver et al., 2005). In the United States, sexual education has traditionally followed two paradigms: (1) the abstinence-only model and, (2) the sex-as-risk model (Schalet, 2011). Both paradigms construe adolescent sexuality as dangerous and something to be controlled. Although early sex education programs in Canada also dealt with abstinence and contraceptive use as a means of avoiding sexually transmitted infections, abstinence-only programs have never been the norm in Canadian schools, except for Roman Catholic denominational schools where premarital sex is proscribed (Maticka-Tyndale et al., 2001).

Research has shown that the messages adolescents and young adults receive about sex vary according to their gender (Evans, Widman, Kamke, et al., 2020; Levin et al., 2012; Tolman, 2002; Wilson & Koo, 2010). Thousands of studies have investigated the sexual double standard applied to men and women since its conceptualization by Reiss (1964). In this sexual double standard discourse, young women are socialized to be modest, yet passive (Tolman, 2002). The messages they receive focus on the risks and negative consequences of sex (Fine, 1988; Fine & McClelland, 2006; Levin et al., 2012). In contrast, young men are taught that sexuality is about exploration and pleasure, and that promiscuity and pre-marital sex are acceptable (Morgan et al., 2010; Petersen & Hyde, 2011). These gendered messages impact individuals' behaviours, attitudes, and experiences. For instance, a meta-analysis by Petersen and Hyde (2011) found that men consistently reported higher levels of sexual satisfaction than women. Thus, it is important to consider the contributions of gender when investigating sexuality.

Finally, research has suggested that relationship status (Pedersen & Blekesaune, 2003) and sexual experience contribute to sexual satisfaction (Peter & Valkenburg, 2009). Peter and Valkenburg (2009) found that sexual experience moderated the relationship between exposure to online sexually explicit content and sexual satisfaction in Dutch adolescents (Peter & Valkenburg, 2009). Young Norwegian adults in a committed relationship reported greater sexual satisfaction than those who were single (Pedersen & Blekesaune, 2003). Consequently, any research on sexual satisfaction should take sexual experience and relationship status into consideration.

Most published sexual education research involves American or European samples. Sexuality research on Canadian samples is limited. Sandra Byers, renowned for her work on sexual

satisfaction, sexual education, and sexual communication, has lamented that a major limitation of her research is the lack of diversity in her study samples (Byers, 2011). Her research is conducted in New Brunswick where university students are largely heterosexual and of White, European descent. The current study seeks to fill this gap by collecting data in Windsor, Ontario—one of Canada's most culturally diverse communities (Statistics Canada, 2017).

The Canadian Guidelines for Sexual Health Education (Public Health Agency of Canada, 2008) provides a framework that offers the potential for a comprehensive sexual education program. Ontario's revamped sex-ed curriculum offers a similar potential. Unfortunately, comprehensive sexual education is not guaranteed. A recent study conducted by Action Canada for Sexual Health & Rights (2020) revealed that sex-ed programs in Canada vary by province. Furthermore, the content and quality of these programs is contingent on geographical factors (e.g., province, school board, proximity to local health centres), instructor factors (e.g., expertise, values, and comfort teaching sex-ed), and access to resources (e.g., community income, access to training/support, access to external educators). Therefore, the current study also evaluated the comprehensiveness of sexual education students received.

Finally, much of extant research focuses on the effect of sex education on risk-taking behaviours in adolescents (Evans, Widman, & Goldey, 2020; Kirby & Laris, 2009). There is limited research on the impact of sexual education received in adolescence on sexual attitudes and satisfaction in early adulthood.

GOAL OF THE PRESENT STUDY AND HYPOTHESES

The goal of the current study was to explore the relationships between potential sources of knowledge and values from early life (i.e., parental socialization and school-based sexual education during adolescence) on young adults' sexual attitudes, beliefs, and enjoyment of their sexual experiences. Specifically, we investigated young adults' perceptions of the content and quality of their school-based sex education, parental sexual socialization, sexual self-efficacy, sexual attitudes, and sexual satisfaction. For the purposes of the study, we defined permissiveness (in socialization and attitudes) as comfort with and acceptance of exploration of sexuality, including across types of sexual relationships (e.g., non-marital, casual, long-term) and levels of emotional attachment.

Based on the extant literature, we first examined whether there were direct relationships between parental or academic sexual health education on sexual attitudes, sexual self-efficacy, and sexual satisfaction. We hypothesized that exposure to higher-quality, more comprehensive sexual education and socialization by parents that was more accepting (permissive) of sexuality would be related to more permissive sexual attitudes and greater sexual self-efficacy but not to sexual satisfaction. Next, we explored whether sexual attitudes and self-efficacy had direct effects on sexual satisfaction, hypothesizing that positive relationships would be found. Although not central to our hypothesis, gender was included as a covariate in our analyses given the previously demonstrated gender differences in socialization,

attitudes, and satisfaction. Similarly, relationship status was included due to its previously demonstrated effects on sexual satisfaction (Peter & Valkenburg, 2009).

We based our reasoning for the study in part on Roger's (2017) conclusions that sexual attitudes and self-efficacy are mechanisms through which parental communication about sex has an influence on sexual intentions and behavior, and we expected that sex education impacts could be similarly mediated. When conceptualizing the role of sexual education in sexual development, it could be argued that exposure to comprehensive sexual health information (sex education) within an accepting environment (parental sexual socialization) would promote the strategies and skills necessary to engage in healthy and safe sexual activity. Theoretically, if young adults learn these skills, they will feel more confident in their ability to enact them (sexual self-efficacy). Thus, the more comfortable young adults feel (sexual attitudes) when they engage in sexual activity, the more likely they will find these activities enjoyable (sexual satisfaction). We, therefore, concluded our investigation by exploring the possible mediating role of sexual attitudes and sexual self-efficacy on the relationship between sex education and socialization and sexual satisfaction. We hypothesized that permissive sexual attitudes and higher self-efficacy would mediate the impact of parental socialization and sex education on sexual satisfaction. To the authors' knowledge, no studies have investigated this combination of variables in a diverse Canadian sample.

METHOD

Participants

Ninety-nine students, with an average age of 20 years ($SD = 1.75$), completed an online survey and received .5 bonus points toward a psychology course. Fifty-six (56.6%) participants identified as women, 42 (42.4%) identified as men, and one person identified as transgender (1.0%). The sample was diverse in terms of racial/ethnic identification, with 65.6% identified as White/Canadian/European, 12.1% as Middle Eastern, 8.2% as Black/African/Caribbean, 7.1% as South Asian, 5.0% as East Asian, and 2.0% as Indigenous/First Nations. Most participants identified as heterosexual (84.7%), 5.1% as bisexual, 4.0% as lesbian/gay, 2.0% as

pansexual, 1.0% as asexual, and 3.0% responded that they were not sure. The sample was generally romantically and sexually inexperienced. Just over one-third of the participants ($n = 39$) were currently in a romantic (39.8%) or sexual relationship (39.4%). Thirty-nine percent of the sample ($n = 39$) reported never having a sexual partner and 29.3% ($n = 29$) reported only one partner since becoming sexually active.

Procedure

Following clearance from the Research Ethics Board, undergraduate students were recruited through the university's psychology participant pool. Students between 17 and 25 years of age who had previous exposure to school-based sexual education (i.e., not homeschooled) were eligible to participate in the study. Sexual experience was not required. Eligible participants completed a demographic questionnaire followed by the Sexuality Education Program Feature/Program Outcome Inventory (Klein, 1998), a modified Brief Sexual Attitude Scale (Hendrick et al., 2006), the Sexual Health Practices Self-Efficacy Scale (Koch et al., 2013), and the Global Measure of Sexual Satisfaction (GMSEX; Lawrence et al., 2011). All measures were administered through Qualtrics, an online survey platform.

Measures

The internal consistency, means, and standard deviations for each of the measures used are presented in Table 1. A brief description of each measure is given below.

Demographics

The demographic questionnaire included questions about age, gender, academic year, sexual identity, and race/ethnicity. Participants were asked two (yes = 1 / no = 0) questions regarding their relationship status: 1) were they currently involved in a romantic relationship? and 2) were they currently involved in a sexual relationship? They were asked how many sexual partners they had had since becoming sexually active and were told to enter zero if they had not yet been sexually active. Participants were also asked if they received any education about human sexuality in school (grades 1–12) and how that education was delivered (e.g., through a stand-alone course, part of another course, or presented by an external speaker).

TABLE 1. Descriptive Statistics and Reliability of Scales and Subscales

Scale/Subscale	<i>n</i>	<i>M</i>	<i>SD</i>	Min.	Max	α
Program Characteristics (SEPF/PO)	99	25.73	9.59	0.00	48.00	.83
Curriculum Topics (SEPF/PO)	99	28.67	10.01	8.00	48.00	.90
Parental Sexual Socialization Scale	99	23.59	7.37	11.00	44.00	.77
Self-Efficacy (SHP)	99	67.74	16.56	20.00	100.00	.94
Permissiveness (BSAS)	99	27.49	8.71	10.00	45.00	.89
Instrumentality (BSAS)	99	14.73	3.71	5.00	25.00	.71
Global Measure of Sexual Satisfaction	97	25.59	6.48	5.00	35.00	.93

Note. SEPF/PO = Sexual Education Program Feature/Program Outcome; SHP = Sexual Health Practices Self-Efficacy Scale; BSAS = Brief Sexual Attitudes Scale.

Sexual Education

The Sexuality Education Program Feature/Program Outcome Inventory (Klein, 1998) is designed to assess the quality and impact of sexual education on students. It features 69 items and six sub-scales: (a) Program Characteristics, (b) Changes in Knowledge, (c) Understanding of Self, (d) Changes in Values, (e) Changes in Interaction Skills, and (f) Curriculum Topics. All subscales were administered to maintain survey integrity; however, only the Program Characteristics (12 items) and Curriculum Topics (23 items) subscales were included in the analysis. The Program Characteristics subscale evaluates the quality of the programming delivery (e.g., if the teacher was comfortable discussing topics, encouraged questions, etc.). These items were scored on a modified 5-point Likert-type scale, with responses ranging from 0 = don't know, 1 = strongly disagree to 4 = strongly agree. Higher scores represent greater quality. The Curriculum Topics subscale measures the comprehensiveness of sexual health topics covered (e.g., communication, birth control, and physiology). These items were rated on an ordinal scale with 4 response options, including 0 = not at all, 1 = informally taught, 2 = formally taught (3 = don't know, which was recoded as 0). Scores were summed with higher scores indicating greater comprehensiveness. In past research, subscales demonstrated acceptable to high internal consistency (Klein, 1984; Cronbach's alphas $\geq .79$).

Parental Sexual Socialization

A modified Parental Sexual Socialization Scale (Lottes & Kuriloff, 1998) was used to assess parental attitudes towards young adults' engagement in non-marital sexual activity. Permissive socialization in the original scale reflects acceptance of involvement in various sexual relationships (e.g., casual to long-term). In contrast, more conservative socialization reflects disapproval of casual sexual relationships and encourages abstinence or sex exclusively within the confines of marriage/a long-term relationship. The original measure features 8 items. Examples of items include "My mother would only have approved of me having sex in a serious relationship" and "My parents would disapprove of my being sexually active". Two items developed by the third author and used productively in the past were added ("My parents talked freely about sex with me," "My parents were comfortable talking about sex with me"). These items correlate highly with other items and extend the construct of permissiveness to include comfort with communicating about sexuality. Participants were asked to rate how much they agreed with the 10 statements using a 5-point Likert scale, ranging from 1 = strongly agree, to 5 = strongly disagree. Higher scores indicate more permissive or accepting sexual socialization. The original scale demonstrated acceptable reliability ($\alpha = .73$; Lottes & Kuriloff, 1998).

Sexual Attitudes

The Brief Sexual Attitude Scale (Hendrick et al., 2006) is a shortened version of the original 58-item measure (Hendrick & Hendrick, 1987). Participants rate 23 items related to attitudes about sex on a Likert-scale ranging from 1 = strongly agree, to 5 = strongly disagree, with higher scores indicating more

permissive attitudes. The scale can be divided into four subscales: Permissiveness, Birth Control, Communion, and Instrumentality. For the purposes of this study, only the Permissiveness (10 items) and Instrumentality (5 items) subscales were of interest. Permissiveness represents a more casual, accepting attitude about sex. Instrumentality reflects the belief that sex is a natural and important part of life. Reliability coefficients in the original research (Hendrick et al., 2006) were good: Permissiveness ($\alpha = .93$) and Instrumentality ($\alpha = .77$).

Sexual Self-Efficacy

The Sexual Health Practices Self-Efficacy Scale (Koch et al., 2013) features 20 items used to assess respondents' confidence engaging in various sexual health practices (e.g., using condoms, seeking sexually transmitted infections testing). Scale items can be divided into six subscales: (1) sexual relationships, (2) sexual health care, (3) sexual assault, (4) safer sex, (5) sexual equality, and (6) abstinence. For the purposes of the study, only the total score was used. Participants rated their confidence on a five-point Likert scale, with responses ranging from 1 = not at all confident, to 5 = extremely confident. Higher scores represent higher confidence. Koch (2009) demonstrated good reliability for the overall scale ($\alpha = .89$). This measure has been shown to have good face and content validity (Koch, 2009).

Sexual Satisfaction

The Global Measure of Sexual Satisfaction (GMSEX; Lawrence et al., 2011) evaluates participants' overall satisfaction with their sexual relationships (broadly defined, it asks, "*In general, how would you describe your sexual relationships? By sexual relationships we do not only mean relationships that involved sexual intercourse, but all relationships that involved any level of sexual activity with a partner (e.g., hugging, kissing, sexual touching, sexual intercourse)*". Participants rated their satisfaction on a seven-point scale anchored by five semantically opposed adjective-pairs (e.g., very bad/very good, very unpleasant/very pleasant, very negative/very positive). Higher scores indicated greater satisfaction. The GMSEX has demonstrated high internal consistency ($\alpha \geq .90$), convergent validity, and test-retest reliability (Lawrence et al., 2011; Mark et al., 2014).

RESULTS

Sexual Education Experience

Most participants (91.8%) reported receiving some form of sex education in school (grade 1–12), 8% could not recall any sexual topics being covered. Almost three-quarters of participants (73.7%) reported receiving sexual education as part of another class (e.g., biology, health, religion), while 14.1% attended a stand-alone sexual education course. Nineteen percent reported that sexual education was presented by an external speaker outside of regular class time.

Roughly half of participants (54.6%) felt that teachers were comfortable discussing sexuality in class, and 53.6% reported

TABLE 2. Correlations Between Variables of Interest

Variable	1	2	3	4	5	6	7	8	9
1. Parental Sexual Socialization	–								
2. Program Characteristics	-.01	–							
3. Curriculum Topics	.22*	.43**	–						
4. Sexual Self-efficacy	.03	.29**	.25*	–					
5. Permissive Attitudes	.33**	.15	.12	.06	–				
6. Instrumentality Attitudes	.11	.19	.13	.04	.19	–			
7. Sexual Satisfaction	.19	.07	.11	.39**	.24*	.08	–		

* $p < .05$. ** $p < .01$

that their teacher discussed topics in a way that created a comfortable and positive environment. Less than half of participants reported having enthusiastic teachers (42.5%), being encouraged to ask questions (44.5%), or express their opinions (35.4%) or values about sexuality (42.4%). The most common topics formally covered in sex education included biology and anatomy (83.8%), sexually transmitted diseases (80.8%), adolescent pregnancy (62.2%), and contraception-related topics (56.6%). Less than half of participants reported formal coverage of topics relating to communication (42.4%), problem solving (34.3%), and common myths about sexuality (35.7%). Overall, topics involving emotional (26.3%) and interpersonal (21.2%) aspects of sexuality were least likely to be formally covered.

Preliminary Analyses

Bivariate correlation analyses were conducted for all variables of interest (see Table 2). Results indicated that parental sexual socialization was positively associated with permissive attitudes. Those currently in relationships described their sex education as more comprehensive (curriculum topics) and conveyed with more teacher comfort (program characteristics) than did other young adults. Sexual self-efficacy was significantly positively associated with curriculum topics (comprehensiveness), program characteristics (quality), and sexual satisfaction.

Main Analyses of Direct and Indirect Effects

To establish whether it was necessary to include gender and sexual relationship status in the next steps of the analysis, independent samples t-tests were conducted to test for group differences on the outcome variables. Results indicated significant gender differences on permissive sexual attitudes, $t(95) = 2.08$, $p = .041$, and sexual satisfaction, $t(94) = 2.66$, $p = .009$. Men endorsed more permissive sexual attitudes ($M = 29.6$, $SD = 9.3$) than women ($M = 23.9$, $SD = 6.5$), as well as higher levels of sexual satisfaction ($M = 27.4$, $SD = 6.0$) compared to women ($M = 25.9$, $SD = 8.0$). There was also a significant difference in sexual satisfaction based on sexual relationship status, $t(95) = 4.66$, $p < .001$. Participants who reported being in a current sexual relationship reported greater overall sexual satisfaction ($M = 28.8$, $SD = 5.58$) compared to those not in a relationship ($M = 23.1$, $SD = 5.8$).

Table 3. Hierarchical Regression Analyses Examining the Effect of Family and School-Based Sexual Education on Permissive Sexual Attitudes (Permissiveness)

Model	B	SE	β	η	R^2	ΔR^2
Step 1:					.04	.04*
Constant	29.56	1.33				
Gender	-3.63*	1.75	-2.07	-0.21		
Step 2:					.13	.09*
Constant	17.23	4.28				
Gender	-1.80	1.82	-0.10	-0.10		
Parental socialization	0.34*	0.13	0.29	0.27		
Program Characteristics	0.13	0.10	0.15	0.14		
Curriculum Topics	-0.01	0.10	-0.01	-0.01		

Note. $N = 95$.

* $p < .05$.

To test hypotheses related to the direct effects of sexual education (Program Characteristics and Curriculum Topics) and parental sexual socialization on sexual attitudes (permissive, instrumental), sexual self-efficacy, and sexual satisfaction as outcomes, four regressions were conducted. Gender and relationship status were only considered in analyses where they were related to outcomes and were entered in the first step (covaried). In this way, we focused on assessing relationships between sex education and parental socialization and the outcomes, beyond these known influences.

The first (hierarchical) regression model was significant, $F(3, 93) = 3.27$, $p = .025$, $R^2 = .13$, indicating that gender, sex education, and socialization accounted for 13% of the variance in permissive sexual attitudes. When controlling for gender, only parental sexual socialization uniquely predicted permissive sexual attitudes in young adulthood with parental socialization messages that were more accepting of teens' sexuality associated with more permissive current sexual attitudes. See Table 3 for more detail. The second regression model was not significant, $F(3, 95) = 1.61$, $p = .192$, indicating that family and school-based sexual education did not predict instrumental sexual attitudes. Specifically, parental socialization, $\beta = .10$, $t(95) = 0.99$, $p = .326$,

TABLE 4. Hierarchical Regression Analyses Examining the Effect of Parental Sexual Socialization and Sexual Education on Sexual Satisfaction

Model	B	SE	β	η	R^2	ΔR^2
Step 1:					.23	.23***
Constant	24.88	1.06				
Gender	-2.79*	1.19	-0.21	-0.24		
Sexual Relationship Status	5.30***	1.21	0.40	0.41		
Step 2:					.28	.05
Constant	18.46	3.16				
Gender	-2.41	1.26	-0.18	-0.20		
Sexual Relationship Status	6.14***	1.25	0.46	0.46		
Parental socialization	0.04	0.09	0.05	0.05		
Program Characteristics	0.09	0.07	0.13	0.14		
Curriculum Topics	0.09	0.07	0.14	0.14		

Note. N = 96. Gender: 0 = man, 1 = woman; Sexual relationship status: 0 = not in a sexual relationship, 1 = in a sexual relationship; B = unstandardized beta.

*p < .05. **p < .01. ***p < .001.

TABLE 5. Hierarchical Regression Analyses Examining the Effect of Self-Efficacy and Sexual Attitudes on Sexual Satisfaction

Model	B	SE	β	η	R^2	ΔR^2
Step 1:					.23	.23***
Constant	25.05	1.08				
Gender	-2.93*	1.21	-0.22	-0.25		
Sexual Relationship Status	5.20***	1.22	0.39	0.41		
Step 2:					.39	.16***
Constant	10.00	3.61				
Gender	-2.01	1.12	-0.15	-0.19		
Sexual Relationship Status	4.92***	1.11	0.37	0.43		
Permissiveness (BSAS)	0.10	0.07	0.14	0.17		
Instrumentality (BSAS)	0.15	0.15	0.08	0.10		
Self-efficacy	0.14***	0.03	0.36	0.42		

Note. N = 95. Gender: 0 = man, 1 = woman; Sexual relationship status: 0 = not in a sexual relationship, 1 = in a sexual relationship; BSAS: Brief Sexual Attitude Scale; B = unstandardized beta.

*p < .05. **p < .01. ***p < .001.

program characteristics $\beta = .18$, $t(95) = 1.61$, $p = .110$, and curriculum topics, $\beta = .03$, $t(95) = 0.23$, $p = .815$, did not predict sexual attitudes.

The third regression model was significant, $F(3, 95) = 3.7$, $p = .014$, explaining 11% of the variance in sexual self-efficacy. Only program characteristics (quality of sex education) significantly predicted participants' sexual self-efficacy, $\beta = .23$, $t(95) = 2.12$, $p = .037$, with higher school-based sex education quality related to higher sexual confidence. Parental socialization, $\beta = -.00$, $t(95) = -.03$, $p = .978$, and curriculum topics (comprehensiveness), $\beta = .15$, $t(95) = 1.36$, $p = .175$, did not predict sexual self-efficacy.

In the fourth (hierarchical) regression model, which tested the direct effects of sexual socialization and sex education on sexual satisfaction, gender and sexual relationship status (entered in Step 1) explained 23% of the variance in sexual satisfaction,

$F(2, 93) = 13.84$, $p < .001$, $R^2 = .23$. Step 2 was not significant, $F(3, 90) = 2.11$, $p = .104$, showing that parental socialization and school-based sexual education did not directly contribute to prediction of sexual satisfaction when gender and sexual relationship status were controlled. See Table 4 for more detail.

Next, using another hierarchical regression, we tested the hypothesis that sexual attitudes (permissive and instrumental) and self-efficacy would contribute to the prediction of sexual satisfaction beyond the role of gender and sexual relationship status. See Table 5. The full model (attitudes, self-efficacy, gender, and relationship status) was significant and accounted for 39% of the variance in sexual satisfaction, $F(3, 89) = 7.799$, $p < .001$. In the final model, after controlling for gender and sexual relationship status, only sexual self-efficacy significantly and uniquely improved prediction of sexual satisfaction. As expected, higher sexual self-confidence was related to higher sexual satisfaction.

The previous regression analyses indicated that there was no direct relationship between parental socialization, school-based sex education, and sexual satisfaction; however, we had hypothesized that these effects could be indirect through sexual attitudes and sexual self-efficacy. Given that sexual attitudes (permissiveness and instrumentality) did not contribute to the prediction of sexual satisfaction when gender and sexual relationship status were controlled in the previous analyses, there was no need to assess their role as mediators. Thus, three mediation analyses were conducted to explore the role of sexual self-efficacy in the relation between each of the parental socialization and sex education (program characteristics and curriculum topics) factors and sexual satisfaction, while controlling for gender and relationship status. Preacher and Hayes' (2004) method using the PROCESS macro was implemented and the sampling distribution was bootstrapped to 5000 (the default setting). Kenny's causal steps approach was not used, as there is growing criticism of the method (for a comprehensive review, see Memon et al., 2018; Rucker et al., 2011).

The analyses revealed that sexual self-efficacy mediated the relationship between both program characteristics (sex education quality), $B = .07$, $SE = .03$, 95% CI [0.02, 0.14] and curriculum topics (sex education comprehensiveness), $B = .05$, $SE = .03$, 95% CI [0.01, 0.12] and sexual satisfaction. See Figure 1 for a depiction of the first of these analyses. The unstandardized regression coefficients between program characteristics and sexual self-efficacy and between sexual self-efficacy and sexual satisfaction were significant. The direct effect of program characteristics (quality) on sexual satisfaction was not significant. The same pattern was demonstrated for curriculum topics (comprehensiveness) —the a and b paths were significant, but the direct path was not. Both mediation models explained 35% of the variance

in sexual satisfaction. By contrast, the models without the mediation effect accounted for only 26% and 27% of the variance, respectively. It should be noted that the significant influence of sex education comprehensiveness on sexual self-efficacy and through it to sexual satisfaction was evident despite the null findings related to the direct effect between comprehensiveness and self-efficacy in an earlier regression analysis. The earlier analysis did not control for gender and relationship status because there was no significant difference between groups on self-efficacy. We, therefore, interpret only this final more important mediation analysis in the discussion. Although the overall mediation model was significant, $F(4, 91) = 12.25$, $p < .001$, $R^2 = .35$, parental socialization did not significantly predict sexual satisfaction, $\beta = .09$, $t(91) = .97$, $p = .334$, and there was no indirect effect of parental socialization through self-efficacy, $B = -.01$, $SE = .04$, 95% CI [-0.10, 0.06].

DISCUSSION

The current study's findings replicate, qualify, and build on previous research in the field. We had hypothesized that young adults' reports of parents providing more accepting (permissive) messages about their sexuality and greater comprehensiveness and quality of school-based sex education would be related to their more positive, permissive, and autonomous current attitudes and greater sexual self-confidence. We postulated that these attitudes and beliefs would then be associated with greater sexual satisfaction. We specifically hypothesized that the influences of parental socialization and sexual education on sexual satisfaction in young adulthood would be mediated by current sexual attitudes and self-confidence. We controlled for gender and relationship status, both of which have been associated with sexual attitudes and beliefs (Pedersen & Blekesaune, 2003; Petersen & Hyde, 2011) but were not the focus of the current study. Our hypotheses were partially supported.

In terms of direct influences, based on retrospective reports, sexual socialization by parents that was more accepting of children's sexuality and sexual behaviour (i.e., more permissive) was related to more permissive (but not instrumental) current sexual attitudes, sexual self-efficacy, and sexual satisfaction when gender, being in a sexual relationship, and school-based sex education were taken into account. Neither the comprehensiveness nor the quality of school-based sex education influenced current sexual attitudes when parents' messages about sex were accounted for. As expected, sexual education (whether family or school based) did not directly predict sexual satisfaction when controlling for sexual relationship status. Only sexual relationship status and sexual self-efficacy played a unique role in predicting young adults' sexual satisfaction in these analyses.

However, this was not the end of our exploration. Greater sexual self-efficacy has been hypothesized to help youth navigate sexual situations, also increasing the likelihood they will enjoy their sexual encounters (Schalet, 2011). As hypothesized, sexual self-efficacy mediated the relationship between sexual education and sexual satisfaction. In other words, higher quality and more comprehensive sexual education predicted greater self-efficacy,

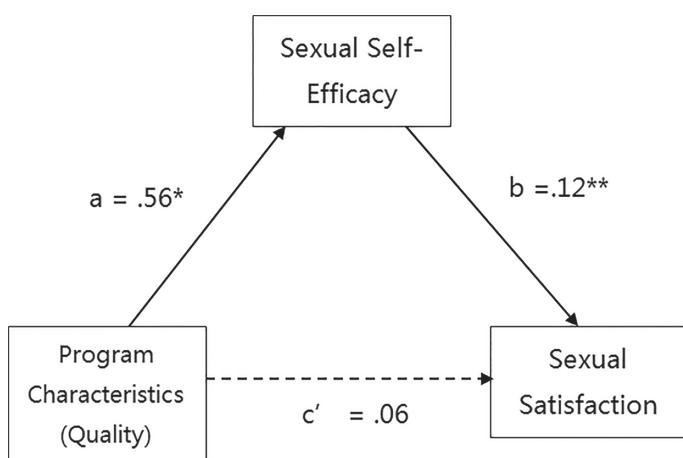


FIGURE 1. Mediation analysis of the indirect effect of sex education quality on sexual satisfaction through sexual self-efficacy (with gender and current sexual relationship status controlled). Note. Statistics are unstandardized regression coefficients. Dotted lines represent nonsignificant relations.

* $p < .05$, ** $p < .001$

and higher sexual confidence was then related to higher levels of sexual satisfaction.

Young adults' sexual self-efficacy was affected both by the specific content of school-based sexual education and by how that content is delivered (e.g., if the environment is accepting and teachers are comfortable discussing topics). The two sex-education scores, rating the comprehensiveness of topics covered, and the quality of the education environment the teachers created were correlated as one would expect. When they were included in statistical analyses together, quality trumped comprehensiveness across the board. However, each was influential and affected a large proportion of the variance in sexual self-efficacy, and through it had an impact on sexual satisfaction when examined alone. One possible explanation for these findings is that an accepting teaching environment maximizes student's receptivity to sexual health information at the time and in the future and, therefore, matters as much or more than the content provided. This notion is supported by Schalet's (2011) theory that conveying acceptance of teen sexuality encourages youth to ask questions and seek guidance when needed, thereby increasing the opportunity for knowledge acquisition. As a result, teens may gain insight into their own sexual desires and boundaries, which would in turn enhance their sexual self-efficacy. Moreover, extending Schalet's (2011) suggestion, good sexual education seems to indirectly increase sexual enjoyment (later in life) by helping teenagers develop the confidence to carry out positive sexual health behaviours. Teachers need to be better supported to facilitate their ability to do this work (Cohen et al., 2004) and have these impacts.

One would expect parental acceptance of sexuality to have the same relationship with self-efficacy and sexual satisfaction, but it did not. Examination of the scale means for the current sample provides a possible explanation. The average score is a 2 (disagree) on the 5-point scale and represents a non-permissive, conservative parental standpoint. While there was variability in responses, it may be that there were insufficient numbers of young adults in this sample whose parents were comfortable talking about sex and accepting of their sexual behaviour outside of marital relationships to adequately test the relationship (i.e., a floor effect). Past research demonstrates that many parents experience discomfort with these conversations and topics despite feeling obligated to have them with their teens (e.g., Malacane & Beckmeyer, 2016; Widman et al., 2016). Future research should explore the differential impact of acceptance of teen sexuality as conveyed by parents and teachers on self-efficacy in a larger sample representing experience with more variation in parental messaging.

While it was not the focus of the current study, consistent with previous research (Peter & Valkenburg, 2009), being in a sexual relationship was associated with greater sexual satisfaction and this relationship remained a unique predictor even when other factors were controlled. Past research suggested that sexual experience is an important influence (or moderator) of sexual satisfaction (e.g., Peter & Valkenburg, 2009). This sample of young university students were mostly sexually inexperienced and not in current relationships, which likely reflects the

relatively recent historical shift towards delayed sexual activity (Ethier et al., 2018; Finer & Philbin, 2014). However, since the sexual satisfaction measure used captures satisfaction with a range of intimate sexual activities including kissing and hugging, the influence of relationship status is likely not simply a matter of inexperience or dissatisfaction with not having a sexual relationship. This is supported by interpretation of the average scores, which show an average near 5 on the 7-point scale, a full point above the mid-point for those not in a relationship and not quite 1 point higher for those in them. Given that there was no relationship found between relationship status and self-efficacy, sexual self-efficacy remains an important, large, and independent contributor to sexual satisfaction in young adulthood.

Based on decades of past research, we expected gender differences to be present in the messages received and held (Evans, Widman, Kamke, et al., 2020; Tolman, 2002), and sexual satisfaction. Our findings replicated past findings with women reporting less permissive attitudes and lower satisfaction with their sexual lives than men. However, gender did not remain a significant predictor of sexual attitudes when parental sexual socialization (which differed by gender) was taken into account, nor was it important when other important predictors of sexual satisfaction (relationship status and self-efficacy) were included in the analyses.

The contested Ontario elementary school sex education curriculum (grades 1–8; Ministry of Education, Ontario, 2015, 2019) has only been in use for a few years (2015–2018, 2019+), and the changes made may take time to be implemented and visible in young adults' knowledge. Young adults' reports of their school-based sexual education demonstrate that (at least in Ontario for those 25 years and younger) the curriculum and approach still focus largely on negative health outcomes, contraceptive use, and anatomy and physiology. Social and emotion-related topics were less likely to be formally covered in sexual education programming. This is unfortunate as this type of information helps teens counteract messages commonly found in widely available sexually explicit materials (i.e., pornography, e.g., Bridges et al., 2010) and develop skills to better navigate sexual situations and negotiate sexual desires, boundaries, and safer sex (e.g., Fine & McClelland, 2006; Schalet, 2011). Coverage of these topics in a safe and accepting instructional environment could build self-efficacy, giving adolescents the confidence to go at their own pace and avoid being swayed by social pressures. These skills are important to the development of satisfying sexual relationships in emerging adulthood and beyond.

STRENGTHS AND LIMITATIONS

Any retrospective study is subject to recall bias. In the current study, recall bias likely influenced the key variables related to parents' sexual messaging and school-based sexual education. Replication of our findings in a larger prospective study would address this concern. Another limitation related to parents' socialization of adolescents is our use of a single measure. We did not collect additional information about the quality of parental sexual communications or on the specific sexual information

conveyed. Inclusion of these additional details would have provided us with more tools to untangle the relationship between sexual knowledge, sexual socialization, and current sexual experiences and attitudes.

The current study was conducted on a university campus in a diverse Canadian city. While there are limitations to convenience samples of university students, in this case, this is mitigated by the sample's diversity. We did not restrict participation to those students who had relationship experience and just over one-third of the young adults were currently in a relationship. More than one-third of the sample consisted of racialized students and 15% reported their sexual identity as lesbian, gay, bisexual, asexual, pansexual, or not sure. This suggests that findings based on this sample are likely more generalizable than is usual in the field where samples are made up mostly of White, heterosexual students (Byers, 2011).

Our analysis of both direct and indirect effects of socialization and sex education strengthened this study's contribution to the field. However, replication of our mediation analyses is warranted given that the sample size was sufficient to detect only medium to large effects (Faul et al., 2009). The impact of sex education and parental socialization is likely more evident in young adulthood than later in life, which makes our deliberate focus on young adults under 26 a strength. It may be beneficial to conduct longitudinal investigations of the longer lasting reverberations of adolescent sex education and parental messaging on self-efficacy for sexual satisfaction as more relationship experience is gained with age and changes in social contexts.

CONCLUSION

As Byers (2011) eloquently stated, "Sexual experience and expression is of fundamental importance to most people" (p. 20). Sexual experiences and sexual communication are shaped by the messages we are exposed to in our youth. The influence of the sexual education and socialization we receive from both our parents and in school is apparent and complimentary. School-based sexual education, if provided in a context and by teachers who are comfortable with the topic and accepting of teen sexuality, has several benefits in relation to young adults' sexual attitudes and beliefs. Not only does the current study corroborate the relationship between sexual education and sexual attitudes in emerging adulthood, but it also provides insights into the mechanism by which sexual education may influence sexual satisfaction. While tentative until replicated prospectively, our findings suggest that sexual education received in adolescence may increase sexual self-efficacy, which in turn, may increase sexual satisfaction. Our findings also support prioritizing teacher training to increase their comfort with the subject matter and improve their delivery of sexual education content.

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