

Article

# Talk about It, Don't Type about It: How In-Person and Technology-Mediated Sexual Self-Disclosure Relate to Sexual Satisfaction

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**Abstract:** Sexual self-disclosure (SSD) is when a person shares information about their sexuality with another person. Technology-mediated communication is pervasive in modern society, yet researchers have not distinguished between SSDs that occur in-person versus in technology-mediated contexts. Using the Interpersonal Exchange Model of Sexual Satisfaction, researchers previously found that SSD predicts sexual rewards, costs, and satisfaction. In this study, we (1) compared cisgender/transgender men's and women's frequency (how much) and breadth (how many topics) of SSD via typed technology and in-person (H1, H2), and (2) examined the extent to which the frequency and breadth of SSD in each context predicted perceived sexual rewards, comparison of sexual rewards, and in turn sexual satisfaction while controlling for relationship satisfaction (H3, H4, H5, H6). Undergraduate students ( $N = 450$ ) completed an online survey that assessed SSD in each context, perceived sexual rewards and costs, comparison of own and partner's sexual rewards and costs, and sexual and relationship satisfaction. Participants reported more frequent and greater breadth of SSD in-person than via technology. We also found that women disclosed more sexual topics than men in-person but not through typed technology. Using path analyses, a greater frequency of SSD in-person predicted greater perceived sexual rewards and comparison sexual rewards, and in turn, greater sexual satisfaction. The frequency of SSD via typed technology and the SSD breadth in either context did not predict exchanges or sexual satisfaction.

**Keywords:** sexual self-disclosure; sexual communication; sexual satisfaction; technology-mediated communication; interpersonal exchange model



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## 1. Introduction

Sexual self-disclosure (SSD) is the component of sexual communication that involves willingly sharing information about one's own sexuality, preferences, attitudes, and experiences [1]. When SSD is connected to the Interpersonal Exchange Model of Satisfaction (IEMSS) [2], greater SSD to a sexual partner(s) leads to greater sexual rewards (i.e., any pleasing exchange with a partner) and fewer sexual costs (i.e., any demanding or discomforting exchange), which in turn leads to greater sexual satisfaction [3–6]. However, researchers have not examined this pathway within other contexts. In particular, researchers have yet to evaluate technology-mediated SSD to understand how this context compares to in-person SSD. Yet, people—especially young adults—have increasingly adopted technologies for interpersonal communication [7–9]. Additionally, some research suggests that men and women differ in their self-disclosures generally, and in SSD specifically (e.g., [4,5]). Yet, only a few researchers have examined how gender differences in SSD may prompt differences in sexual rewards, costs, and satisfaction [4–6,10]. The goal of this study was to contribute to research on SSD and the IEMSS by examining the extent to which cisgender/transgender (cis/trans; we grouped any participant identifying as a cisgender or transgender man together and we grouped any participant identifying as a cisgender or transgender woman

together) women's and cis/trans men's in-person and typed-technology SSD differed in frequency and breadth and contributed to sexual rewards, costs, and in turn satisfaction.

### 1.1. Sexual Self-Disclosure

Frequency and breadth of SSD are the best ways to capture how people in all kinds of sexual relationship configurations sexually self-disclose. SSD is a specific type of self-disclosure that people use in their sexual or romantic relationships to share personal information about the sexual aspects of themselves with others. SSD is measured in terms of the amount of information disclosed (frequency), how many different topics are disclosed (breadth), and how intimate or sensitive each topic is (depth) [11]. Social Penetration Theory (SPT) [3,12] explains how communication evolves in interpersonal relationships over time and supports the notion that SSD depth and breadth increase as relationships are maintained over time. However, people also make SSDs in new, short, or less intimate sexual relationships with the intention of gaining sexual rewards (e.g., [3]). Short-term or non-committal sexual relationships likely differ in terms of the intimacy of disclosure compared to long-term, committed relationships [12,13]. As such, we measured the frequency and breadth of SSDs while holding the depth constant to better understand the role of SSD and its impact on relationship and sexual satisfaction in various sexual relationship configurations.

In the realm of technology-mediated communication, SSD is likely prevalent. People—especially young adults—use many technologies as alternatives for maintaining close contact and support when in-person communication is unavailable [9]. For instance, young adults may use dating apps to converse about sexual preferences in search of compatible partners, while couples may engage in text-based discussions about their sexual needs [14,15]. Typed technology refers to one type of technology-mediated communication, where people use words and symbols within text-based applications to communicate with others. Text-based communication includes but is not limited to email, instant messaging, and SMS messages. Typed technologies are characterized by different degrees of uptake for different forms of communication. Yet, in prior SSD research, the spatial context of disclosures has been omitted. Researchers have found that some people, particularly young adults, report engaging in technology-mediated communications and online sexual activities with current, past, and desired sexual partners [16–20]. Although these interactions presumably encompass SSD, the previous research did not explicitly address it. Kafeae and Kohut [14] found that sexting and SSD within technology-mediated contexts were prevalent in young adults' romantic relationships; these seemed to be particularly beneficial for those in long-distance relationships.

Technology-mediated communication provides users with contextual conditions that are not readily available in in-person communication. This is especially true for typed communications. These conditions include anonymity and asynchronicity [21–23]. Anonymity fosters honest self-disclosure due to decreased public awareness [21,24,25], and asynchronicity reduces accountability, potentially leading to disinhibited behaviors online [24,26]. Research indicates that people of all ages are more willing to self-disclose sensitive topics through typed technology because it offers a perceived disconnect from real-world consequences and grants a sense of security and comfort [21,24,25,27–29]. In sum, previous research suggests that typed-technology communication affords young adults characteristics that are not available in-person. These affordances may prompt young adults to turn to typed technology for SSD. At the same time, previous research also suggests that people tend to engage in SSD in-person at one's residence because this context is perceived as secure [30]. As communication modes evolve, research on SSD must remain current to grasp the role of technology in people's sexual lives. Furthermore, ongoing investigations will allow researchers to better understand how often technology is used for SSD compared to in-person, and whether using technology to sexually self-disclose is beneficial for people's sexual relationships. Based on theory and past research, we posed the following:

**Research Question 1 (RQ1).** *How often (frequency) and how many different sexual topics (breadth) do young adults sexually self-disclose via typed technology?*

**Hypothesis 1 (H1).** *Young adults make SSDs via typed technology more frequently and with greater breadth than in-person SSDs.*

### 1.2. Gender Differences in Sexual Self-Disclosure

Women and men likely differ in how often they sexually self-disclose and on which topics because they are enacting gender roles and norm expectations. In all societies and cultures, there are expectations for the ways women and men are ‘supposed’ to act and contribute to interpersonal situations. These norms and roles include those that men and women typically take in communications generally, and specific to the self and sexuality. Some researchers refer to gendered norms and roles for sexual communications and behaviors as sexual scripts [31,32]. Typically, in North American culture, gender-based roles and norms emphasize women as communicators and men as inhibited in communication; these roles may be enhanced in self-disclosures [33,34]. Indeed, in a meta-analysis of 205 studies, Dindia and Allen [35] found that women self-disclose more to same-sex and opposite-sex partners than men. SSD research is similar: in most studies, women sexually self-disclose more than men [3,5,36,37]. At the same time, Sexual Script Theory suggests that men should take an active role in sexual interactions by seeking sexual stimuli and initiating sexual encounters—both of which could involve SSD (e.g., [38,39]). Hill and Stull [40] suggest that people may perceive women as sexually self-disclosing more than men because they expect women to do so. In contrast, Snell and colleagues [1] found that women were more likely than men to sexually self-disclose on topics about sexual sensations and sexual fantasies, whereas men were more likely than women to sexually self-disclose about the meaning of sex, sexual accountability, and sexual delay. Nevertheless, we expected that, for in-person SSD,

**Hypothesis 2 (H2).** *Women sexually self-disclose more frequently and across more topics than men in the in-person context.*

It is equally possible that gender norms and roles regarding SSD in in-person contexts persist or desist in typed-technology SSD. On the one hand, some research suggests that gender norms, roles, and sexual scripts persist in technology-mediated contexts such that men engage in online sexual activities more frequently than women [14,20,41–43]. These findings suggest that norms of gendered communication would also occur in typed-technology SSD such that women would sexually self-disclose with greater frequency and breadth than men. However, in the two studies in which men’s and women’s SSD was compared in-person and via technology, adolescent males self-disclosed more often than adolescent females via technology and in-person [28,44]. It is possible that the anonymity afforded by typed technologies results in a reversal of gender norms in sexual communication contexts. However, these studies were conducted in Taiwan; whether the findings would occur in Western contexts is unknown. Given these possibilities, we posed the following question:

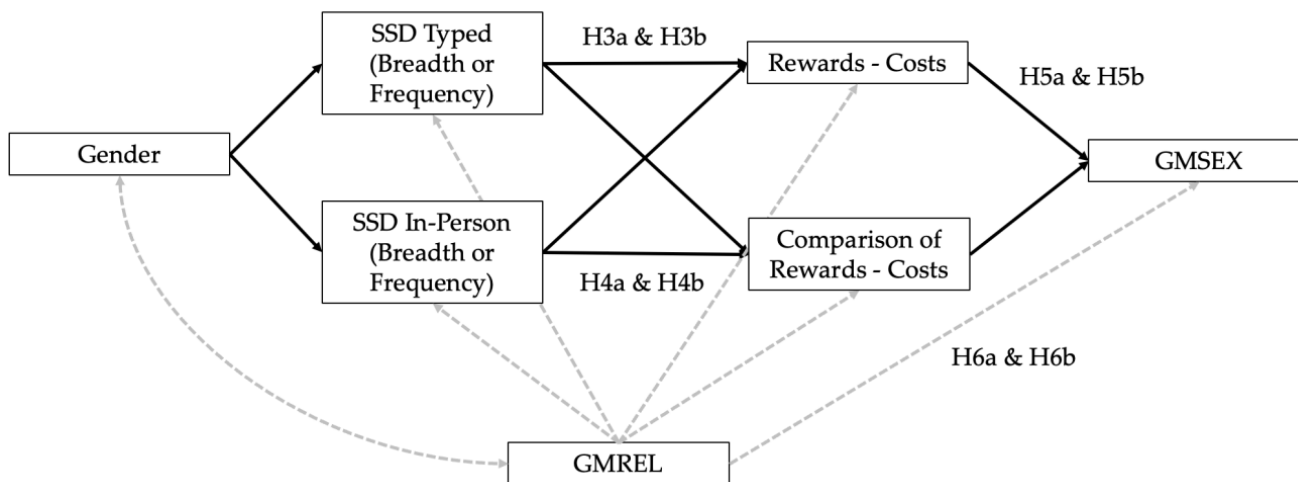
**Research Question 2 (RQ2).** *Do men and women differ in the frequency and breadth of their sexual self-disclosure via typed technology?*

### 1.3. Sexual Self-Disclosure and Sexual Satisfaction

The Interpersonal Exchange Model of Sexual Satisfaction (IEMSS) [2] may explain the ways in which SSD relates to increased sexual satisfaction. Researchers have found that a greater frequency and breadth of in-person SSD among sexual and romantic partners is associated with increased sexual satisfaction [3–6,36,37,45]. The IEMSS suggests that people’s sexual satisfaction increases when sexual partners perceive having more sexual rewards than sexual costs (REW-CST), when this balance between rewards and costs aligns with their expectations of rewards and costs (termed comparison level rewards and costs;

CLrew-CLcst), when there is greater equality between both partners’ sexual rewards and costs, and when there is greater reported relationship satisfaction [2,46–48]. Generally, when partners communicate about sexual topics often and openly, they can learn about each other’s sexual preferences, which theoretically would lead to increased sexual rewards and decreased sexual costs. These changes in sexual rewards and costs likely promote greater satisfaction with one’s sex life [6,36]. More specifically, SSD may help sexual partners build sexual relationships that are beneficial to both partners because of an increased understanding of sexual needs and preferences [5]. By communicating more openly about sexual topics, partners may also be able to better meet their own expectations of sexual rewards and costs, leading to a more favorable comparison level of their expected and perceived rewards and costs. Relationship satisfaction is independent of sexual exchanges (sexual costs and rewards) but is linked with sexual satisfaction and, therefore, is accounted for in the IEMSS [5].

SSDs made via typed technology likely are associated with increased sexual satisfaction, just as is SSD in-person. In typed-technology contexts, users have increased control over their self-presentation compared to in-person contexts (e.g., [49,50]). This increased online control allows people to determine how disclosure strategies can be used to increase certain rewards and decrease costs in interactions (e.g., [49,51]). Due to asynchronicity, people can edit and frame their message in more socially desirable ways, increasing the likelihood that a target recipient sees the sender and their disclosure more favorably [51–53]. Further, people can adopt a similar communication style to a target recipient to ensure that the conversation continues [27,54]. For all types of sexual partners, having increased control over the conversation and their appearance to the target recipient may be especially useful: it may allow people to feel safer and more confident when sharing about their sexual selves. To our knowledge, there is no research that applies the IEMSS to technology-mediated contexts or connects typed-technology SSD to sexual satisfaction. As depicted in the hypothesized model (Figure 1), we expected the following:



**Figure 1.** Hypothesized model. *Note.* Rewards—Costs = overall perceived sexual rewards, Comparison of Rewards—Costs = overall comparison sexual rewards.

**Hypotheses:** Greater SSD (i.e., frequency and breadth separately) by young adults in-person and via typed technology would relate to greater perceived sexual rewards than costs (**H3a, H3b**) and greater comparison sexual rewards than costs (**H4a, H4b**), which would both predict greater sexual satisfaction (**H5a, H5b**) and fully account for the relationship between SSD and sexual satisfaction (**H6a, H6b**) when relationship satisfaction was accounted for (controlled).

## 2. Method

### 2.1. Participants

A total of 790 participants clicked on the information and eligibility page of our survey. Of those, 786 consented to and were eligible to complete the study; however, 25 withdrew their consent and 11 indicated that we should not use their data at the end of the survey. Of the 750 eligible participants who consented and kept their data in the study, we removed an additional 295 participants during data screening. These participants were removed for completing less than 50% of the survey, responding incorrectly to more than half of the directed questions, or spending less than two seconds responding to each survey item. Finally, we only included participants who identified as a cis/trans man or cis/trans woman in line with our gender-based analyses plan (i.e., we removed participants who identified with non-binary labels), which left 450 participants for analyses.

Participants ranged in age from 18 to 43 years with an average age of 20 years ( $SD = 3.49$ ). Most participants self-identified as a cis/trans woman ( $n = 340$ , 75.6%), heterosexual ( $n = 390$ , 70.9%), single ( $n = 194$ , 93.1%), and Caucasian/White ( $n = 291$ , 62.2%). Most participants indicated that English was their first language ( $n = 292$ , 64.9%) and that they read English very well ( $n = 383$ , 85.1%). Most participants reported using a laptop ( $n = 444$ , 98.7%), smartphone ( $n = 434$ , 96.4%), and/or mobile phone ( $n = 404$ , 89.9%) to communicate with others in the last 12 months. Most participants also reported that they had been using the internet for 11–15 years ( $n = 207$ , 46%). We report additional demographic and background information in Table 1. The data are available on OSF: [https://osf.io/6xk23/?view\\_only=fb1bd70af5e84d8395cd57dd21a22b79](https://osf.io/6xk23/?view_only=fb1bd70af5e84d8395cd57dd21a22b79).

**Table 1.** Sociodemographic characteristics of participants.

Characteristic	<i>n</i>	%
Gender Identity		
Men (cisgender/transgender)	110	24.4
Women (cisgender/transgender)	340	75.6
Ethnic Origin		
Caucasian/White	283	62.9
Black	33	7.3
Biracial/Biethnic and Multiracial/Multiethnic	30	6.7
Arab	28	6.2
Chinese	27	6.0
South Asian (e.g., East Indian, Pakistani, Sri Lankan)	13	2.9
Other	33	7.4
Visible Minority		
Yes	104	23.4
No	320	71.9
Invisible Minority		
Yes	89	19.8
No	340	75.6
First Language <sup>a</sup>		
English	292	64.9
French	86	19.1
Other	67	14.9
English Reading Level		
Read very well	383	85.1
Read well	58	12.9
Other	9	2.0
Relationship Status		
Not dating or married	194	43.1
Dating but not in a committed relationship	110	24.4
Married or in a committed relationship (not living with a partner)	102	22.7
Living with a committed relationship partner (e.g., married, common law, civil union)	38	8.4

Table 1. Cont.

Characteristic	<i>n</i>	%
Sexual Orientation		
Heterosexual	319	70.9
Bisexual	71	15.8
Gay	12	2.7
Lesbian	12	2.7
Pansexual	10	2.2
Other	22	4.8
Internet Use in Years		
6–10	150	33.3
11–15	207	46.0
16–20	74	16.4
More than 20 years	12	2.7
Other	6	1.3
Technological Device Used in Last 12 Months		
Mobile phone	404	89.9
Smart phone	434	96.4
Tablet	251	55.8
E-Reader	31	6.9
Gaming system (X-box, Playstation)	198	44.0
Landline phone	212	47.1
Laptop	444	98.7
Desktop computer	277	61.6
Smart watch	95	21.1
Other	5	1.1
Sexual Partner—Partner Prompt Question		
Current sexual partner	261	58
Potential sexual partner	121	26.9
Past sexual partner	28	6.2
Someone you wished to have as a sexual partner in the past	33	7.3
Relationship Status with Sexual Partner—Partner Prompt Question <sup>b</sup>		
Married or common law	17	3.8
Committed relationship	99	22.0
Dating (exclusive)	94	20.9
Dating (not exclusive)	28	6.2
Friends with benefits	35	7.8
Hook up/fuck buddy/booty call	41	9.1
Friend (no sexual benefits right now)	79	17.6
Colleague/acquaintance	32	7.1
Other	13	2.9
Gender Identity of Sexual Partner—Partner Prompt Question		
Cisgender man	315	70.0
Cisgender woman	118	26.2
Other	5	1.0

Note. Some variable percentages do not equal 100% due to missing data or “prefer not to answer” selections. <sup>a</sup> Participants who responded *other* listed Vietnamese, Turkish, Spanish, Serbian, Russian, Romanian, Mandarin, Arabic, Bulgarian, Chinese, Farsi, Créole, Dutch, Croatian, Hindi, Indonesian, Italian, Kinyarwanda, Kirundi, Korean, Mauritian Creole, Pashto, Persian, Tagalog, and Portuguese as their first language. <sup>b</sup> Participants who selected *other* indicated that they no longer speak with said partner, the relationship is complicated, they are separated, it was a one-night-stand partner, the partner is someone that they know, the partner is a friend, the partner is an ex-partner, they are exclusive but not dating, or they are in an open relationship.

## 2.2. Measures

### 2.2.1. Background Questionnaire

The background questionnaire consisted of 18 questions separated into two sections. The first section contained close-ended questions asking about participants’ demographic characteristics, including gender identity, race/ethnicity, minority status (i.e., visible minority and invisible minority), sexual orientation, current relationship status, first language, and education. For all these questions, participants selected which of the options best described them or chose “Other (please specify)” and wrote their own descriptions. Partic-

Participants were also able to select “Prefer not to answer”. The second section was about the participant’s use of technology. Participants indicated how long they have used the internet (reported in total years) and what technological devices they used in the last 12 months to connect with others.

### 2.2.2. Partner Prompt Questions

To provide a specific sexual relationship context for this study, we developed questions to focus participants on a specific sexual partner. First, we asked participants to think of a sexual partner and indicate what kind of relationship they were in with this person (e.g., current sexual partner, past sexual partner, or potential sexual partner). Next, participants responded to two questions about the specific sexual partner they were thinking of. Participants selected the best relationship status from a list to describe the one shared between them and the sexual partner they were thinking of (e.g., married/common law, exclusively dating, friends with benefits, etc.). Participants also indicated the gender identity of their specific sexual partner. Finally, participants input a name for the sexual partner they were thinking of; we used this name in the survey with display logic to remind participants to think of the same specific sexual partner when responding to measures of SSD, and the IEMSS.

### 2.2.3. Sexual Self-Disclosure In-Person and Via Typed Technology

We adapted 27 items of the original Sexual Self-Disclosure Scale (72 items) [1] to assess the frequency of SSD that occurred in-person (i.e., SSD in-person) and by typed technology (SSD typed technology). We used only the items related to nine subtopics using the original conceptual divisions. Specifically, we included items related to sexual behaviors (three items, e.g., “my past sexual experiences”), sexual sensations (three items, e.g., “the kinds of touching that sexually arouse me”), sexual fantasies (three items, e.g., “my private sexual fantasies”), sexual preferences (three items, e.g., “what I would desire in a sexual encounter”), the meaning of sex (three items, e.g., “what sex in an intimate relationship means to me”), distressing sex (three items, e.g., “times when I was pressured to have sex”), sexual dishonesty (three items, e.g., “times I have pretended to enjoy sex”), sexual delay preferences (three items, e.g., “the times I might not want to have sex”), and sexual satisfaction (three items, e.g., “how pleased I feel about the sexual aspects of my life”). As such, we removed 15 items about sexual attitudes (e.g., “my personal views about homosexuals”) and 27 items about sexual feelings and emotions (e.g., “how serene I feel about the sexual aspects of my life”). Our revised scale can be found on OSF: [https://osf.io/u2swt/?view\\_only=4a6cc3de32214e2abfe96f5554d63738](https://osf.io/u2swt/?view_only=4a6cc3de32214e2abfe96f5554d63738). Before completing this scale, we presented instructions to remind participants of the name they provided for the Partner Prompt Question. Participants indicated the extent to which they had discussed each topic using a 5-point Likert scale ranging from 1 = I have NOT discussed this topic to 5 = I have completely discussed this topic. Participants completed this measure twice: once for using “typed or text-based technology” and once for “in-person”.

We used participants’ responses on this measure to create two kinds of frequency scores—one that represented the total frequency of SSD for each separate context (in-person and typed technology), and the other to represent the frequency of nine subtopics in each context. First, we summed each participant’s raw responses across all 27 items within the respective context to create total SSD frequency scores (i.e., Frequency of SSD Typed Technology, Frequency of SSD In-Person). Total SSD frequency scores could range from 27 to 135, where higher scores indicate a greater frequency of SSD. In this study, both the total Frequency SSD Typed Technology and In-Person scores had a high internal consistency of  $\alpha = 0.98$ . Second, we calculated frequency scores for each of the nine subtopics [1]. Given our modification of the original scale, we had three items for each subtopic for both the in-person and typed-technology contexts. The names, contexts, and internal consistencies for these subtopics are reported in Table 2. Total subtopic scores range from 3 to 15, where higher total scores indicate more frequent disclosure of the sexual subtopic.

**Table 2.** Internal consistencies and gender differences in subtopics of SSD within each context.

Subtopic	Typed					In-Person				
	$\alpha$	Men M (SD)	Women M (SD)	$\eta^2$ (95% CI)	F(df)	$\alpha$	Men M (SD)	Women M (SD)	F(df)	$\eta^2$ (95% CI)
Sexual behaviors	0.87	6.63 (4.03)	6.18 (3.53)	0.00 (0.00, 0.02)	1.07 (166)	0.89	8.13 (4.30)	9.20 (4.12)	5.29 (178) *	0.01 (0.00, 0.04)
Sexual sensations	0.93	6.65 (4.09)	6.76 (4.04)	0.00 (0.00, 0.01)	0.07 (183)	0.94	8.21 (4.52)	9.34 (4.22)	5.38 (174) *	0.01 (0.00, 0.04)
Sexual fantasies	0.89	6.13 (3.51)	6.31 (3.86)	0.00 (0.00, 0.01)	0.21 (201)	0.90	7.03 (4.03)	7.22 (3.95)	0.19 (0.66)	0.00 (0.00, 0.01)
Sexual preferences	0.92	7.05 (4.22)	7.02 (4.02)	0.00 (0.00, 0.01)	0.00 (178)	0.91	8.43 (4.28)	9.34 (4.15)	3.80 (181)	0.01 (0.00, 0.03)
Meaning of sex	0.91	6.33 (3.88)	6.59 (3.93)	0.00 (0.00, 0.01)	0.37 (187)	0.93	7.75 (4.42)	9.04 (4.54)	6.98 (189) **	0.02 (0.00, 0.04)
Distressing sex	0.87	4.74 (3.18)	5.30 (3.24)	0.01 (0.00, 0.03)	2.56 (188)	0.86	5.66 (3.51)	7.30 (3.96)	16.93 (206) **	0.03 (0.01, 0.07)
Sexual dishonesty	0.81	5.04 (3.23)	5.03 (2.97)	0.00 (0.00, 0.00)	0.00 (172)	0.78	6.05 (3.64)	6.53 (3.60)	1.49 (183)	0.00 (0.00, 0.02)
Sexual delay preferences	0.89	5.09 (3.15)	5.76 (3.35)	0.01 (0.00, 0.03)	3.65 (195)	0.89	6.29 (3.79)	8.44 (4.11)	25.50 (199) **	0.05 (0.02, 0.09)
Sexual satisfaction	0.98	6.06 (3.93)	6.49 (4.02)	0.00 (0.00, 0.02)	0.96 (188)	0.97	7.55 (4.34)	8.71 (4.46)	5.94 (189) *	0.01 (0.00, 0.04)

Note. N = 450; scores within each subtopic range from a minimum score of 3 to a maximum of 15; F(df) represents Welch’s statistic;  $\alpha$  = Cronbach’s alpha; \* indicates that the comparison between men and women was significant at the  $p < 0.05$  level, \*\* indicates that the comparison between men and women was significant at the  $p < 0.01$  level.

We also used the items on this measure to calculate SSD breadth scores for each context. We first recoded the participant item-level answers into a dichotomous response scale where *I have not discussed this topic* (1) was coded as 0 and any amount of discussion (2, 3, 4, or 5) was coded as 1 = *discussed*. Then, we summed the dichotomous scores within each context to represent the number of different topics discussed in the respective context overall (Breadth SSD In-Person, Breadth SSD Typed Technology). The Breadth SSD Typed Technology and In-Person scores both had Kuder–Richardson 20 scores (used as a metric of internal consistency given the dichotomous way that breadth scores were coded) of 0.97. Breadth scores ranged from 0 to 27, where higher scores represent more topics discussed.

2.2.4. Global Measure of Sexual Satisfaction (GMSEX) [55]

We used the GMSEX to measure participants’ sexual satisfaction in relation to the sexual partner they had selected in the Partner Prompt Question. Participants reported their feelings about their sexual satisfaction with this partner using five 7-point bipolar ratio scales (e.g., *Very Bad* to *Very Good*; *Worthless* to *Very Valuable*). We summed these responses to calculate a total GMSEX score, ranging from 5 to 35, with higher scores representing greater sexual satisfaction. Consistent with past research [55], we found high internal consistency for the GMSEX in our sample ( $\alpha = 0.96$ ).

2.2.5. Global Measure of Relationship Satisfaction (GMREL) [55]

The GMREL is similar to the GMSEX but evaluates relationship satisfaction. We modified the instructions to remind participants to think of the same person they had selected in the Partner Prompt Question. Participants reported their feelings about their relationship satisfaction by using five 7-point bipolar ratio scales (e.g., *Very Bad* to *Very Good*; *Worthless* to *Very Valuable*). We summed these items to create total GMREL scores that ranged from 5 to 35, where higher total scores indicated greater relationship satisfaction. The GMREL in our study has high internal consistency  $\alpha = 0.95$ .



### 2.2.6. Exchanges Questionnaire (EQ) [55]

We used the Exchanges Questionnaire to evaluate participants' perceived levels of sexual costs and sexual rewards in their sexual life [55]. Participants responded to four items in total using a 9-point scale ranging from 1 = *not at all rewarding* to 9 = *extremely rewarding*. To assess total perceived sexual rewards, we had participants indicate their level of sexual rewards as well as their level of sexual costs (two items). We then subtracted each participant's level of sexual costs from their level of sexual rewards, which provided the total perceived rewards score for the participant:  $REW - CST$ . Then, we assessed participants' comparison level sexual rewards. Again, we used two items: one assessed participants' level of sexual rewards in comparison to their expected level of rewards (what their sexual rewards "*should be*"), and one assessed participants' level of sexual costs in comparison to their level of expected costs (what their sexual costs "*should be*") [55]. We then subtracted each participant's comparison level of sexual costs from their comparison level of sexual rewards, which provided the total comparison level of sexual rewards for each participant:  $CL_{REW} - CL_{CST}$ . Scores for both  $REW - CST$  and  $CL_{REW} - CL_{CST}$  ranged from  $-8$  to  $+8$ , where positive and higher scores indicate greater total perceived sexual rewards and greater total comparison sexual rewards.

### 2.3. Procedure

This study was conducted in accordance with the Tri-Council Policy Statement of the Government of Canada and approved by a Canadian university's Research Ethics Board. We recruited participants between November 2019 and June 2020 (Data collection occurred before the start of the COVID-19 pandemic and continued after social distancing guidelines were implemented in Ottawa, Canada on 22 March 2020. However, there was no significant difference in SSD frequency scores in-person or via technology when comparing the data from pre-COVID 19 and during COVID-19 ( $p > 0.05$ ) [56].) to an anonymous online survey in two ways: through an introduction to a psychology research participant pool (72%), and via in-person and online advertisements (18%; 10% did not indicate where they found the study). The research participant pool is a program at a Canadian university that allows undergraduate psychology students to participate in research in exchange for credits toward their courses. Students enrolled in this pool choose amongst many online and in-person studies on a wide variety of topics to obtain credits. We also advertised the link to the survey through a QR code on posters that were posted around the university and on our lab's social media.

The link to this study directed participants to the consent form, which contained information about the study, potential benefits and risks, anonymous and confidential data management procedures, and the researcher's contact information. People who consented were redirected to the beginning of the survey. Participants first responded to demographic and relationship context questions, which included the Partner Prompt Question. Next, participants responded to the modified SSDS [1]. This scale was presented twice, in random order: one time for in-person SSD, and again for typed technology. Afterward, participants responded to the GMSEX, GMREL, and EQ [55] in that order. The whole survey included additional measures about sexual liking, personality, social phobia, motivation, boredom proneness, desirable responding, and survey experience questions that are not reported in this study. After completing the survey, participants were debriefed about the purpose of the study and provided mental health resources. Participants were also able to indicate again whether they wanted their data included in this study. As remuneration for completing the survey, participants from the participant pool were granted 1 credit towards an introductory psychology course, and community participants could enter their names in a draw for one of five \$30 Amazon gift cards. The survey took between 10 min and 2 h (representing less than 3SD above and below the mean) to complete.

### 2.4. Data Analysis

We used SPSS 27 [57] for data cleaning, screening, and all analyses. To explore the frequency and breadth of young adults’ SSD in each context (RQ1), we examined descriptive statistics. To test whether young adults engaged in SSD more frequently and widely via typed technology than in-person (H1), we conducted paired-sample *t*-tests. Data met all assumptions for this *t*-test. Paired-sample *t*-tests were also used to assess men’s and women’s frequency and breadth of SSD in each context (RQ2), and whether women disclosed more frequently and with greater breadth of SSD than men in both contexts (H2). To assess gender differences in the frequency of subtopics reported (H2), we ran separate Welch’s ANOVAs for in-person and for typed-technology contexts. We used Welch’s ANOVA because of the unequal sample sizes and the likelihood of unequal variances on some of the subtopics. Indeed, Levene’s test was significant for two subtopics in the in-person context only (sexual delay preferences,  $p = 0.03$ ; and distressing sex,  $p = 0.002$ ). All other subtopics met the assumptions for the ANOVAs.

To test H3, H4, H5, and H6 and, therefore, our hypothesized model, we conducted path analysis using SPSS AMOS [58]. We tested two versions of the hypothesized model: one using Frequency SSD scores and one using Breadth SSD scores. In each model, gender was coded as 1 = *cis/trans men*, 2 = *cis/trans women*. All variables as well as the multivariate distribution demonstrated acceptable skewness and kurtosis within ranges outlined by Hair and colleagues [59] and Byrne [60]. Model fit was assessed by analyzing Pearson’s  $\chi^2$  (non-significance), the comparative fit index (CFI), and the root mean square error of approximation (RMSEA). CFI values were assessed for adequacy via values > 0.95, with RMSEA values assessed via values < 0.06 [61]. Models were run using a bootstrap of 1000 and evaluated within 95% confidence intervals.

## 3. Results

### 3.1. Frequency and Breadth of SSD in Each Context

On average, participants reported frequent SSD in-person overall, and somewhat frequent SSD via typed technologies overall (RQ1, see means and standard deviations in Table 3). Most participants engaged in at least one SSD via typed-technology (83.1%) and in-person methods (91.1%). Participants reported sexually self-disclosing an average of 12.45 topics via typed technology and 17.43 topics in-person (out of 27 topics in total). Contrary to our hypothesis (H1), the results of the paired-samples *t*-test suggested that participants sexually self-disclosed significantly more frequently in-person than via typed technology ( $t(449) = 13.32, p < 0.001$ , Hedge’s corrected Cohen’s  $d = 0.63$ ; 95% CI [0.53, 0.73]), and significantly more topics in-person compared to via typed technology ( $t(449) = 12.62, p < 0.001$ , Hedge’s corrected Cohen’s  $d = 0.60$ ; 95% CI [0.49, 0.70]).

**Table 3.** Descriptive statistics of SSD frequency and breadth, sexual and relationship satisfaction, and rewards and costs.

Variable	Min–Max Score	Mode	M (SD)	Gender Comparison			
				Men M (SD)	Women M (SD)	<i>p</i> -Value	$\eta^2$ [95% CI]
Frequency of SSD typed technology	27–135	27	55.02 (28.89)	53.70 (29.28)	55.44 (28.79)		0.00 [0.00, 0.01]
Frequency of SSD in-person	27–135	27	72.67 (32.30)	65.09 (32.85)	75.12 (31.78)	**	0.02 [0.00, 0.05]
Breadth of SSD typed technology	0–27	0	12.45 (9.78)	11.72 (10.37)	12.68 (9.59)		0.00 [0.00, 0.02]
Breadth of SSD in-person	0–27	27	17.43 (9.18)	15.24 (10.10)	18.14 (8.77)	**	0.02 [0.00, 0.05]
GMSEX	5–35	35	25.81 (7.09)	24.60 (7.58)	26.20 (6.89)	*	0.01 [0.00, 0.04]
GMREL	5–35	35	26.83 (8.36)	24.79 (9.85)	27.49 (7.72)	**	0.02 [0.00, 0.05]
Rewards and costs	–8+8	0	2.28 (3.08)	2.46 (3.06)	2.22 (3.09)		0.00 [0.00, 0.02]
Rewards and costs compared to expectations	–8+8	0	1.16 (3.17)	1.24 (3.03)	1.13 (3.21)		0.00 [0.00, 0.01]

Note. SSD = sexual self-disclosure, GMSEX = global measure of sexual satisfaction, GMREL = global measure of relationship satisfaction; \* indicates  $p < 0.05$ ; \*\* indicates  $p < 0.01$ .

### 3.2. Gender Differences in Frequency and Breadth of SSD

As depicted in Table 3, men and women sexually self-disclosed at a similar frequency via typed technology; however, women significantly sexually self-disclosed more frequently in-person than men. Likewise, men and women reported a similar total breadth of SSD via typed technology; however, women disclosed significantly more topics than men in-person.

Table 2 depicts the results of Welch’s ANOVAs for the frequency of the nine SSD subtopic scores for men and women. The results revealed that women reported significantly greater average frequency scores of SSD for most subtopics in the in-person context compared to men. Specifically, on average, women self-disclosed about sexual behaviors, sexual sensations, the meaning of sex, distressing sex, sexual delay preferences, and sexual satisfaction more often than men did in-person. There was no significant difference between men and women’s SSD scores for the subtopics of sexual fantasies and sexual dishonesty. Overall, the results support our hypothesis that women disclose more frequently and with greater breadth than men in the in-person context.

For the typed-technology context, there were no significant differences between women’s and men’s frequency of SSD for any of the reported subtopics. Although not significantly different, women had greater mean scores for sexual sensations, sexual fantasies, meaning of sex, distressing sex, sexual delay preferences, and sexual satisfaction than men.

### 3.3. Path Models of the Relationships between Gender, Frequency of SSD, Rewards/Costs, and Sexual Satisfaction

Means and standard deviations for all variables in the hypothesized models are reported in Table 2. In Table 4, we report the bivariate correlations between each set of variables in the models.

**Table 4.** Pearson correlations among variables in path models for men (below the diagonal) and women (above the diagonal).

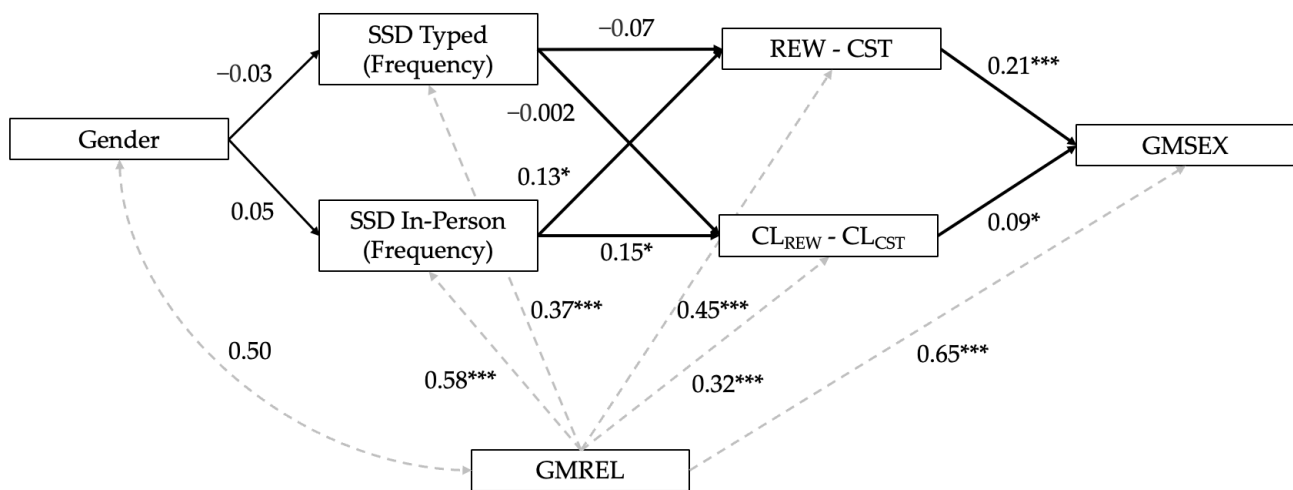
Variables	1.	2.	3.	4.	5.	6.	7.	8.
1. SSD Typed (Frequency)	-	0.56 **	0.89 **	0.51 **	0.18 **	0.23 **	0.26 **	0.36 **
2. SSD In-Person (Frequency)	0.67 **	-	0.53 **	0.88 **	0.36 **	0.35 **	0.53 **	0.56 **
3. SSD Typed (Breadth)	0.88 **	0.59 **	-	0.58 **	0.14 *	0.15 **	0.26 **	0.34 **
4. SSD In-Person (Breadth)	0.63 **	0.89 **	0.69 **	-	0.28 **	0.28 **	0.49 **	0.57 **
5. REW—CST	0.14	0.35 **	0.13	0.27 **	-	0.65 **	0.60 **	0.51 **
6. CL <sub>REW</sub> —CL <sub>CST</sub>	0.14	0.33 **	0.11	0.27 **	0.58 **	-	0.54 **	0.45 **
7. GMSEX	0.33 **	0.59 **	0.30 **	0.51 **	0.59 **	0.35 **	-	0.79 **
8. GMREL	0.40 **	0.61 **	0.39 **	0.58 **	0.52 **	0.32 **	0.79 **	-

Note. N = 110 men, 340 women; SSD = sexual self-disclosure, REW = sexual rewards, CST = sexual costs, CL<sub>REW</sub> = comparison of own sexual rewards with expected sexual rewards, CL<sub>CST</sub> = comparison of own sexual costs with expected sexual costs, GMREL = relationship satisfaction, GMSEX = sexual satisfaction. \* =  $p < 0.05$ ; \*\* =  $p < 0.01$ .

In testing the hypothesized model for the frequency of SSD, we noted that the unconstrained model demonstrated a poor fit across all indices;  $\chi^2[7] = 303.34$ ,  $p = 0.000$ ; CFI = 0.77; RMSEA = 0.31. Given this poor fit, we inspected modification indices to evaluate covariance among error terms, in line with our theoretical framework, to improve the fit of our model. Accordingly, we correlated the error terms for SSD via typed technology and in-person ( $\chi^2[6] = 180.30$ ,  $p = 0.000$ ). We re-ran the model, inspected the fit indices, and then adjusted for covariance by correlating the error terms for both perceived and comparison rewards and costs ( $\chi^2[5] = 23.20$ ,  $p = 0.000$ ). This was followed by a third

model modification where we correlated error terms for SSD in-person and sexual satisfaction ( $\chi^2[4] = 17.90, p = 0.000$ ). Finally, we ran a model where we correlated the error terms for SSD via typed technology and sexual satisfaction ( $\chi^2[3] = 8.0, p = 0.05$ ). This final re-specified model demonstrated an acceptable fit ( $\chi^2[3] = 8.0, p = 0.05$ ; CFI = 0.996; RMSEA = 0.06).

For the re-specified model, gender was not significantly associated with the total frequency of SSD via typed technology or in-person, as shown in Figure 2 (see figure for regression weights and significance of association). SSD via typed technology was not significantly associated with perceived rewards and costs or with the comparison of rewards and costs. However, SSD in-person was significantly associated with perceived rewards and costs ( $\beta = 0.13, p < 0.05$ ) and the comparison of rewards and costs ( $\beta = 0.15, p < 0.05$ ). Perceived rewards and costs were significantly associated with sexual satisfaction ( $\beta = 0.21, p < 0.001$ ) as was the comparison of rewards and costs ( $\beta = 0.09, p < 0.05$ ). Relationship satisfaction, as a control, was significantly associated with gender, both SSD contexts, both reward/cost variables, and sexual satisfaction.



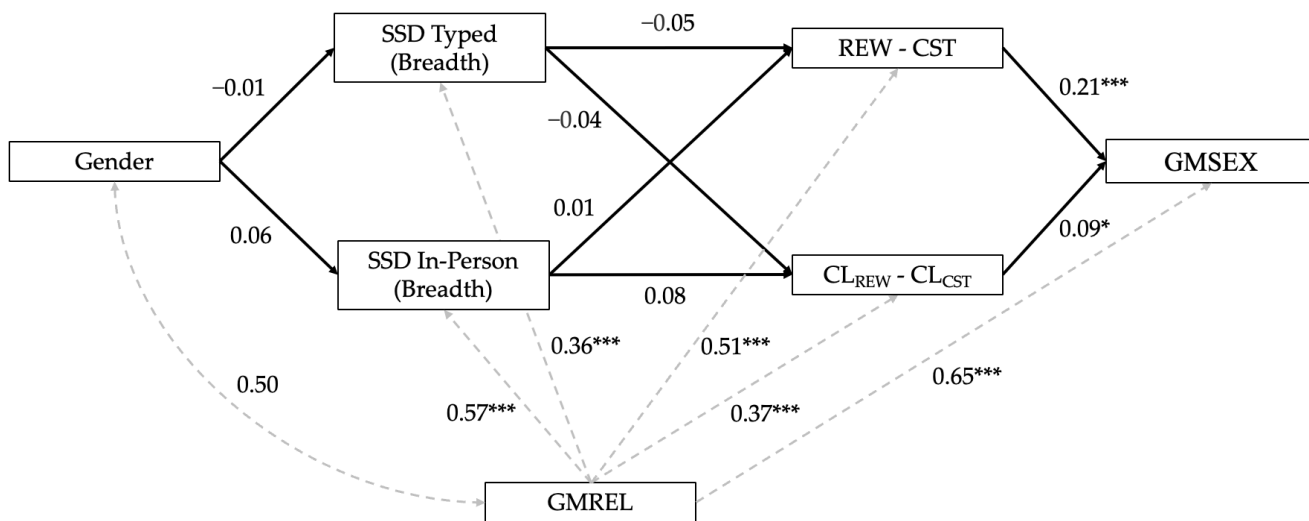
**Figure 2.** Path model predicting sexual satisfaction from sexual rewards, the frequency of sexual self-disclosure, and gender. *Note.* N = 450; values represent standardized regression coefficients ( $\beta$ ) of all variables in the hypothesized model; SSD = sexual self-disclosure, REW = sexual rewards, CST = sexual costs, CL<sub>REW</sub> = comparison of own sexual rewards with expected sexual rewards, CL<sub>CST</sub> = comparison of own sexual costs with expected sexual costs, GMREL = relationship satisfaction, GMSEX = sexual satisfaction. \* indicates that the comparison between men and women was significant at the  $p < 0.05$  level, \*\*\* indicates that the comparison between men and women was significant at the  $p < 0.01$  level.

### 3.3.1. Indirect Effects

For the total frequency of SSD model, gender exerted a nonsignificant indirect effect of 0.01 on the scores of comparisons of rewards and costs ( $p = 0.05, 95\% \text{ CI } [-0.01, 0.02]$ ) and a nonsignificant indirect effect of 0.008 on the scores of perceived rewards and costs ( $p = 0.05, 95\% \text{ CI } [-0.002, 0.02]$ ). Gender exerted an indirect effect of 0.002 on sexual satisfaction, which was not significant ( $p = 0.05, 95\% \text{ CI } [-0.001, 0.01]$ ). In the typed-technology context, the frequency of SSD exerted a nonsignificant indirect effect of  $-0.01$  on sexual satisfaction ( $p = 0.05, 95\% \text{ CI } [-0.04, 0.01]$ ) while the in-person frequency of SSD exerted a significant indirect effect of 0.04 ( $p = 0.05, 95\% \text{ CI } [0.01, 0.08]$ ). As a control variable, we also tested the indirect effects of relationship satisfaction. Relationship satisfaction exerted a significant indirect effect of 0.09 on comparisons of rewards and costs ( $p = 0.05, 95\% \text{ CI } [0.03, 0.16]$ ), a nonsignificant indirect effect of 0.05 on perceived rewards and costs ( $p = 0.05, 95\% \text{ CI } [-0.01, 0.11]$ ), and a significant indirect effect of 0.13 on sexual satisfaction ( $p = 0.05, 95\% \text{ CI } [0.09, 0.17]$ ).

### 3.3.2. Breadth of SSD

For the total breadth of SSD, we noted that the unconstrained model demonstrated a poor fit across all indices;  $\chi^2[7] = 172.90, p = 0.000; CFI = 0.75; RMSEA = 0.32$ . Given this poor fit, we examined modification indices to evaluate covariances amongst error terms and if we could improve model fit with theoretical support. Accordingly, we correlated the error terms for SSD via typed technology and in-person ( $\chi^2[6] = 322.61, p = 0.000$ ), as we believed the decision was theoretically justified. We then re-ran the model, inspected the fit indices, and allowed for a correlation between error terms for both perceived and comparison rewards and costs ( $\chi^2[5] = 12.50, p = 0.03$ ). After running the model again, we added correlated error terms for SSD in-person and sexual satisfaction; this final step resulted in a re-specified model that demonstrated an acceptable fit ( $\chi^2[4] = 6.95, p = 0.14; CFI = 0.998; RMSEA = 0.04$ ; depicted in Figure 3).



**Figure 3.** Path model predicting sexual satisfaction from sexual rewards, the breadth of sexual self-disclosure, and gender. *Note.* N = 450; values represent standardized regression coefficients ( $\beta$ ) of all variables in the hypothesized model; SSD = sexual self-disclosure, REW = sexual rewards, CST = sexual costs, CL<sub>REW</sub> = comparison of own sexual rewards with expected sexual rewards, CL<sub>CST</sub> = comparison of own sexual costs with expected sexual costs, GMREL = relationship satisfaction, GMSEX = sexual satisfaction. \* indicates that the comparison between men and women was significant at the  $p < 0.05$  level, \*\*\* indicates that the comparison between men and women was significant at the  $p < 0.01$  level.

In the re-specified total breadth of SSD model, gender was not significantly associated with SSD via typed technology or in-person. Furthermore, neither SSD via typed technology nor SSD in-person significantly predicted perceived rewards and costs or the comparison of rewards and costs. Perceived rewards and costs were significantly associated with sexual satisfaction ( $\beta = 0.21, p < 0.01$ ) as was the comparison of rewards and costs ( $\beta = 0.09, p < 0.05$ ). Relationship satisfaction, as a control, was significantly associated with gender, both SSD contexts, both reward/cost variables, and sexual satisfaction.

### 3.3.3. Indirect Effects

For the total breadth of SSD model, gender exerted a non-significant indirect effect of 0.005 on the scores of comparisons of rewards and costs ( $p = 0.05, 95\% CI [-0.004, 0.02]$ ) and a non-significant indirect effect of 0.001 on the scores of perceived rewards and costs ( $p = 0.05, 95\% CI [-0.01, 0.01]$ ). Gender exerted an indirect effect of 0.001 on sexual satisfaction, which was also not significant ( $p = 0.05, 95\% CI [-0.002, 0.003]$ ). In the typed-technology context, the breadth of SSD exerted a non-significant indirect effect of -0.01 on sexual satisfaction ( $p = 0.05, 95\% CI [-0.05, 0.01]$ ) and the in-person breadth of SSD

exerted a non-significant indirect effect of 0.01 ( $p = 0.05$ , 95% CI  $[-0.02, 0.04]$ ). As a control variable, the indirect effects of relationship satisfaction were also tested. Relationship satisfaction exerted a non-significant indirect effect of 0.03 on comparisons of rewards and costs ( $p = 0.05$ , 95% CI  $[-0.02, 0.09]$ ), of  $-0.02$  on perceived rewards and costs ( $p = 0.05$ , 95% CI  $[-0.07, 0.04]$ ), and a significant indirect effect of 0.14 on sexual satisfaction ( $p = 0.05$ , 95% CI  $[0.10, 0.17]$ ).

Overall, in the model testing results, only the total frequency of SSD in-person (not via typed technology) was significantly associated with perceived rewards and costs and the comparison of rewards and costs. Perceived rewards and costs were subsequently and significantly associated with sexual satisfaction, as was the comparison of rewards and costs. These results support Hypotheses 3a, 4a, and 5a. However, we found only partial support for Hypothesis 6a: the total frequency of SSD only in the in-person context exerted significant indirect effects on sexual satisfaction. Thus, participants (regardless of gender) who reported more frequent SSD in-person also reported more sexual satisfaction in part because of increased perceived and comparison of rewards and costs. We did not find support for our Hypotheses 3b, 4b, 5b, and 6b; the breadth of SSD did not function in the same way as the SSD frequency.

#### 4. Discussion

The purpose of this study was to examine the extent to which women's and men's in-person and typed-technology SSD differed in frequency and breadth, and the extent to which each predicted perceived sexual rewards, comparison of sexual rewards, and in turn sexual satisfaction. To our knowledge, this study is the first to examine and compare SSDs in an in-person context and a typed-technology context. Contrary to our predictions, both young men and women did not sexually self-disclose more frequently or widely via typed technology compared to in-person. In line with past research, women sexually self-disclosed more often and widely than men—but only in the in-person context [3,5,36,37]. The results of our IEMSS models showed that a greater frequency of SSD *in-person* is predictive of greater sexual rewards over costs, and a more favorable comparison of perceived sexual rewards and costs to expected sexual rewards and costs. In turn, these perceived sexual rewards and comparison rewards predict greater sexual satisfaction. In other words, a person's gender and the number of different sexual topics that they self-disclose may not matter for improving sexual exchanges and sexual satisfaction; it may only be important that people self-disclose more frequently and do so in-person to experience greater sexual satisfaction from these disclosures. Our results improve SSD research by demonstrating that people sexually self-disclose via technology, albeit not as much as in-person, and providing initial evidence that disclosures via technology may not matter for the rewards, costs, and sexual satisfaction that people experience in sexual relationships.

##### 4.1. Sexual Self-Disclosure In-Person and Via Typed Technology

This study contributes to knowledge on SSD by demonstrating ways in which young adults' typed-technology SSDs are likely extensions of their in-person SSDs. Our findings suggest consistent patterns in what and how much people communicate about their sexuality with partners, which span in-person and technology-mediated contexts. For instance, participants' average frequency and breadth of SSD in each context were moderate. Additionally, we observed large variability from person to person in the frequency and breadth of SSD in both contexts. Furthermore, the SSD frequency of subtopics in both contexts followed a similar pattern, where some subtopics were disclosed more or less often than others. Specifically, sexual preferences, sexual behaviors, and sexual sensations were discussed the most in each context, whereas distressing sex and sexual dishonesty were discussed the least in each.

The similarities in the patterns of SSD across in-person and typed-technology contexts suggest that individual differences as well as social or cultural norms of communication may extend beyond the context or medium in which they take place. In other words,

additional contexts may determine how people sexually self-disclose via typed technology such as their immediate environment (e.g., what application is used, whether there are people around them physically; e.g., [62]) and extra-situational factors (e.g., social and cultural influences; e.g., [63]). At the person level, some people may have felt more safe or comfortable talking about sexual topics regardless of the context than others. This range in comfort level may have contributed to the range and variability (e.g., large standard deviation) in both how much and how many topics people reported self-disclosing within each context. This finding is consistent with research that has found that people who are more extroverted tend to communicate with others often both in person as well as through text and social media [64,65]. Similarly, it is possible that people may find topics like sexual preferences, behaviors, and sensations more enjoyable to disclose than distressing sex and sexual dishonesty, and thus engage in SSD more about the former topics than they do the latter, no matter the context. In fact, some research suggests that people feel ashamed or fearful of discussing sexual topics that are associated with negative sexual encounters, such as sexual victimization (e.g., [66])—which may be connected to SSD about distressing sex. Research also suggests that people are less likely to talk about sexual topics that include potential threats of feeling ashamed, embarrassed, or rejected by their partner [30,67]; self-disclosures about sexual dishonesty may bring up these threats. At the social norms level, the similarities between SSD in-person and via typed technology are consistent with research on sexual scripts in online sexual activities that support a continuation of sexual behavior norms in technology-mediated from in-person contexts [20,41–43]. In this study, some norms for sexual communication in-person appeared to persist in typed-technology contexts. Future research could elucidate the extent to which similarities in SSD in-person and via typed technology have more to do with persisting communication norms or individual difference variables.

In contrast, some of our results suggest that the affordances of SSD in-person may be preferable to those provided by a typed-technology context. Overall, we found that participants reported greater SSD in-person than via typed technology. Furthermore, gender differences in SSD were found in the in-person context alone, and only SSD in-person was associated with sexual exchanges and sexual satisfaction. In close relationships such as friendships, young adults have reported that the lack of non-verbal cues via typed technology makes it harder to continue conversations and to sense their friends' emotions during the conversation [68]. Furthermore, young adults report favoring in-person conversations because they feel that they can engage deeper, foster more intimacy and closeness, and have more valuable interactions compared to technology-mediated conversation [68]. Indeed, in face-to-face encounters, partners can establish a direct and immediate connection with one another, creating a heightened sense of intimacy (e.g., [69]). Given that SSD involves personal thoughts, feelings, and experiences, these characteristics of in-person communication may be particularly important when people consider where to engage in SSD. It is also possible that people have a greater sense of control over their SSDs in-person more so than via technology, particularly in terms of who has access to them and when the access ends. Unfortunately, some people have direct, and many people have vicarious, experience with non-consensual sharing of SSDs with audiences for whom the personal sexual content was not intended [70–72]. This knowledge may heighten people's concerns about the privacy and security of their SSDs if sent by technology—even if these are via typed messages. Thus, despite affordances that may lead some people to engage in SSD via typed technology, SSD in-person appears to occur more and is more beneficial. People may want to take advantage of the ability to foster intimacy, bond emotionally, and control their message and privacy by having their sexual conversations in-person.

#### *4.2. Gender Differences in SSD*

Our findings replicate and extend research on gender roles and norms for sexual communication and SSD in-person. Specifically, we found that women sexually self-disclosed more frequently and widely than men in the in-person context. In this context,

women also discussed seven of the nine SSD subtopics more frequently than men. These results align with past findings that women sexually self-disclose more frequently than men [3,5,36,37]. As suggested, North American gender roles prescribe women to value and engage in communication more than men [33,34]. Based on our results, it appears that this norm or expectation carries over to communication of specific sexual topics related to the self as well. Furthermore, our findings may reflect a more current North American sexual script in which women have more sexual autonomy and it is socially acceptable for women to discuss sexual topics openly [73–75].

For the typed-technology context, our results introduce a new option for how gender norms for sexual communication may appear online: women's and men's SSD shift to become more equal in technology-mediated contexts. We found that women and men tended to sexually disclose similarly in frequency and breadth in the typed-technology context. There also were no significant differences in how much they discussed each of the nine subtopics. These results contradict previous research on SSD in technology-mediated contexts in which researchers found that adolescent males sexually self-disclosed more frequently than adolescent females [28,44]. The findings also are not in line with research suggesting that gender roles in communication persist when communication occurs via technologies [76]. An inspection of the change in means between in-person and typed-technology contexts suggests that both men and women in our study decreased their SSD via technology. However, it appears that women may have decreased their SSD more so than men, effectively eliminating the gender difference observed in-person. One explanation may be related to Wallace's proposed strategy of impression management online [54]: people alter the amount of information they disclose to reflect the target person's level of disclosure. In a technology-mediated space, expectations for communication based on gender may dissipate as men and women try to disclose in a similar amount to that of their target recipient. People communicating online may try to share equally in terms of frequency and breadth as one another, so as not to overwhelm or be rejected by a partner [53]. Moreover, characteristics of typed technologies make the length and frequency of messages obvious to participants—the number of messages from each person and the length of these are evident directly on the screen. It may be that people, particularly women, edit how much they write and how quickly or often they respond to ensure that messages are received at particular intervals and with lengths that match the receiver, or some internally held expectation (see [77]). Alternatively, our findings are consistent with the Gender Similarities Hypothesis [78], which suggests that women's and men's behaviors and experiences are more similar than they are different. Indeed, the effect sizes of women's and men's SSD difference in-person were negligible. Both men and women in our study reported a moderate amount of SSD in-person, even though it was higher for women. More research is needed not only to verify the gender difference findings but also to shed light on the mechanisms through which women's and men's SSD via technology may match or shift from their SSD in-person.

#### *4.3. SSD Context and Sexual Rewards, Costs, and Satisfaction*

To our knowledge, this was the first study to empirically test whether SSD via technology alongside SSD in-person contributed to sexual satisfaction via rewards and costs, as suggested by the IEMSS. We found support for the main variables in the IEMSS: in all models, people with a greater ratio of rewards to costs and comparison of rewards and costs reported greater sexual satisfaction [2,46–48]. However, only the frequency of SSD in-person significantly contributed to the two exchanges and sexual satisfaction. The frequency of SSD via typed technology, and measures of SSD breadth did not contribute to the sexual rewards, comparison sexual rewards, or sexual satisfaction. These findings suggest that the number of specific sexual topics people self-disclose may be less important than how much they self-disclose altogether, regardless of the specific topic. Our findings also signal that the IEMSS may not connect to technology contexts such as SSD via typed technology. It is possible that SSD via typed technology may rely on different pathways



other than exchanges to relate to sexual satisfaction. For example, Kafee and Kohut [14] found that SSD via text messages was associated with feeling increased closeness with a partner—a possible mechanism by which sexual satisfaction is increased. Typed-technology SSDs may also increase comfort for SSDs in-person, which then provide the means for improving sexual rewards and in turn sexual satisfaction. Overall, our research highlights a further need to examine SSD in technology-mediated contexts to determine its connection to sexual relationship outcomes, including but not limited to sexual satisfaction.

#### *4.4. Limitations and Future Directions*

To our knowledge, this is the first study to explore SSD via typed technology since the early 2000s, and to examine the relationships between gender, SSD in-person and via typed-technology with sexual exchanges and satisfaction via the IEMSS. Our results need to be interpreted within the context of several limitations and a need for replication. First, our sample is primarily undergraduate students from a Canadian university, the majority of whom are cisgender, heterosexual, and Caucasian women. This homogeneity in our sample likely is partly due to participants volunteering for our online study; researchers have found that women, particularly in undergraduate student pools, tend to be more willing than men to volunteer for studies on sexuality [79]. At this time, the extent to which our findings generalize to men and women of different ages and life stages, educational backgrounds, and minoritized sexual identities is unknown. Moreover, people's culture and subcultures influence sexual norms and gender roles in sexual communication [80–82]. For example, researchers have suggested that women in Taiwanese cultures are expected to be unknowledgeable of sexual matters and, therefore, may not sexually self-disclose as much as men [27,75]. Future studies should recruit samples with greater sociodemographic diversity, within minoritized subgroups in multicultural nations, as in different societies and cultural contexts.

We assessed SSD from the perspective of one partner within each relationship. Much of the research on SSD suggests that assessing dyads will yield stronger and more accurate results (e.g., [4]). However, we wanted to include people in all relationship configurations, including those who are sexually self-disclosing to potential partners. Additionally, our participants reported on SSD in various types of sexual and romantic relationships. According to Social Penetration Theory, the SSD frequency and breadth vary with relationship type and length [12]. Thus, our results may be limited in grouping people in all relationship configurations, rather than comparing their responses. This choice may have resulted in missing effects that are present within one relationship type or may strengthen/decrease with the relationship length. Future research should examine the spatial context of SSD and its relationship to the IEMSS within one type of relationship separate from others while accounting for the length of the relationship in doing so.

## **5. Conclusions**

Overall, the results of this study contribute to a broader understanding of the role that sexual communication in typed-technology contexts plays in men's and women's lives. In this study, we examined women's and men's SSD in-person and via typed technology in terms of frequency and breadth. We tested whether SSD in each context predicted a person's sexual rewards, their comparison sexual rewards, and in turn their sexual satisfaction. The findings suggest that people do sexually self-disclose via typed technology but that this SSD in this spatial context is less frequent, less broad, and has little or no relationship with sexual satisfaction. The in-person SSD frequency does relate to people reporting greater sexual rewards, and to greater comparison of their rewards and costs to their partners, and these exchanges—in turn—predict greater sexual satisfaction. Despite the typed-technology context not playing a role in sexual satisfaction, our study points to an ongoing need to examine the spatial context of sexual communication. These findings may generate novel hypotheses regarding how, when, for whom, and why sexual interactions

in technology-mediated contexts differ from in-person interaction in their occurrence and relationships to sexual, relational, and well-being outcomes.

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**Data Availability Statement:** The original data presented in the study are openly available in Open Science Framework at [https://osf.io/tjsz7/?view\\_only=2fee41c02459414d8031d63eb6165c0d](https://osf.io/tjsz7/?view_only=2fee41c02459414d8031d63eb6165c0d).

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