Technology-Facilitated Sexual Violence:

Exploring Vulnerability Factors, Distress, and Coping Strategies in Women

Casey L. Oliver

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Supervisor: Dr. Dwight Mazmanian

Second Reader: Dr. Aislin Mushquash

Internal Examiner: Dr. Karen McQueen

External Examiner: Dr. Paula Barata

Abstract

Technology-facilitated sexual violence (TFSV) — sexual abuse perpetrated through technological means ─ consists of several forms of unwanted sexual behaviours, including sexual harassment, cyberstalking, image-based exploitation, unwanted sexual experiences, and gender and sexuality-based harassment. Although research on this form of gender-based violence has expanded in recent years, little is known about the women who experience it. This dissertation aimed to examine multiple dimensions of victimization to better understand TFSV. **Study One** used survey data to identify demographic and technological differences that may constitute vulnerabilities in women victims ($N = 268$). Young age, sexual minority status, popularity online, and certain patterns in technology use were identified as potential vulnerabilities for women. **Study Two** investigated the temporal relationships between TFSV and distress in women ($N = 55$) using a smartphone-based ecological momentary assessment paradigm. The results revealed multidirectional trends between these variables, including that TFSV may influence victims' negative and positive affect, distress may change over time due to TFSV experiences, and distress may also serve as a vulnerability factor for TFSV. **Study Three** explored how women cope with TFSV in its aftermath. Through in-depth interviews, women ($N = 9$) described using cognitive/emotional and behavioural risk avoidance strategies to protect themselves, including staying on guard, altering their appearance, disappearing into the shadows, assessing strangers, and protecting other women. Overall, this project illuminated the experiences of women victims of TFSV, with the goal of informing prevention and intervention strategies that center their experiences alongside the broader literature.

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Technology-Facilitated Sexual Violence:
Exploring Vulnerability Factors, Distress, and Coping Strategies in Women

Gender-based violence, or violence perpetrated against individuals due to their gender identity, gender expression, or perceived gender, is a global issue (World Health Organization, 2024). According to estimates from the World Health Organization (2024), one in three women will experience sexual violence, a form of gender-based violence, in their lifetime. Sexual violence against women has been a research topic for decades, with a specific focus on in-person contexts. This literature showcases the persistent and pervasive pattern of this violence and how it is usually perpetrated by men against women (Li et al., 2023). These men are often known to women victims, such as being current or former intimate partners, work colleagues, or family members, but are also sometimes unknown to victims (i.e., strangers; Li et al., 2023). Though sexual violence can also be perpetrated against men and by women, existing literature demonstrates the grossly gendered nature of this violence (e.g., Abrahams et al., 2014; Borumandnia et al., 2020). Hence, in this dissertation, the focus was on women as victims of sexual violence. It is also important to note that women often identify with fluctuating elements of both victimhood and survivorship (Hockett & Saucier, 2015). For consistency, the term "victims" will be used throughout this paper; however, these fluctuations should be kept in mind.

In a Canadian context, from police-reported cases of sexual assault, defined as any non-consensual contact of a sexual nature (e.g., unwanted touching, non-consensual intercourse) from 2009 to 2014, 87% of victims were women (Rotenberg, 2017). The median age of these victims was 18 years old, which showcases a major finding of this body of research: women victims of sexual violence are often young (Rotenberg, 2017). Over these years, more than 115,000 cases of sexual assault were reported to police, which is estimated to constitute only 5% of all sexual

assault cases. In a Canadian context, this translates to an estimated 2.3 million cases of sexual assault during these five years, or roughly 460,000 cases per year. This is an astounding figure that highlights how sexual violence constitutes a grave human rights violation that continues to affect women across Canada (Benoit et al., 2015).

Technology-Facilitated Sexual Violence (TFSV)

Technology poses as a specific threat to women because sexual violence can follow them everywhere through technological mediums. According to research, women are more likely than men to experience this form of sexual violence, which can be termed technology-facilitated sexual violence (TFSV; Cotter, 2019). Only two identified studies oppose this finding (Champion et al., 2022; Walker et al., 2019), whereas the rest of the body of research supports TFSV as a form of gender-based violence (e.g., Araújo et al., 2022; Dardis & Richards, 2022; Henry & Powell, 2018; Huiskes et al., 2022; Patel & Roesch, 2020). Like sexual violence in person, past research has also indicated that women often experience TFSV from those both known and unknown to them, including acquaintances, friends, and strangers on technological platforms like social media, chat applications, and dating sites (Oliver et al., 2023). Many of these experiences occur in public, meaning that other technology users witness the TFSV, in contrast to incidents that occur in private settings where other parties are not privy to the sexual violence (Oliver et al., 2023).

Two prominent researchers in this area, Henry and Powell (2014, 2015b, 2015a, 2016, 2018, etc.), have conceptualized TFSV as comprised of distinct yet overlapping categories of types of sexual violence. These include technology-facilitated sexual harassment, cyberstalking, image-based sexual exploitation, unwanted sexual experiences that are in-person but facilitated through technology (e.g., a sexual assault that occurs after meeting someone online), and gender

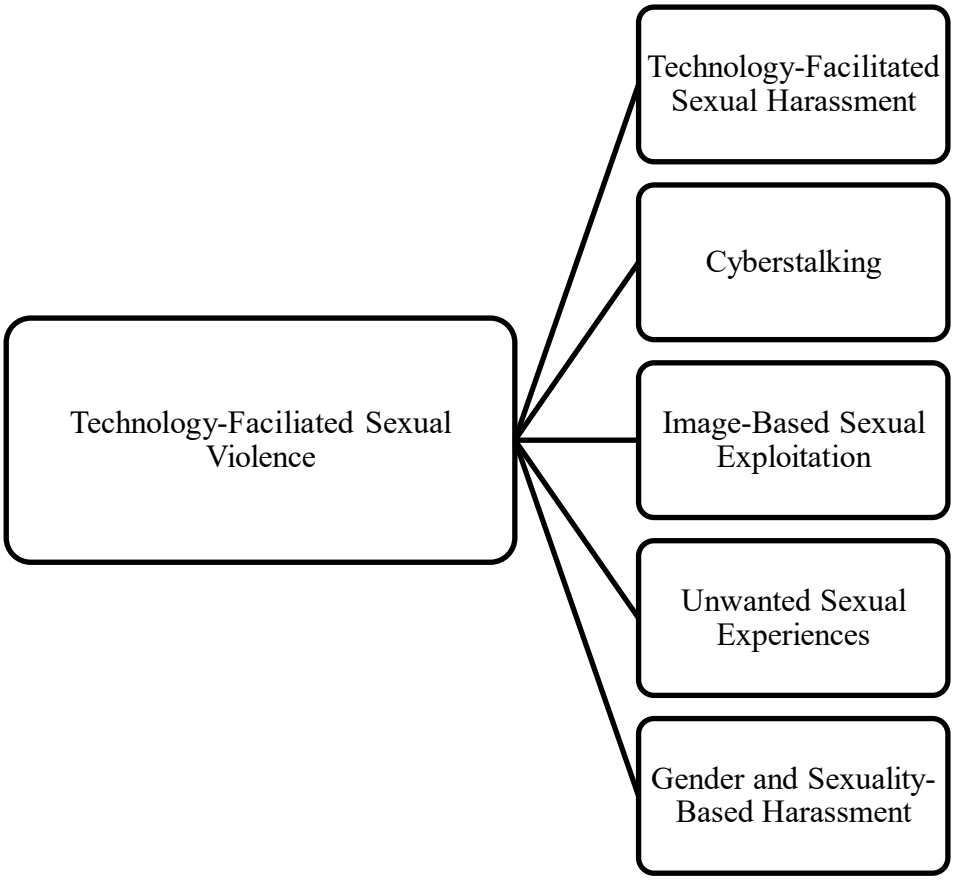
and sexuality-based harassment (Henry & Powell, 2018). Figure 1 outlines these subcategories of TFSV. In their review, Henry and Powell (2018) call attention to the extant literature in the area and how the definition of TFSV used by researchers is highly variable. Some researchers view TFSV as encompassing only one of these sub-domains (e.g., image-based exploitation; Patel & Roesch, 2020), whilst others take a broader view and include behaviours that are not of a sexual nature (e.g., Lindsay & Krysik, 2012). Furthermore, there is an abundance of studies that do not define what they are measuring, for example, by not providing information about the degree to which they were measuring general violence versus sexual violence (e.g., Duggan, 2014). This results in a lack of clarity as to the prevalence rates of TFSV, as well as the effects on victims. However, a Canadian study by Cripps and Stermac (2018) provides early estimations of prevalence rates within these subcategories, which in their sample of 80 undergraduate women ranged from the more highly reported (58%) gender and sexuality-based harassment to the less reported (8%) unwanted sexual experiences in-person.

Technology-Facilitated Sexual Harassment

Technology-facilitated sexual harassment (TFSH) appears to be one of the more common forms of TFSV, as well as one of the most researched (Henry & Powell, 2018). It can be defined as unwanted sexual attention that is received through technological means (Cripps & Stermac, 2018; Henry & Powell, 2018; Oliver et al., 2023). Though much research on TFSV has targeted TFSH, there still is an overall dearth of knowledge about this form of TFSV. Specifically, past research has focused on adolescent populations to examine TFSH (e.g., Reed et al., 2019), meaning there is little understanding of prevalence rates or effects on adult women. Previously mentioned research by Cripps and Stermac (2018) also showed that this form of TFSV was

Figure 1

A Model of Technology-Facilitated Sexual Violence



reported by 53% of their sample of young Canadian women, demonstrating that one in every two undergraduate student women may experience TFSH. Douglass et al. (2018) further noted that women in their sample were more likely to report instances of TFSH than men. Moreover, a study by Cuenca-Piqueras and colleagues (2020) indicated that TFSH may be experienced more by young women (i.e., those under 30 years of age) than older women, which aligns with results from research on sexual violence that occurs in person (Rotenberg, 2017).

Cyberstalking

Cyberstalking, defined as repeated and intrusive contact that is sexual in nature, is another sub-domain of TFSV that has received research attention (Henry & Powell, 2018). However, this attention has been mainly restricted to cyberstalking in the context of intimate partner violence (IPV; Henry & Powell, 2018). Here, the literature highlights how perpetrators of IPV will often use communication technologies to repeatedly harass, threaten, and monitor their current or former intimate partners (Fernet et al., 2019). Although prevalence rates from the literature are mixed, woman gender has been identified as a vulnerability factor for cyberstalking perpetrated by a current or former intimate partner (Fernet et al., 2019). Despite this research being valuable, it ultimately prevents a broader understanding of the nature of cyberstalking outside of intimate relationships, including when perpetrated by acquaintances and strangers. Preliminary research in this area has identified women, racialized minorities, and members of the 2SLGBTQIA+ community as experiencing more cyberstalking compared to men, White, and heterosexual individuals (Reyns et al., 2012). In this same study of cyberstalking cases, 44% were perpetrated by strangers. Hence, cyberstalking is a phenomenon that showcases features that are in line with other components of TFSV and in-person sexual violence (e.g., women victims, sometimes perpetrated by individuals unknown to the victim).

Image-Based Sexual Exploitation

Image-based sexual exploitation is a form of TFSV that involves the non-consensual creation and distribution of images and videos of a sexual nature (Henry & Powell, 2018). This subcategory includes threatening to create and distribute sexual content or non-consensual "sexting," which is the sharing of sexual images and videos (Henry & Powell, 2018). It has also been coined with terms like "revenge porn" in popular culture when ex-intimate partners non-

consensually distribute images or videos that were created in the context of a formerly consensual relationship (Branch et al., 2017). Doxing, a term that refers to accessing and sharing personal information online with malicious intent, is also present in this literature and often includes the non-consensual sharing of sexual images of a victim (Anderson & Wood, 2022). In some cases, perpetrators may engage in "sextortion," which refers to threatening to distribute sexual images or other contents if victims do not comply with certain demands (O'Malley & Holt, 2022; Ray & Henry, 2024). One estimate suggests that prevalence rates of sextortion among women range from 4% to 19% (Ray & Henry, 2024). "Deepfakes" may also be created through advances in artificial intelligence, in which a victim's face, body, or voice is replaced with that of another (Flynn et al., 2022).

Although various terms are associated with image-based exploitation, much of the research has focused on image-based sexual exploitation in adolescent populations, so less is known about the nature of it among older populations. For instance, a study by Englander (2015) showcased that among adolescents who have sexted, 70% of them had experienced some type of pressure or coercion to send images on at least one occasion. Branch et al. (2017) also indicated that victims of revenge porn were often young and female and that current or former intimate partners often perpetrated these acts. Contrary to these findings, Walker and colleagues (2019) found no associations between gender and victimization or perpetration in their survey study involving undergraduate students. Furthermore, recent findings released by the Canadian Centre for Child Protection (2022) sheds light on the many young men and boys targeted by sextortion. These experts posit that young men and boys may be targeted more for financial interest rather than sexual interest, which is more common for young women and girls. Furthermore, Walker and colleagues (2019) emphasized how women victims of image-based exploitation often

reported more coercion than men victims. Thus, these results, though noticeably different from the rest of the body of research, still suggest notable gender-related differences in these TFSV experiences.

Technology-Facilitated Unwanted Sexual Experiences

A newer area in the literature is the use of technology to facilitate unwanted sexual experiences in person (Henry & Powell, 2018). These behaviours include in-person sexual assaults perpetrated by an individual or third party with whom the victim has connected through technology, and deception or other means are often used to arrange these assaults (Henry & Powell, 2018). Despite this being a less common form of TFSV, in Cripps and Stermac's (2018) study, around 8% of their sample of women reported having experienced it. Out of all forms of TFSV, this is arguably an area that overlaps most with existing literature on in-person sexual violence due to in-person sexual violence being involved. However, the literature is relatively absent of any research on this phenomenon in adult populations. It is instead focused on children and adolescent populations due to safety concerns related to targeting children for sexual abuse (Henry & Powell, 2018). Yet, one study in Australia found that one in ten women had experienced an unwanted sexual experience with someone they met through technology, and young women were almost twice as likely to experience it compared to older women (Powell & Henry, 2017). These experiences have also been documented in research focused on its facilitation through dating applications (e.g., Valentine et al., 2023) and in the legal realm (e.g., from the perspectives of police officers; Powell & Henry, 2018).

Gender and Sexuality-Based Harassment

The last form of TFSV currently recognized by Henry and Powell (2018) is gender and sexuality-based harassment that occurs due to an individual's gender identity and/or sexual

orientation (Henry & Powell, 2018). One such behaviour is virtual rape, where a perpetrator targets one's avatar with non-consensual sexual contact through a technological space due to their perceived gender or sexual orientation (Henry & Powell, 2018). An individual may perpetrate this type of harassment but it can also be perpetrated by "cyber mobs," which involve the collective violent efforts of a group of people online (Henry & Powell, 2018). Gaming environments are one technological context where most of this research has been conducted. In past research, women have reported experiencing rape threats, sexist slurs, and other degrading and humiliating comments from other game players (Fox & Tang, 2017). Furthermore, those who use characters that are feminine are also more susceptible to this type of harassment regardless of their actual gender identity due to perceptions that they are women (De Letter et al., 2017; Yao et al., 2010). Outside of gaming settings, there has been little research conducted on gender and sexuality-based harassment through technology (Henry & Powell, 2018).

TFSV in this Project

In this project, TFSV was defined as encapsulating all forms of sexual violence outlined above. These include behaviours received by victims through any technological mediums, including online (e.g., social media, game platforms, emails) and offline (e.g., text messaging, phone calls) settings. This definition is in line with past research examining all forms of TFSV together (e.g., Cripps & Stermac, 2018; Powell & Henry, 2019). Furthermore, as noted by Henry and Powell (2018), though their conceptualization of TFSV is useful in discerning between different forms of TFSV and interpreting the literature, these forms of TFSV are overlapping. For example, a woman may experience TFSH that is intrusive and repeated, which could be labelled as both TFSH and cyberstalking. Notably, all of these forms of sexual violence are also underpinned by features of abuse, intimidation, coercion, intrusion, threat, and force, meaning

that they exist on a continuum (McGlynn et al., 2017). Therefore, in this project, the broad spectrum of TFSV behaviours was investigated.

Why Does TFSV Occur? Understanding Vulnerability

The online disinhibition effect, as posited by Suler (2004) and extended by Barak (2005), can help to explain why women are targets of TFSV. Factors like ease, accessibility, and anonymity of technological platforms, make individuals who desire power and control more likely to become perpetrators of TFSV (Barak, 2005; Suler, 2004). This notion is in line with research demonstrating that the presence of dark personality traits, including sadism, psychopathy, narcissism, and Machiavellianism, in which power and control are essential features, were predictive of the acceptance of TFSV-related myths including, "women should be flattered if a partner or ex-partner shows nude pics of her to some close friends" (Karasavva et al., 2022). This effect produces less inhibition on technological platforms, which would typically be present in in-person contexts (Barak, 2005; Suler, 2004). Women, in particular, may be targeted because they notably maintain decreased power in patriarchal societies (Hunnicutt, 2009). In turn, it follows that women in society who experience even less power are likely to become more heavily targeted than others. Hence, research on TFSV is greatly enhanced with the use of intersectionality as a theoretical foundation (Crenshaw, 1990; Cripps, 2022).

Intersectionality is a theory developed by Crenshaw (1990) that seeks to draw attention to the multiple vulnerabilities women face based on intersecting identities. These identities may include race, ethnicity, sexual orientation, age, perceived gender, ability, and socioeconomic status. In considering an intersectional lens in past TFSV research, TFSV does indeed appear to disproportionality affect young women and members of the LGTBQ+ community (Champion et al., 2024; Henry & Powell, 2018; Powell et al., 2018). Therefore, women, especially young,

disabled, poor, racialized, and 2SLGBTQIA+ women, are likely to be more vulnerable to TFSV than others.

Technology-Related Factors

Apart from demographic and intersectional considerations for women as victims, past research has begun to explore other individual, social, and community factors that might place women at risk for TFSV. However, what has largely been missing from this area are individual factors, outside of time spent online and the use of dating sites, specific to technology that could increase one's vulnerability (Cripps, 2022). In fact, after their research suggested that both student and socioeconomic statuses did not appear to be vulnerability factors for TFSV, Cripps (2022) recommended further exploring the technological world to examine what individual technology factors may increase vulnerability. Research on technology-related factors and vulnerability to cybercrime, in general, tends to use mixed gendered samples. It thus prevents an understanding as to what factors may uniquely put women at risk for TFSV. However, this literature provides a starting point for investigations of technology-related vulnerability in women victims of TFSV. It is also important to note that while technology-related factors tend to be behavioural in nature, this does not ascribe blame to the victims of cybercrime or TFSV. Instead, these individual factors are specifically capitalized on by perpetrators — there would be no cybercrime or TFSV without these exploitative actions.

Risk Perception and the Optimistic Bias

One identified vulnerability factor in this literature is risk perception, as researched for technological victimization in general (e.g., identity theft and credit card scams; Henson et al., 2013; Riek et al., 2016; Seijen, 2021). Risk perception refers to one's beliefs about the likelihood of being victimized through technology (Riek et al., 2016). Those with heightened risk

perception, that is, those who perceive more risk from technology use, tend to be less likely to experience technological crimes (as cited in Seijen, 2021). This work has also expanded to the optimistic bias, which refers to the tendency for individuals to believe that other people are more susceptible to crimes than they are (Weinstein, 1989). Researchers have found that those who score higher in this optimistic bias may be more vulnerable to victimization experiences from cybercrime (e.g., Rhee et al., 2005).

Research on in-person sexual violence has focused on risk perception and the associated optimistic bias (e.g., Brown et al., 2005; Chapin & Pierce, 2012; Gidycz et al., 2006). These results appear to model what has been indicated for technological victimization in general in that those with a low-risk perception and high optimistic bias appear to be more susceptible to sexual violence (Gidycz et al., 2006). However, interestingly, this research also showcases how victims of historical sexual violence may have increased risk perception due to these past experiences, perhaps highlighting a change that can occur in risk perception over time (Brown et al., 2005). Thus, it is unclear whether victims of TFSV may have a lower risk perception at their baseline compared to others, which may change after victimization experience(s).

Technological Literacy and Monitoring

Another factor to consider in the context of TFSV is technological literacy, or one's ability to effectively navigate technological environments (Rodríguez-de-Dios et al., 2018). Those with increased knowledge and skill in navigating technological spaces may be at an advantage in protecting themselves from TFSV (e.g., due to knowledge about security features like "blocking"). Indeed, research on general technological victimization has identified low technological literacy as a vulnerability factor (Graham & Triplett, 2017; Rodríguez-de-Dios et

al., 2018). Thus, low technological literacy could be a vulnerability factor for TFSV that has yet to be investigated.

A related concept to technological literacy that has featured primarily in the literature on cyberbullying in children and adolescents is parental monitoring. The research has indicated that parental monitoring (e.g., observing their child whilst online, enforcing time limits for technology use) can enhance child safety online (Elsaesser et al., 2017). However, this research has yet to examine whether this protective element is sustained into adulthood or with types of violence that are sexual in nature. Therefore, the TFSV literature could be enhanced by considering whether an absence of technological monitoring by parents during childhood may present as a vulnerability factor in adult women.

Problematic Technology Use

With every new edition, the Diagnostic and Statistical Manual for Mental Disorders (DSM) includes conditions that researchers and clinicians have identified as important areas for future research. One such condition added to the fifth edition of the DSM (DSM-5), remaining in the most recent edition (i.e., the DSM-5-TR), is internet gaming disorder (American Psychiatric Association [APA], 2013, 2022). This disorder is characterized by problematic gaming behaviours (e.g., preoccupation with games and withdrawal-like symptoms after games are removed; APA, 2013). Another condition that resembles this internet gaming disorder, is problematic internet use (also referred to as “internet addiction”), which also includes symptoms of preoccupation and withdrawal (Machimbarrena et al., 2021; Zsila et al., 2018). Both of these conditions together reflect problematic behaviours through technology more generally, and appear to be related to types of technological victimization (Machimbarrena et al., 2021; Richard et al., 2021; Zsila et al., 2018). Thus, these findings highlight the potential relationship between

problematic technology use and victimization through technology, including the potential for it to pose as a vulnerability factor for TFSV (Machimbarrena et al., 2021; Zsila et al., 2018). However, this has yet to be studied by TFSV researchers.

Popularity

Researchers have also documented popularity or status online as a vulnerability factor for cyberbullying (e.g., Longobardi et al., 2020; Ranney & Troop-Gordon, 2020). For instance, the number of people who follow adolescents' online activities (i.e., "followers") positively relates to victimization experiences (Longobardi et al., 2020; Ranney & Troop-Gordon, 2020). Although this work has extended to adult populations, particularly in the study of public figures or "influencers" (e.g., Cover et al., 2024; Fox et al., 2024), it is unclear whether the increased visibility that comes with being popular online could increase the exposure that other women have to TFSV. Thus, this is an additional potential vulnerability factor worth exploring.

Therefore, a diverse set of demographic and technological factors supported in other related areas of the literature require translation to TFSV research. These would assist researchers in understanding whether certain women may experience heightened vulnerability based on their demographic background and patterns of technology use.

TFSV and Psychological Symptoms

Outside of vulnerability factors, an area of TFSV research that is also expanding is the associated mental health consequences. Research examining potential outcomes of TFSV have indicated associations with symptoms of depression and anxiety (Cripps & Stermac, 2018; Douglass et al., 2018; Patel & Roesch, 2020; Snaychuk & O'Neill, 2020). However, much of this research has investigated the different forms of TFSV in isolation and, overall, there is a limited quantity of research to draw upon.

Technology-Facilitated Sexual Harassment

Investigations of TFSH and associated psychological symptoms are limited in the literature. Specific research to date focused on TFSH and mental health in adult women populations include studies by Iroegbu et al. (2024), Jannite et al. (2025), Oliver et al. (2024), and those reviewed by Gewirtz-Meydan et al. (2024). These findings indicate that TFSH behaviours may be associated with disordered eating symptoms, alcohol use, sexual functioning, anxiousness, depressive symptoms, and trauma symptoms in samples of adult women (Gewirtz-Meydan et al., 2024; Iroegbu et al., 2024; Jannite et al., 2025; Oliver et al., 2024). Other related research focuses on adolescent populations where TFSH has been associated with increased substance use (Reed et al., 2019; Ybarra et al., 2007), depression (Copp et al., 2021; Mitchell & Štulhofer, 2021; Reed et al., 2019), anxiety (Mitchell & Štulhofer, 2021; Reed et al., 2019), and eating symptoms (Romito et al., 2019). This showcases that this body of research is currently purely correlational (and cross-sectional), which prevents a broader understanding of the directionality of these relationships, and evidence is still mounting.

Cyberstalking

Much research on the psychological consequences of cyberstalking has focused on adult women populations, especially in the context of intimate partnerships and the workplace. This research, like investigations of other forms of TFSV, showcases the associations between cyberstalking and psychological symptoms, including depression and anxiety (Stevens et al., 2021; Worsley et al., 2017). In a study of more than 6,000 participants, researchers found that victims of cyberstalking rated their well-being as poorer than non-victims (Dreßing et al., 2014). Yet, due to the cross-sectional nature of this study, it is unclear whether these differences in well-being existed before the cyberstalking occurred. Cyberstalking has also been related to trauma

symptoms (Short et al., 2015). However, cyberstalking in the context of TFSV must be sexual in nature. Much of this body of research is conflated with methodologies that examine non-sexual cyberstalking, meaning that it is unclear if sexual cyberstalking is independently related to these psychological symptoms.

Image-Based Exploitation

One of the top areas of TFSV research where studies have centred on psychological consequences faced by women victims is in the realm of image-based exploitation. This area is rife with studies showcasing a link between TFSV and mental harm. For instance, in one survey study with over 850 respondents, 93% of "revenge porn" victims of different genders who reported having their images shared without consent experienced significant distress (Cyber Civil Rights Initiative, 2014). These results are in line with other research that also indicates a positive association between image-based exploitation and distress (e.g., Dardis & Richards, 2022). Furthermore, the non-consensual sharing of images has been associated with emotion dysregulation, depression, and trauma symptoms (Holladay, 2016). However, in most of these studies the data was collected from participants after their TFSV experience(s), preventing clarity as to whether in-the-moment distress and symptomology were captured. A key component of "revenge porn" has also been emphasized in past research, where the perpetrator is engaging in the act with a clear malicious intent to cause distress (Walker et al., 2019). Overall, McGlynn and Rackley (2017) argue that psychological consequences of image-based exploitation are reflective of victims' loss of body autonomy, privacy, trust, and dignity, which is in line with other research conducted by this group (e.g., McGlynn et al., 2021).

Technology-Facilitated Unwanted Sexual Experiences

Given the dearth of research on technology-facilitated unwanted sexual experiences in person generally, few investigations center on this form of TFSV and its association with psychological symptoms. Most of this research originates from dating application-related sexual assault, which has indicated that victims are likely to report mental health concerns (Valentine et al., 2023). However, as previously noted, this form of TFSV is arguably the most like in-person sexual violence, which has been a research topic for decades. Furthermore, in-person sexual violence is a significant predictor of psychological problems in women (for a review, see Dworkin et al., 2017). Despite this evidence, it is unclear whether unwanted sexual experiences facilitated through technology may alter the distress that victims experience. For example, the violation in both the technological space and real-world setting may cause distressing effects to compound. This would certainly benefit from more exploration.

Gender and Sexuality-Based Harassment

Lastly, as noted previously, research on gender and sexuality-based harassment has typically focused on gaming environments. Indeed, research on potential psychological consequences has also been specific to this area. For instance, in one unpublished qualitative thesis, researchers found that women often felt a sense of fear in gaming environments that caused them to modify their behaviours, including using gender-neutral pronouns, to avoid being targeted (Graso, 2016). Interestingly, research in this area has highlighted not only the psychological effects of misogyny in gaming environments for women but also the barrier this type of harassment creates that prevents them from gaining any of the positive psychological benefits of gameplay (e.g., cooperation, social interaction; Kuss et al., 2022).

In terms of sexuality-based harassment on technological platforms, it has also been less studied than other forms of TFSV. However, a study by Gámez-Guadix and Incera (2021) indicated that sexuality-based harassment was associated with anxiety and depression in a sample of adolescent sexual minorities with the causal direction of this relationship being unclear. Other researchers have also studied young adults who identified as sexual minorities, and heterosexist experiences online were related to poor mental health (Chan, 2022). While heterosexist experiences included sexuality-based harassment (i.e., insults or derogatory comments received about their sexuality), this study also measured exposure to other aspects of the technological world (e.g., online advertisements), making it difficult to discern whether associations may be supported in isolation.

Limitations of Past Research on Psychological Symptoms and TFSV

Researchers investigating TFSV have focused on psychological consequences to elucidate the harmful effect that TFSV may have on victims. However, in outlining the different research studies that have focused on TFSV and its various forms, it is evident that this body of research is purely retrospective and correlational, as it currently stands. This means that, though these research findings provide a solid foundation for viewing TFSV as potentially harmful to victim's mental health, it has not yet further tested this notion. Here, the literature on in-person sexual violence can be drawn upon, where prospective designs indicate that in-person sexual violence likely has a cause-effect relationship on symptoms of depression and anxiety (e.g., Brunton & Dryer, 2022; Chiodo et al., 2009; Dahlqvist et al., 2016). It is also unknown whether psychological distress may serve as a vulnerability factor for TFSV, as has been noted in the literature on in-person sexual violence (e.g., Krahé & Berger, 2017). Due to ethical concerns regarding the use of experimental research in this area (i.e., exposing participants to sexual

violence), naturalistic prospective designs could be the next step in testing these hypotheses. Specially, data that can be collected in real-time, as women experience TFSV, through research designs like ecological momentary assessment (EMA), would provide researchers with more clarity as to the potential relationships between TFSV and psychological distress. This design is used in Study Two of this dissertation.

Overall, the major gaps in this area of research are a lack of studies examining TFSV in general and an overall absence of longitudinal or prospective designs to help investigate causality. These gaps present as an issue because it is unclear whether these variables change over time in tandem. Thus, it prevents understanding as to whether temporal relationships may exist between TFSV and psychological distress. Prospective designs can be quite powerful compared to cross-sectional designs because they also provide information about intraindividual differences. Information at the individual level is helpful to collect because it can allow researchers to discern whether changes observed in participants over time may be due to variations in other variables (e.g., TFSV). Thus, the absence of any prospective designs is a significant gap in the literature that Study Two in this project sought to address.

Coping with TFSV

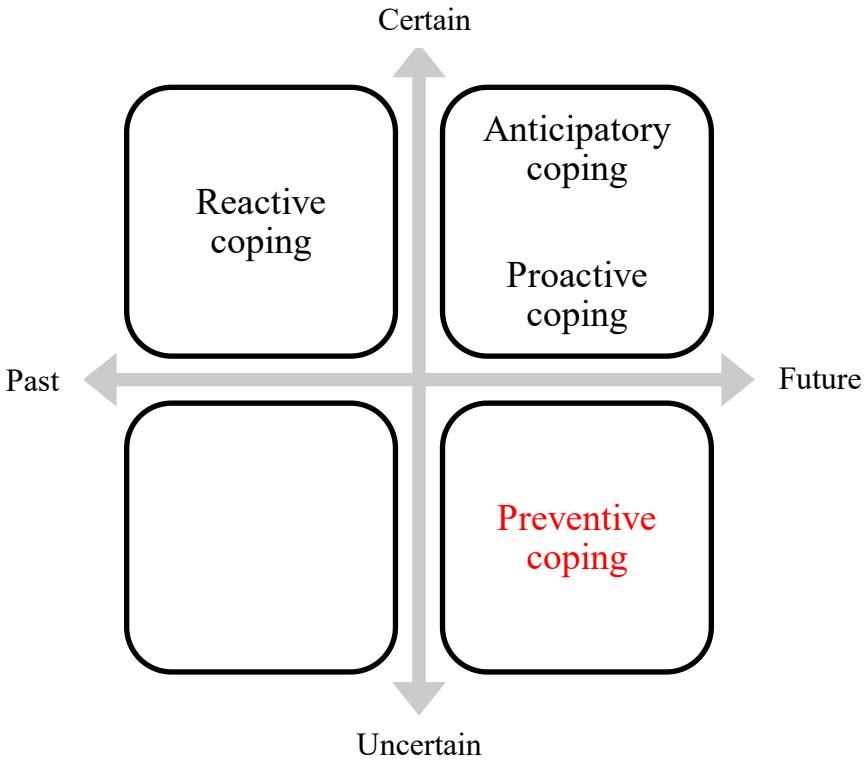
As in other portions of the literature on TFSV, the literature on how victims cope with potential psychological consequences is also currently limited. Coping refers to strategies that are employed to deal with stressors and, in the case of TFSV, would refer to the methods enacted by victims to cope with it and its consequences (e.g., distress; Lazarus & Folkman, 1984). However, preliminary research in this area suggests that victims will use problem-focused coping, which reflects a problem-solving approach (e.g., reporting the perpetrator of TFSV to online authorities), emotion-focused coping, which refers to strategies that assist with emotion

regulation (e.g., distracting oneself from the situation), or social-relation-focused coping, which relies on social support networks to help cope with the stressor (e.g., talking to friends or family about the TFSV; Bates, 2017; Fox & Tang, 2017; Siegel et al., 2024). Due to the recency of these investigations, the degree to which these strategies are helpful and the degree to which maladaptive coping strategies may be used, is unknown. As has been previously noted, the potential for victims to engage in "maladaptive" coping strategies or strategies that lead to negative consequences should not be viewed as ascribing blame to victims for the TFSV they experience. This responsibility should remain in the hands of the perpetrators and the systems that foster and enable them.

Although these different coping strategies (i.e., problem-focused, emotion-focused, social-relational-focused) have been explored in the TFSV literature, they ultimately can be redefined as a group of strategies known as reactive strategies, strategies employed in the face of an active stressor (i.e., TFSV; Schwarzer & Luszczynska, 2008). However, Schwarzer and Luszczynska (2008) offer a theoretical distinction between these reactive coping strategies and anticipatory, preventive, and proactive coping (see Figure 2). Though there are many helpful models of stress and coping, such as Lazarus and Folman's (1984) model briefly outlined above, this distinction offered by Schwarzer and Luszczynska (2008) is helpful in the current context because of its conceptual similarity to terms (e.g., "risk avoidance") that have been used in the in-person sexual violence literature, as will be discussed.

Figure 2

A Model of Coping by Schwarzer and Luszczynska (2008)



Whereas reactive coping focuses on past and present incidents, anticipatory, preventive, and proactive coping refer to strategies employed for future stressors (Schwarzer & Luszczynska, 2008). Anticipatory strategies deal with stressors that will occur in the near future, and preventive strategies deal with stressors that lie in an uncertain future. On the other hand, proactive coping refers to strategies that facilitate future goals and growth, where stress may be encountered but no threat is perceived. Preventive coping not only targets stressors in the future but also attempts to reduce the risk or severity of these stressors. Hence, Schwarzer and Luszczynska (2008) offer a theoretical framework for understanding what types of coping strategies (i.e., those dealing with the future) have not yet been explored in TFSV research.

Preventive Coping and TFSV

Out of the future-oriented coping strategies, preventive is arguably the most central to understanding 1) how victims of TFSV may reduce the risk of future TFSV, 2) how victims may reduce potential compounding effects of multiple TFSV incidents on their psychological well-being, and 3) more long-term behavioural changes experienced because of TFSV.

Risk Avoidance Strategies

Preventive coping is reflected in the literature on in-person sexual violence, where there has been much focus on "risk avoidance strategies," as mentioned above (Ullman et al., 2018). This research highlights the behavioural changes that may occur after one's experience with sexual violence (e.g., engaging in self-defence training, locking one's vehicle immediately after entering it) that serve to protect one's mental health by mitigating future risk (Pinciotti & Orcutt, 2018). Furthermore, some research emphasizes the empowering effect that these behavioural strategies (e.g., self-defence training) can have on one's recovery from sexual violence (Pinciotti & Orcutt, 2018; Ullman, 2007; Ullman et al., 2018). However, feminist researchers voice their concerns about these behavioural strategies in that they often limit women's freedoms in society (Brownmiller, 1993; Wannamaker, 2017). This literature outlines how the need for women victims of sexual violence to engage in risk avoidance strategies to prevent future violence is inherently harmful not only for one's mental health and well-being but also for the rights and freedoms of women as a whole (Ullman et al., 2018). Thus, although some victims may engage in risk avoidance strategies that they find empowering and reflect their active resistance to sexual violence, it is clear that the onus should not be on women to actively prevent or resist their own sexual victimization (Basile, 2015). Therefore, this literature can be drawn upon to highlight the importance of researching risk avoidance strategies in TFSV because of the potential for these to

be both empowering and detrimental to the psychological well-being of women victims of TFSV.

Risk Avoidance Strategies Used for Technology

Though risk avoidance strategies have been a topic of research in the in-person sexual violence literature, only one identified study has examined it across the TFSV spectrum of behaviours. This research by Champion et al. (2022), which qualitatively investigated the impacts of TFSV on victims, noted some changes in online behaviour (e.g., not engaging with strangers) after TFSV experiences that could be classified as risk avoidance strategies. However, this research was tailored towards the effects of TFSV in general, rather than focusing specifically on the risk avoidance strategies utilized by women victims, which prevents a broader understanding of such strategies.

A few other studies have examined risk avoidance strategies in the realm of technology-facilitated violence (i.e., violence that is inclusive of different behaviours, not solely sexual) in adult populations. These strategies include self-censoring, removing online profiles, and limiting communication with others online (Veletsianos et al., 2018). Chadha et al. (2020) noted in their qualitative study investigating harassment against university women that women would not post anything controversial or revealing online to protect against harassment. Veletsianos et al. (2018) emphasize how this type of restricted technological participation can place women at a disadvantage compared to men in both academic and career development. Hence, these technology-based risk avoidance strategies, though protective, can also serve to perpetuate negative long-term consequences for women.

Cyberbullying. The literature on cyberbullying in child and adolescent populations is one of the most extensive areas of cyber-related psychological research and, consequently, covers

risk avoidance strategies that children and adolescents may use. This research indicates that children and adolescents will often avoid the use of technology, enhance their security (e.g., by not providing identifying information), and seek out education about platforms (e.g., which websites are not safe to use; Parris et al., 2012; Parris et al., 2014). However, in a study by Parris and colleagues (2012), some high school students reported that there was nothing they could do to prevent cyberbullying, reflecting their eventual disengagement in any risk avoidance strategies.

In sum, the literature on in-person sexual violence and technology-facilitated violence, including cyberbullying, can provide a window into the potential experiences of women victims of TFSV as it pertains to risk avoidance strategies. These strategies could be explored to deduce the long-term consequences that women may face while protecting their psychological well-being after TFSV.

Limitations of Past Research on Coping and TFSV

In their review, Henry and Powell (2018) write about the paucity of qualitative research on TFSV, which limits women in sharing their experiences. Regarding risk avoidance strategies, no research has yet focused on this topic for any of the subcategories of TFSV or TFSV in general. Hence, this remains a major gap in understanding TFSV and coping. As has been modelled in the in-person sexual violence literature, qualitative research, which seeks to uplift victims' voices, is a good fit for this topic, given its exploratory nature and the need for more knowledge about victims' experiences with coping.

Current Studies

Due to the aforementioned gaps in the TFSV literature, this dissertation consisted of three studies that sought to 1) describe demographic and technology-related factors that may increase

women's vulnerability to TFSV, 2) examine potential temporal relationships between TFSV and women's psychological distress, and 3) better understand women's experiences coping with TFSV through risk avoidance strategies. The first study employed a survey-based approach to examine women's vulnerability. The second study used ecological momentary assessment (EMA) to capture the real-time experiences of women. The third study utilized a qualitative approach and involved interviews with women victims of TFSV. The terms "woman" or "women" across these studies were conceptualized as socially constructed. As a result, individuals who self-identified as women at the outset of recruitment (i.e., when responding to our advertisements for "women") were the focus. Furthermore, woman gender identity was not viewed as mutually exclusive of other gender identities, meaning that women in this research may also have identified as other gender identities (e.g., man, non-binary).

Study One: Survey on Vulnerability Factors

The main objective of Study One was to better understand factors that may increase women's vulnerability to TFSV. Thus, for Study One, the main research question was: Are there demographic or technological factors related to a higher likelihood of experiencing TFSV for women?

Hypotheses

Based on past research and theory (e.g., Crenshaw, 1990; Cripps, 2022), sexual and racial minority statuses, as well as having a disability, young age, or low socioeconomic status, were hypothesized to be related to more TFSV experiences. For technology-related factors, risk perception, parental monitoring, and technology literacy were hypothesized to be negatively associated with experiences of TFSV (e.g., Elsaesser et al., 2017; Gidycz et al., 2006; Graham & Triplett, 2017). In contrast, the optimistic bias, problematic technology use, and popularity were

hypothesized to be positively associated with experiences of TFSV (e.g., Cover et al., 2024; Gidycz et al., 2006; Machimbarrena et al., 2021).

Methodology

Participants

Women participants (N = 328) were recruited through the Sona system at Lakehead University, which provides students with bonus points in psychology courses for participating in research studies. Note that women were asked to self-select in response to the advertisement (i.e., "*Do you identify as a woman, and do you use technology?"*). Participants were remunerated with 0.5 bonus points for this study.

Exclusions

Of the total sample (N = 328), forty-eight participants were excluded due to responding on less than 20% of the primary study scales. A further ten were excluded due to not completing all TFSV-related questions (i.e., the primary dependent measure). Finally, due to possible careless or non-purposeful responses, two more participants were excluded after achieving scores higher than three on the Personality Research Form Infrequency Scale (see more information about this scale is in the Measures section). Therefore, the final sample size for this study was 268 participants. This final sample size (N = 268) is larger than was estimated (N = 210) from G*Power 3.1 for a two-tailed independent samples t-test with an alpha level of .05, power level of .95, and effect size of .50 (Faul et al., 2009).

In Table 1, participant (N = 268) demographics are presented. Note that comparisons between the included and excluded participants on demographic factors (i.e., age, education level, racial minority status) revealed no significant differences (p > .05).

Table 1

Participant Demographic Information (N = 268)

Characteristic	Count (% of sample)
Mean Age (*SD*)	22.49 (6.45)
Gender [a]	
Genderfluid	14 (5%)
Nonbinary/Genderqueer/Gender nonconforming	3 (1%)
Questioning	4 (2%)
Transgender	2 (1%)
Man	1 (<1%)
Woman	250 (93%)
Sexual Orientation[a]	
Asexual	9 (3%)
Bisexual	47 (18%)
Heterosexual	187 (70%)
Lesbian	3 (1%)
Pansexual	10 (4%)
Queer	6 (2%)
Questioning	8 (3%)
Prefer not to answer	6 (2%)
Racial, Ethnic and/or Cultural Background[a]	
African	14 (5%)
Black	7 (3%)
Caribbean	6 (2%)
East/Southeast Asian	12 (5%)
Hispanic/Latinx	3 (1%)
Indigenous	27 (10%)
Middle Eastern	4 (2%)
South Asian	8 (3%)
White	197 (74%)
Mixed	10 (4%)
Prefer not to answer	2 (<1%)
Background not captured above	9 (3%)
Disability Status	
Yes	31 (12%)
No	226 (84%)
Highest Level of Education Completed	
Highschool completed	97 (36%)

Some college or technical school training	6 (2%)
College or technical school completed	32 (12%)
Some undergraduate training	111 (41%)
Undergraduate degree completed	12 (5%)
Some graduate or professional degree training	1 (<1%)
Graduate degree completed	8 (3%)
Student Status[a]	
Full-time	242 (90%)
Part-time	26 (10%)
Domestic	248 (93%)
International	19 (7%)
Mean Current Grade Point Average (*SD*)	78.59 (10.62)
Employment Status	
Full-time	23 (9%)
Part-time	160 (60%)
Unemployed	84 (31%)
Family of Origin Income	
Under $10,000	9 (3%)
$10,001-$24,999	16 (6%)
$25,000-$49,999	22 (8%)
$50,000-$74,999	43 (16%)
$75,000-$99,999	37 (14%)
$100,000-$124,999	35 (13%)
$125,000-$149,999	10 (4%)
$150,000-$174,999	23 (9%)
$175,000-$199,999	11 (4%)
$200,000-$249,999	12 (5%)
$250,000-$299,999	4 (2%)
$300,000 or more	10 (4%)
Marital Status	
Single	131 (49%)
Married	27 (10%)
Separated/divorced	6 (2%)
Committed relationship	101 (38%)
Open relationship	1 (<1%)
Prefer not to answer	2 (<1%)

[a]Participants could select multiple options, so percentages do not sum to 100%.

Procedure

This research, as well as the other studies in this project, involved the use of human participants and therefore, Lakehead University's Research Ethics Board (REB) reviewed the protocol before data collection to ensure full compliance with the Tri-Council Policy Statement 2 (TCPS-2). Once approval was obtained from the REB, data collection was initiated. Data collection for this study occurred on the online SurveyMonkey platform (see Appendices A, B, and C for the participant information letter, consent form, and debriefing form).

Measures

Technology Use Questionnaire

Similar to past research on TFSV (e.g., Powell & Henry, 2019), participants were provided with questions about their technology use (see Appendix D). Questions targeted the types of technological platforms they regularly use (e.g., social media sites, email, phone calling, SMS text messaging, dating applications, game platforms), their daily use of these types of technological platforms, reasons for using platforms (e.g., work, romantic connection), and the people that they usually connect with on these platforms (e.g., strangers, friends, family members). Their time spent using technology was measured through asking, "How many hours per day, on average, would you estimate that you use the technological platforms/functions that you selected in total? (best estimate)." Participants were able to answer in numerical form up to 24 hours of use. The types of games that participants play were also queried based on the genre categories outlined by Elliott and colleagues (2012).

TFSV

TFSV experiences were captured using the TFSV Victimization Scale (TFSV-V) developed by Powell and Henry (2019; See Appendix E). This scale contains 22 items and was

created by the authors to capture four out of the five domains of TFSV. As a result, in this study, one item was modified on the scale to capture broader cyberstalking behaviours (i.e., outside of intimate partnerships), which was still under investigation at the time of scale development (Powell & Henry, 2019). Furthermore, an additional item on being pressured to send nude images/videos was added based on the work of Snaychuk and O'Neill (2020). A further item ("Gender-based offensive and/or degrading messages, comments or other content in the virtual world") was omitted based on perceived overlap with another item ("Gender-based offensive and/or degrading messages, comments, or other content"), and other minor language changes were made to increase clarity. Developed through the guidance of several experts in the field of sexual violence, Powell and Henry (2019) cite the TFSV-V as promoting a high face validity. The internal consistency of the TFSV-V has yielded an alpha of .93 (Powell & Henry, 2019). Though developed recently, the scale has shown strong psychometric properties (e.g., Patel & Roesch, 2020; Snaychuk & O'Neill, 2020). Participants were asked about how often they experienced any of the TFSV events outlined in the TFSV-V Scale over the past six months (i.e., *daily*, *weekly*, *monthly*, *less than once a month*, or *never*). See Table 3 for the internal consistency of this measure in the current study.

Vulnerability Factors

Demographics. Demographics on each participant were collected related to gender, sexual orientation, relationship status, age, education level, socioeconomic status (as reflected through a proxy ordinal measure of family of origin income), work status, disability status, ethnic background, and grade point average (see Appendix F). These items targeted descriptive information about the sample, and others, based on past research, were used in analyses to identify potential demographic-related vulnerability factors to TFSV. As outlined in Appendix F,

question one queried participant age (numerical format) and questions five (yes/no format) and thirteen (yes/no format) targeted racial minority and disability statuses (accordingly). Responses to question three were modified to reflect sexual minority status by categorizing women who solely selected "heterosexual" as "no" and all others (barring those who did not answer) as "yes." Question eleven was used to measure socioeconomic status.

Risk Perception and the Optimistic Bias. To measure risk perception and the optimistic bias as vulnerability factors, van Schaik et al.'s (2018) risk perception measure for Facebook-specific hazards was modified for use. In this instance, optimistic bias references a person's view that technological risks happen more to others than to them. Van Schaik et al.'s (2018) measure includes items that examine the perceived risk of not having privacy and security settings and the perceived risk of not controlling information-sharing. To reflect the dimensions of privacy, security, and information-sharing on other types of technological platforms and devices outside of Facebook, additional items were added for a total of 16 items. Items were first posed to participants to assess the risk they perceived to themselves (Risk Perception to Self), and then the items were repeated to measure the perceived risk to others (Risk Perception to Others). The optimistic bias was calculated by subtracting one score from another. Participants responded to these items on a 7-point Likert-type scale from poses *no risk* to *great risk*. See Appendix G for more information. The psychometric properties of this measure have not yet been reported in past research. Table 3 showcases the performance of this measure in the current study.

Technological Literacy. The Digital Literacy Scale developed by Rodríguez-de-Dios et al. (2016) was used in this study to capture technological literacy (see Appendix I). This scale measures six subdomains, including technological, personal security, critical, devices security, informational, and communication skills. It includes 29 items on a 5-point Likert scale, which

ranges from *strongly agree* to *strongly disagree*. The researchers found that the scale had moderate to high internal consistency (i.e., α = .63 to .75) in their research, except for the communication skill domain (α = .46; Rodríguez-de-Dios et al., 2016). Further validation work has yet to be completed on this scale. The current study used a 27-item version of this scale. One item ("I know the consequences of illegal downloading of music and movies") was erroneously omitted from the survey for participants, and due to a low item-total level correlation and the possibility that responding may have depended on a third variable, item 29 ("No matter with who I communicate: emojis are always useful") was also removed. See Table 3 for the internal consistency of this measure in the current study.

Parental Monitoring. Parental monitoring items were taken from Livingstone and Helsper's (2008) work on parental mediation. Participants reported (i.e., yes/no) whether their parents enacted certain restrictions until age 18. Using factor analysis, Livingstone and Helsper (2008) identified four different subdomains of their scale, including active co-use (i.e., parents using technology with their child), technical restrictions, interaction restrictions (i.e., regulating relational aspects of technology like correspondence through email), and overall monitoring. The correlations for these subdomains ranged from .30 to .63. In another content validation study of this measure, researchers indicated that items fell within what they termed "rule-setting restrictions," "monitoring restrictions," "technical restrictions," and "parent-initiated enabling" subdomains that are similar to what was reported by Livingstone and Hesper (2008; Kuldas et al., 2021). All the original items were used in this study. However, one additional item (i.e., "blocked your use of…") was added, and another item was deleted (i.e., "…filtering software") to reflect the current controls that are available to parents (see Appendix H). Item wording was also adapted to the past tense and to capture participants' perspectives, rather than their parents'

perspectives, for the purposes of this study. See Table 3 for the internal consistency of this measure in the current study.

Problematic Technology Use. The Problematic Internet Use Questionnaire Short-Form developed by Demetrovics et al. (2008) was used to measure problematic technology use (see Appendix J). This questionnaire covers elements of difficulty controlling use, neglect of daily activities, and obsessive thoughts related to technology. This questionnaire has shown high reliability and validity (Demetrovics et al., 2016). Specifically, for reliability, the subdomains ranged in correlations from .80 to .94. See Table 3 for the internal consistency of this measure in the current study. To test for criterion validity, the researchers also compared the subdomains with known associates of problematic internet use, including gender, age, daily internet use, grade point average, self-esteem, depressive symptoms, and preferred online activities. The researchers found significant correlations for daily internet use, grade point average, self-esteem, and depressive symptoms, as expected.

Popularity. Items were also created in this study to measure popularity in technology (i.e., on social media and in email, texting, phone calls, and video gaming). However, due to less than 50% of the sample reporting video game play, the related item was omitted as a proxy item for popularity. A final ranked popularity variable that consisted of the sum of the rank orders of the four proxy items was created. These items included the highest number of followers on any social media platform, and daily text messages, phone calls, and emails received (see Appendix K). For each item, the values were rank ordered, with a value of one assigned to the participant with the lowest number. In cases of ties, mean values were assigned. These ranks were then summed across participants to achieve a final aggregated ranked popularity score. Since popularity is a socially derived concept, rank-order scaling allowed for a more objective

characterization of group status. It also minimized the effect of unequal intervals between these ranks.

Response Style

Non-purposeful responding was also examined in this study to detect and eliminate a potential source of test-taking error. The Infrequency Scale developed and used by Jackson (1984) in his Personality Research Form was used to evaluate this response style (see Appendix L). This measure contains 16 items on dichotomous true and false scales. It assesses careless or non-purposeful responding by using items that are infrequently endorsed in the general population, such as, "I have never bought anything in a store". An initial version of the Infrequency Scale had an internal consistency of .43, and scale items had mean factor loadings of .50 (Helmes & Jackson, 1977). These psychometric properties align with what is expected from this scale, given the low endorsement rate of items.

Statistical Analyses

Descriptive statistics were used in this study to examine participants' use of technology and experiences with TFSV. Measure characteristics are also presented for each of the primary scales. Three bivariate analyses were conducted to answer whether there are demographic or technological factors that may increase women's vulnerability to TFSV: independent samples *t*-tests, Pearson product-moment correlations, and Spearman's rank order correlation. Specifically, independent *t*-tests were used to compare TFSV means between minority statuses in women for the demographic variables of sexual minority status, racial minority status, and disability status. Pearson product moment correlations were used for all continuous demographic and technological variables, which included age, socioeconomic status, time spent using technology, risk perception, optimistic bias, technological literacy, parental monitoring, and problematic

technology use. Spearman's rank-order correlation was used for the ordinal technological variable of popularity. A univariate approach to data analysis was chosen given the univariate, rather than multivariate, nature of the research questions (Huang, 2020; Huberty & Morris, 1989).

Missing data were subjected to pairwise deletion across these analyses. Due to conducting numerous analyses, thereby increasing the risk of Type I error, a correction was applied across analyses at the .02 alpha level. This alpha level was chosen to balance overly conservative approaches (e.g., Bonferroni) that may inadvertently increase Type II error with the liberal maintenance of an alpha level of .05 that may increase Type I error after multiple analyses.

The final sample ($N = 268$) was composed of women ($n = 245$; 91%) and participants who fell under a broader gender-diverse umbrella ($n = 23$; 9%). To examine whether the solely women and gender-diverse subgroups might be viewed as being sampled from the same population, these subgroups were compared on several demographic factors, including age, racial minority status, and education, as well as TFSV. Independent samples *t*-tests and chi-square analyses indicated a significant difference ($p < .05$) between subgroups in only the age variable. The gender-diverse subgroup was significantly younger ($M = 20.78$, $SD = 3.13$) than the subgroup of solely women ($M = 22.65$, $SD = 6.65$). Given the larger proportion of women ($n = 245$) compared to gender-diverse individuals ($n = 23$) and the larger range of ages in women, as illustrated by the higher standard deviation score, medians were also used to assess equivalency between these subgroups. Median ages across both subgroups were 20. Therefore, due to several indications of equivalency between the subgroups (i.e., in racial minority status, education, TFSV, and median age), these subgroups were collapsed in the current study analyses. However,

secondary analyses were also performed separately for the gender-diverse subgroup to investigate any possible differences further.

Assumption Testing

Prior to assumption testing, all item-level data were inspected for accuracy, with visual inspection and descriptive statistics revealing that all entries were plausible. After participant exclusions, a missing values analysis was conducted in SPSS to identify any patterns in missing data (IBM Corporation, 2022). Across primary measure items (aside from ranked popularity items, which were expected to have missing data related to participant use/non-use of platforms), there was less than 5% missing data, and only one participant had more than 5% missing (i.e., 9%). This participant did not complete the nine items from the Digital Literacy Scale and one from the Parental Monitoring measure. Therefore, they were omitted from those related analyses using the missing data strategy outlined above. Otherwise, given the large dataset, this pattern of missing data was in line with what would be expected (Tabachnick & Fidell, 2018).

An examination of the TFSV variable, the primary dependent variable (DV) in this study, was first undertaken due to overlapping assumptions across independent-sample *t*-tests and Pearson correlation analyses that are DV-specific. Descriptive statistics and visual inspection of a scatterplot revealed a moderate-to-substantial positive skew (2.31) and positive kurtosis (7.72) of the TFSV variable. Additionally, three univariate outliers were identified by examining standardized scores in excess of 3.29 (Tabachnick & Fidell, 2018). The data from these individuals were re-inspected for accuracy, and each was deemed plausible. High levels of skewness and kurtosis were also maintained when TFSV scores were inspected across the independent variable (IV) groups for sexual minority, racial minority, and disability statuses. Thus, in addition to indicating a violation of the assumption for the Pearson correlation regarding

a normally distributed dependent variable, this also violated an assumption for independent *t*-tests that the dependent variable is normally distributed across IV groups.

As recommended by Tabachnick and Fidell (2018), a log transformation of the TFSV variable was employed to produce more normally distributed data. After the transformation, skewness (0.02) and kurtosis (-1.03) were reduced, and univariate outliers were no longer identified, suggesting the aims of the transformation were met. Reduced skewness and kurtosis scores were also present across the IV groups mentioned above. As a result, the log-transformed TFSV variable was utilized in the independent *t*-tests and Pearson correlations conducted in this study. However, due to the robust nature of the Spearman correlation to deviations of normality, and the absence of any associated assumption in this respect or in respect to outliers, the original TFSV scale was used in this case.

Independent t-Tests: Further Assumption Testing

Three analyses were conducted involving the demographic grouping variables of sexual minority status, racial minority status, and disability status to examine vulnerability to TFSV. In these cases, the IV were categorical (yes/no), and the dependent variable (TFSV) was continuous and log-transformed (as outlined above). There were also independent observations across the groups of each IV. As indicated above, the log-transformed TFSV dependent variable was also normally distributed for each independent group, and no univariate outliers were identified. For homogeneity of variance, Levene's Test for Equality of Variances was not significant ($p > .05$) across the IV groups, indicating that the assumption of equal variances was also met.

Pearson Correlations: Further Assumption Testing

In addition to univariate outlier detection and normality for the TFSV log-transformed dependent variable, as outlined previously, assumption testing for Pearson correlation was

undertaken to examine normality and univariate outliers in IVs, multivariate outliers, linearity, and homoscedasticity. Histograms were visually inspected along with skewness and kurtosis scores when testing for normality, and standardized z-scores were used to identify univariate outliers. Multivariate outliers were examined using Mahalanobis Distance (MD), with an alpha level of .001 for the probability estimate compared to a chi-square distribution (Tabachnick & Fidell, 2018). Scatterplots were used to visually inspect for linearity, and residual scatterplots were used to inspect for homoscedasticity.

Age. When examining standardized z-scores for the age variable, five were in excess of 3.29 (Tabachnick & Fidell, 2018), indicating univariate outlier status. Skewness (2.36) and kurtosis (5.85) scores also revealed a highly positively skewed distribution. As a result, an inverse transformation of the age variable was undertaken, as recommended by Tabachnick and Fidell (2018), resulting in a distribution closer to normal and no identifiable univariate outliers. Hence, this inverse-transformed age variable was utilized in the Pearson correlation analysis.

With the inverse-transformed age variable, no cases achieved MD probability estimates below .001, indicating an absence of multivariate outliers. Upon scatterplot visual inspection, there also appeared to be a linear relationship between the inverse-transformed age variable and the log-transformed TFSV variable. Upon visual inspection of the residual scatterplot, there was also no evidence of heteroscedasticity.

Socioeconomic Status. Although socioeconomic status (SES) is considered an ordinal variable, Sullivan and Artino (2013) assert that parametric tests like the Pearson correlation tend to be more robust than nonparametric alternatives and can be useful for ordinal scaled data. Hence, the current study examined the relationship between SES and TFSV using a Pearson correlation. As expected, no univariate outliers were identified within the SES variable, and it

appeared normally distributed under visual inspection. There was also an absence of multivariate outliers and no evidence of non-linearity or heteroscedasticity. Thirty-four (13%) participants reported that they did not know or preferred not to answer the associated question.

Time Spent Using Technology. Using standardized z-scores and MD, three univariate and multivariate outliers were identified for the time spent using technology variable, which was within the bounds of a few expected outliers in a large dataset (Tabachnick & Fidell, 2018). However, with further inspection, these represented three participants who reported the highest daily use of technology (i.e., 16, 17, and 18 hours). Two of these participants had relatively typical TFSV experiences (i.e., total scores of 1 and 3 when compared to a mean of 5.80 and standard deviation of 7.19). In contrast, the third had the highest TFSV score reported in the dataset (i.e., a score of 48). Although these scores were viewed as within the realm of possibility, to investigate the validity of such scores further, scores in problematic technology use and popularity were cross-examined, given the hypothesized relationship between these variables. These participants received scores of 12, 16, and 18 on problematic technology use, within one standard deviation of the mean for this measure (M = 16.41, SD = 4.50). In terms of popularity, all three participants had scores above the mean, which was hypothesized, and two were higher than one standard deviation from the mean. Given the possibility that these represent unique cases in the dataset that are still within the population of interest, these cases were retained for analysis. However, a correlation analysis was also run after the deletion of these cases to examine the influence they may have had on the result.

Regarding normality, histogram visual inspection and skewness and kurtosis scores revealed no deviation. There was also no evidence of a non-linear relationship or

heteroscedasticity when visually inspecting the associated scatterplots between time spent using technology and the TFSV log variable.

Risk Perception. Using standardized z-scores, histogram visual inspection, and skewness and kurtosis scores, no univariate outliers or deviations from normality were observed for the risk perception variable. Furthermore, through MD, no multivariate outliers were identified. There was also no evidence of a non-linear relationship or heteroscedasticity when visually inspecting the scatterplot or residual scatterplot, respectively.

Optimistic Bias. Using standardized z-scores and MD, three univariate and multivariate outliers were identified for the optimistic bias variable, which were, again, within the bounds of a few expected outliers in a large dataset (Tabachnick & Fidell, 2018). These represented two participants who reported the highest optimistic bias (i.e., with scores of 89 and 48) and one with the lowest (i.e., with a score of -62). After examining the scores that these participants obtained on risk perception to self and others (the measures for which the optimistic bias score is derived), it was discovered that the participant who had a score of 89 had rated nearly all items as posing a great risk to themselves. In contrast, they rated zero items as posing any sort of risk to others. Given the lack of congruency between these ratings and reduced confidence in the accuracy of these data, this participant was omitted from the associated analysis.

For the two remaining participants, one had a relatively high TFSV score (i.e., a score of 26; see Table 3 for scale mean and standard deviation) to accompany their score of 48 for the optimistic bias, while the other reported no TFSV experiences. Although these scores were viewed as within the realm of possibility, to further investigate the validity of such scores, scores in technology literacy were examined, given the hypothesized relationship between these variables. The participants received scores of 108 and 95 in technological literacy, both within

and below one standard deviation of the means for this measure (M = 109.08, SD = 13.87), respectively. Given the possibility that these represent unique cases in the dataset that are still within the population of interest, these cases were retained for analysis. However, a correlation analysis was also run after the deletion of these additional cases to examine their influence on the result.

In terms of normality, histogram visual inspection and skewness scores revealed no deviation. The kurtosis score (6.43) was relatively high for the optimistic bias variable. However, it was still within a broader acceptable range, as higher kurtosis levels departing from zero are thought to have less impact in larger datasets (Tabachnick & Fidell, 2018). When visually inspecting the associated scatterplots between the optimistic bias and the TFSV log variable, there was no evidence of a non-linear relationship or heteroscedasticity.

Technological Literacy. Using standardized z-scores, histogram visual inspection, and skewness and kurtosis scores, no univariate outliers or deviations from normality were observed for the technological literacy variable. Furthermore, through MD, no multivariate outliers were identified. There was also no evidence of a non-linear relationship or heteroscedasticity when visually inspecting the scatterplot or residual scatterplot, respectively.

Parental Monitoring. Similarly, using standardized z-scores, histogram visual inspection, and skewness and kurtosis scores, no univariate outliers or deviations from normality were observed for the parental monitoring variable. Furthermore, through MD, no multivariate outliers were identified. There was also no evidence of a non-linear relationship or heteroscedasticity when visually inspecting the associated scatterplots.

Problematic Technology Use. Finally, using standardized z-scores, histogram visual inspection, and skewness and kurtosis scores, no univariate outliers or deviations from normality

were observed for the problematic technology use variable. Furthermore, through MD, no multivariate outliers were identified. There was also no evidence of a non-linear relationship or heteroscedasticity when visually inspecting the associated scatterplots.

Spearman Correlation: Further Assumption Testing

Due to the ordinal and ranked nature of the popularity variable (i.e., an aggregated rank variable), a Spearman correlation was performed. Upon visual inspection, a monotonic relationship was observed between the popularity and original TFSV scaled (i.e., not log-transformed) variables, indicating further suitability of this approach. Paired observations were also present across these variables.

Results

Descriptive Statistics: Technology Use and TFSV Experiences

Most participants reported regular use of technological platforms that included social media (*n* = 268; 100%), email (*n* = 249; 93%), text messaging (*n* = 224; 84%), phone calls (*n* = 221; 83%), chat applications (*n* = 199; 74%), and video conferencing (*n* = 194; 72%). Some participants also reported regular use of video game platforms (*n* = 128; 48%), internet forums (*n* = 67; 25%), and dating applications (*n* = 26; 10%). Top reasons for using these platforms included fun (*n* = 254; 95%), socialization (*n* = 235; 88%), school (*n* = 233; 87%), and information and news (*n* = 183; 68%). To cope and escape with reality (*n* = 124; 46%), creativity (*n* = 119; 44%), job (*n* = 97; 36%), romantic connections (*n* = 66; 25%), to escape to a fantasy or imaginary experience (*n* = 61; 23%), sexual connections (*n* = 21; 8%), and volunteering (*n* = 20; 8%) were also reported. Among the top people connected with online by participants included friends (*n* = 256; 96%), family members (*n* = 235; 88%), and schoolmates (*n* = 222; 83%). Work colleagues (*n* = 163; 61%), acquaintances (*n* = 140; 52%), current intimate partners (*n* = 124;

46%), persons been formerly intimate with (*n* = 47; 18%), past intimate partners (*n* = 34; 13%), and strangers (*n* = 29; 11%) were also reported.

In terms of TFSV, 64 (24%) participants reported having no experiences of TFSV, whereas 204 (76%) had experienced at least one type of incident. For more detailed information on TFSV experiences see Table 2.

Table 2

Participant Experiences of TFSV Behaviours (N = 268)

Type of TFSV[a]	Frequency (% of sample)[b]				
	Never	Less than monthly	Monthly	Weekly	Daily
Sexual harassment	152 (57%)	79 (30%)	27 (10%)	8 (3%)	2 (1%)
Sent sexually explicit images, comments, emails, or text messages	122 (46%)	99 (37%)	35 (13%)	10 (4%)	2 (1%)
Partner checking up on location	161 (60%)	30 (11%)	24 (9%)	31 (12%)	21 (8%)
Sent unwanted sexual requests	134 (50%)	73 (27%)	43 (16%)	17 (6%)	1 (<1%)
Partner gained access to online accounts	243 (91%)	15 (6%)	7 (3%)	1 (<1%)	1 (<1%)
Offensive sexual comment posted publicly	245 (91%)	20 (8%)	2 (1%)	0 (0%)	0 (0%)
Personal details posted saying available for sex	254 (95%)	13 (5%)	1 (<1%)	0 (0%)	0 (0%)
Pressured into sending nudes	212 (79%)	42 (16%)	9 (3%)	4 (2%)	1 (<1%)
Nudes take without permission	247 (92%)	18 (7%)	1 (<1%)	1 (<1%)	0 (0%)

Nudes posted/sent without permission	249 (93%)	18 (7%)	1 (<1%)	0 (0%)	0 (0%)
Nudes threatened to be posted/sent	249 (93%)	16 (6%)	2 (1%)	1 (<1%)	0 (0%)
Image/video taken of unwanted sexual experience	250 (93%)	16 (6%)	2 (1%)	0 (0%)	0 (0%)
Image/video posted of unwanted sexual experience	257 (96%)	10 (4%)	1 (<1%)	0 (0%)	0 (0%)
Image/video threatened to be posted of unwanted sexual experience	253 (94%)	11 (4%)	4 (2%)	0 (0%)	0 (0%)
Unwanted sexual experience in-person with someone met online	249 (93%)	16 (6%)	2 (1%)	1 (<1%)	0 (0%)
Unwanted sexual experience in-person with someone met on dating app	251 (94%)	14 (5%)	1 (<1%)	2 (1%)	0 (0%)
Gender-based offensive/degrading messages or comments	176 (66%)	56 (21%)	24 (9%)	9 (3%)	3 (1%)
Sexuality-based offensive/degrading messages or comments	206 (77%)	38 (14%)	16 (6%)	5 (2%)	3 (1%)
Sexually violent threats	237 (88%)	19 (7%)	8 (3%)	4 (2%)	0 (0%)
Unwanted sexual act against avatar or game character	243 (91%)	16 (6%)	8 (3%)	1 (<1%)	0 (0%)
Unwanted sexual act against you via website/email/messages	236 (88%)	23 (9%)	7 (3%)	2 (1%)	0 (0%)
Any behaviours repeated	226 (84%)	24 (9%)	13 (5%)	5 (2%)	0 (0%)

[a]TFSV behaviours are shortened here for brevity. See Appendix E for full item content.

[b]Frequency in the past 6 months.

Primary Technology Measures Characteristics

The psychometric properties of the primary technology scales and measures used in this study are presented in Table 3.

Table 3

Primary Measure Characteristics

Measure	Sample Size (*n*)	Mean	Standard Deviation	Internal Consistency
TFSV Victimization Scale[a]	265	5.80	7.19	.88
Time Spent Using Technology	268	5.93	2.91	-
Risk Perception to Self Measure[b]	260	56.29	17.36	.90
Risk Perception to Others Measure[b]	265	60.62	18.31	.94
Optimistic Bias	258	-4.39	15.88	-
Digital Literacy Scale[c]	261	109.08	13.87	.90
Parental Monitoring Measure[d]	263	7.05	4.45	.87
Problematic Internet Use Questionnaire	268	16.41	4.50	.80
Popularity	257	531.46	198.30	-

[a]An additional item was added to this scale, as outlined in the Measures section. This is also the originally scaled variable (before log transformation).

[b]Differences between scores on these measures were used to derive the Optimistic Bias.

[c]Two items were omitted from this scale, as outlined in the Measures section.

[d]This was a modified version of a past measure. See the Measures section.

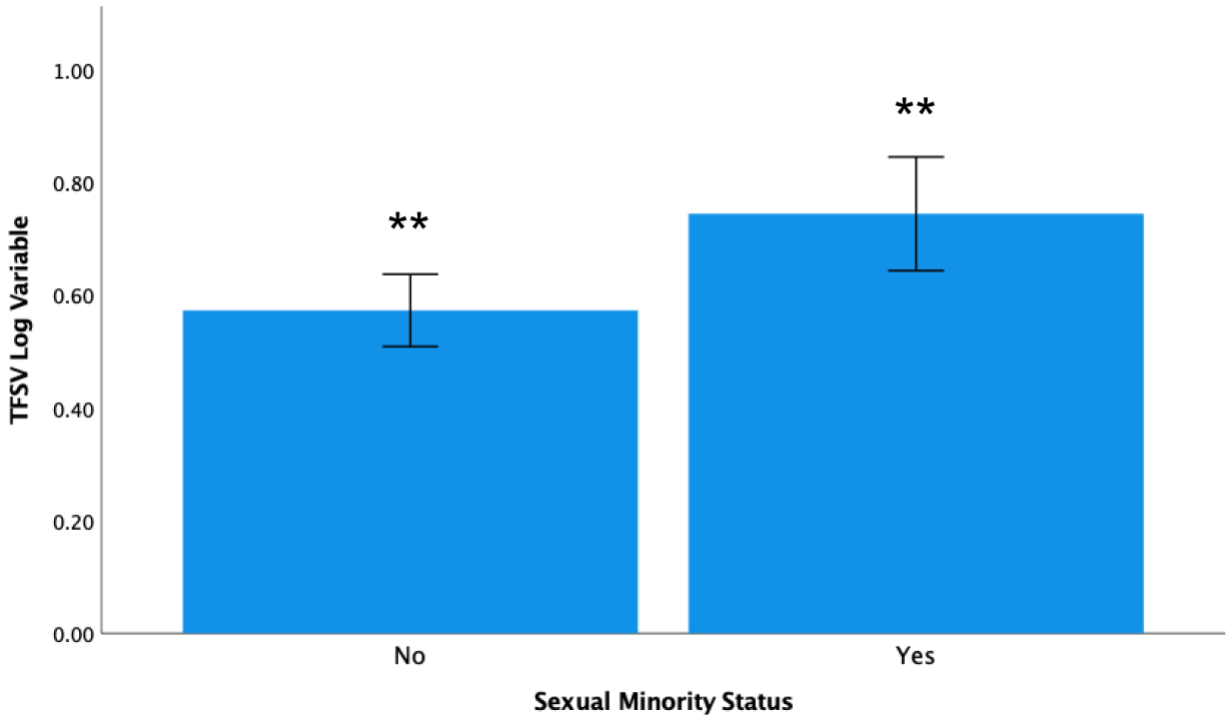
Independent *t*-Tests: Sexual Minority, Racial Minority, and Disability Status Factors

Three independent samples *t*-tests were conducted to examine whether women of sexual minority, racial minority, or disability status were more likely to experience TFSV than women without sexual minority, racial minority, or disability status.

In comparing women with and without sexual minority status, there was a significant difference ($t(256) = -2.84$, $p < .01$, $d = .39$) in TFSV. Women with sexual minority status (n = 76; 29%) experienced significantly more TFSV ($M = 0.74$) than women (n = 185; 71%) reporting no sexual minority status ($M = 0.57$; see Figure 3), with a small-to-medium effect size (Cohen, 1988). To assist with interpretation, these TFSV means equated to 7.57 for women with sexual minority status and 5.11 for women reporting no sexual minority status on the originally scaled TFSV variable (before the log transformation). Median TFSV values for these groups were 3 and 5.5, respectively.

Figure 3

TFSV (Log-Transformed) Mean Comparison Between Sexual Minority Statuses



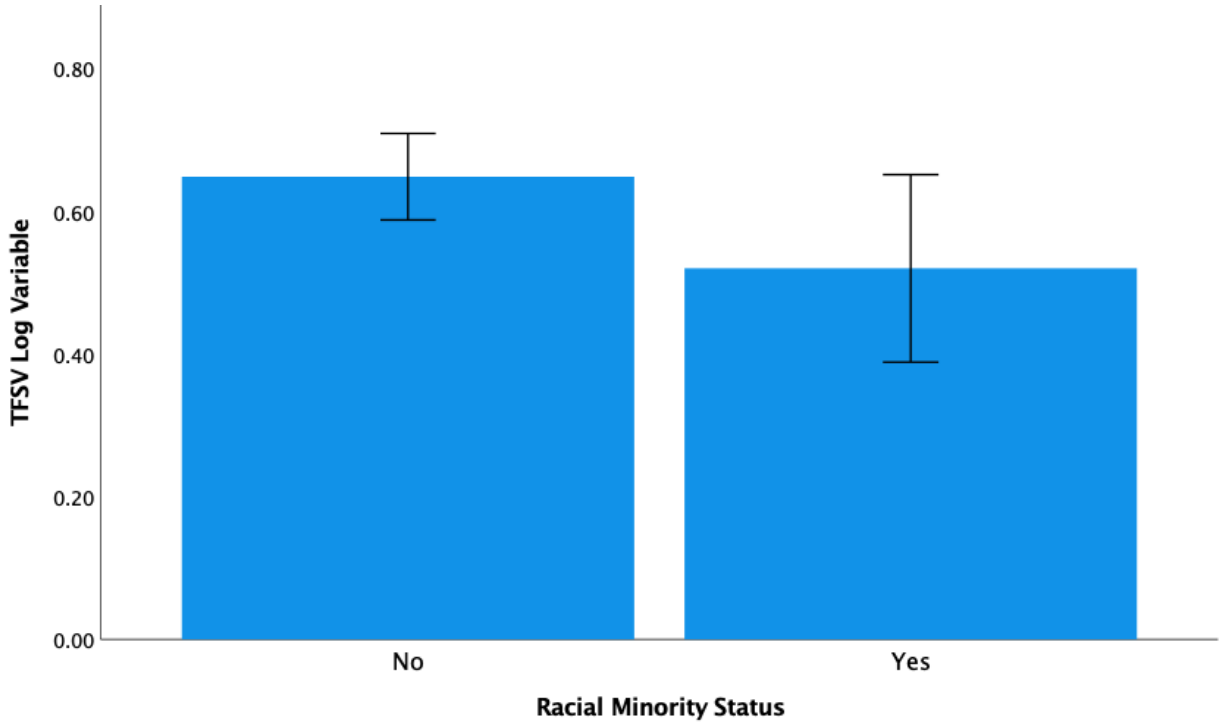
Note. 95% error bars are included in the figure.

**$p < .01$

In comparing women with (n = 52; 20%) and without (n = 205; 80%) racial minority status, there were no significant differences in TFSV ($t(252) = -1.83$, $p = .068$; see Figure 4). Similarly, there were no significant differences between women reporting (n = 31; 12%) and not reporting (n = 226; 88%) disability status in TFSV ($t(252) = 1.74$, $p = .084$; see Figure 5).

Figure 4

TFSV (Log-Transformed) Mean Comparison Between Racial Minority Statuses



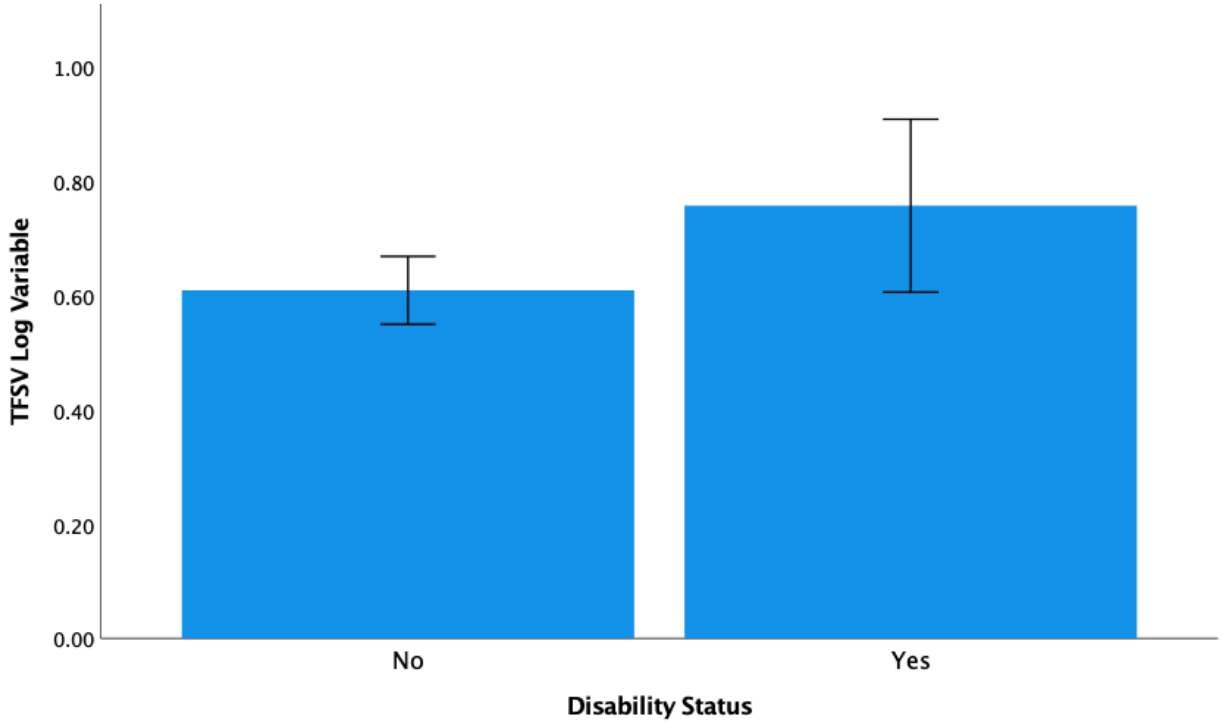
Note. 95% error bars are included in the figure.

Gender Minority Subsample

When re-running these t-tests with only the gender minority subsample (n = 23), all the above results were maintained except for sexual minority status. Here, there was no significant difference ($p > .05$) in TFSV between individuals identifying and those not identifying as a sexual minority.

Figure 5

TFSV (Log-Transformed) Mean Comparison Between Disability Statuses



Note. 95% error bars are included in the figure.

Pearson Correlations: Continuous Demographic and Technological Factors

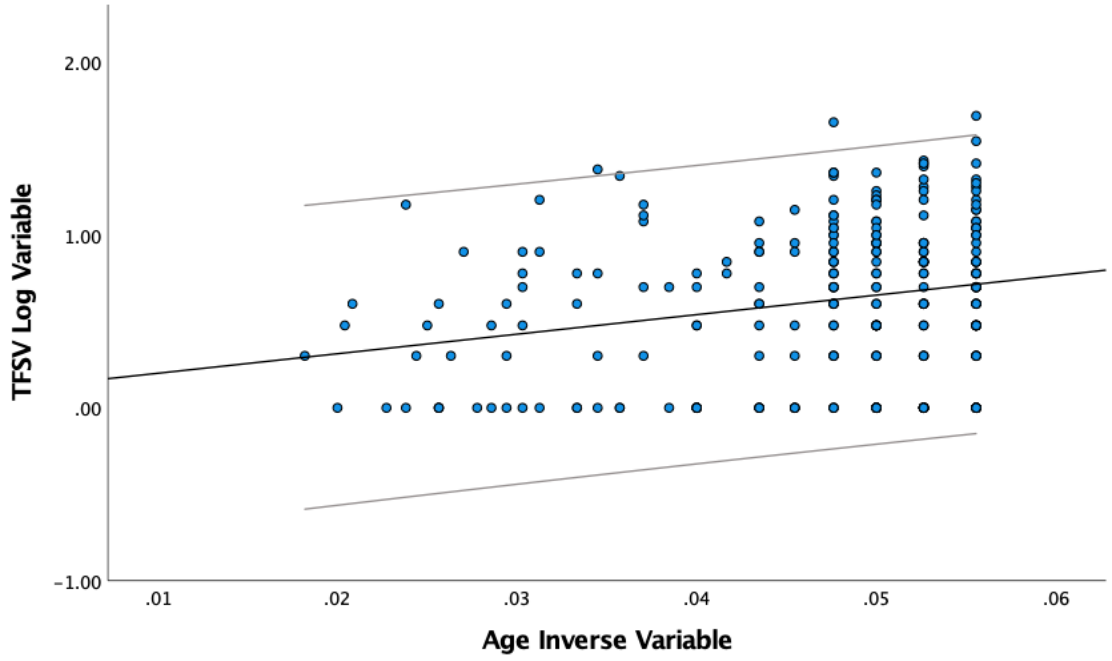
Pearson correlations were conducted to examine whether age, socioeconomic status, time spent using technology, risk perception, the optimistic bias, technological literacy, parental monitoring, or problematic technology use were associated with TFSV experiences in women.

Age

A Pearson correlation revealed a significant positive relationship between the inverse-transformed age variable and the log-transformed TFSV variable ($r(263) = .23$, $p < .001$; see Figure 6). According to Cohen (1988), this relationship was small in effect. To increase interpretation, this correlation was re-run with the original scales for age and TFSV, which indicated a negative relationship between age and TFSV experiences ($r = -.19$).

Figure 6

The Relationship Between TFSV (Log-Transformed) and Age (Inverse-Transformed)



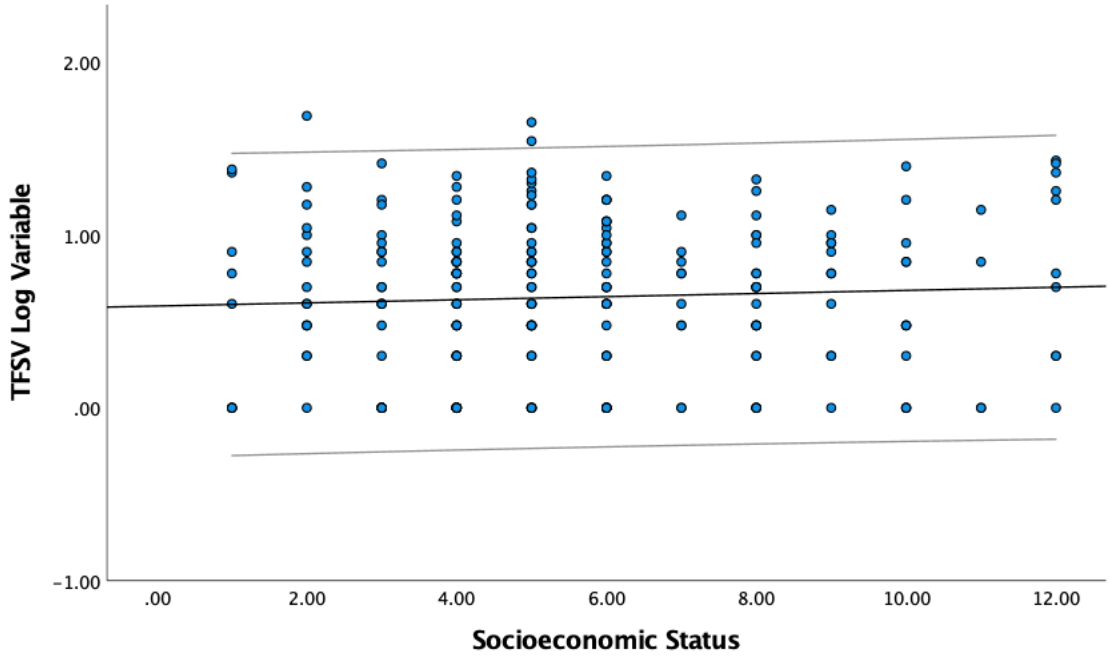
Note. This was a significant correlation ($p < .001$). Individual 95% error bars are represented with the grey lines.

Socioeconomic Status

The relationship between SES and the log-transformed TFSV variable was not significant ($r(227) = .06$, $p = .397$; see Figure 7).

Figure 7

The Relationship Between TFSV (Log-Transformed) and Socioeconomic Status



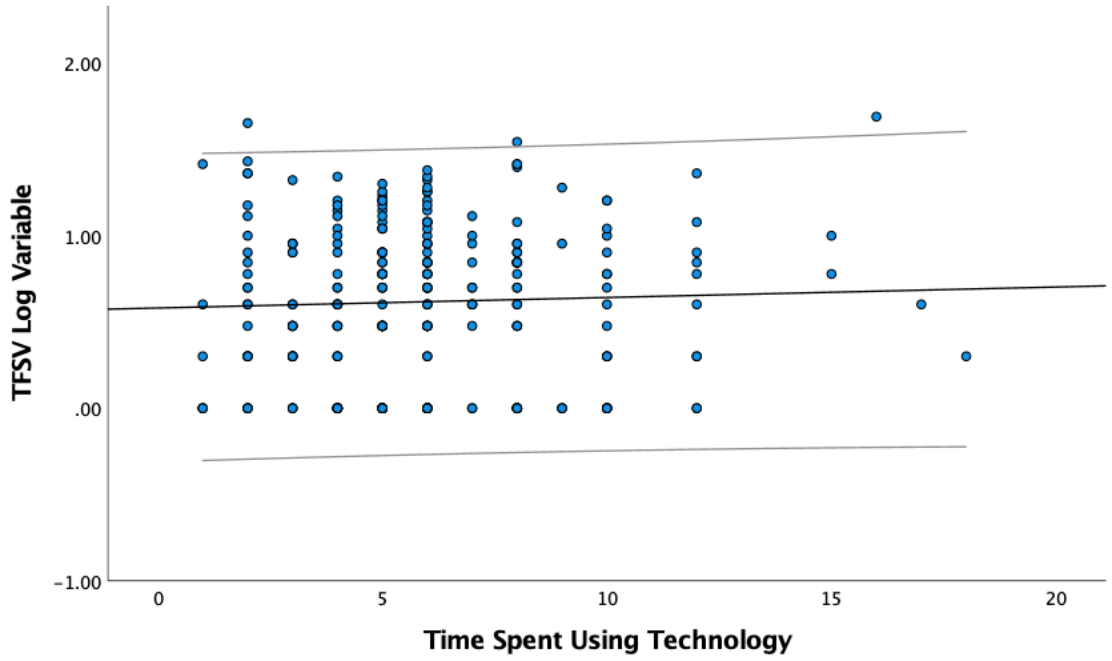
Note. This was not a significant correlation ($p > .05$). Individual 95% error bars are represented with the grey lines. Socioeconomic status was measured through family of origin annual income.

Time Spent Using Technology

The relationship between time spent using technology and the log-transformed TFSV variable was also not significant ($r(263) = .04$, $p = .522$; see Figure 8). After removing the three cases identified as univariate and multivariate outliers, this statistical finding was not altered ($r(260) = .02$, $p = .729$).

Figure 8

The Relationship Between TFSV (Log-Transformed) and Time Spent Using Technology



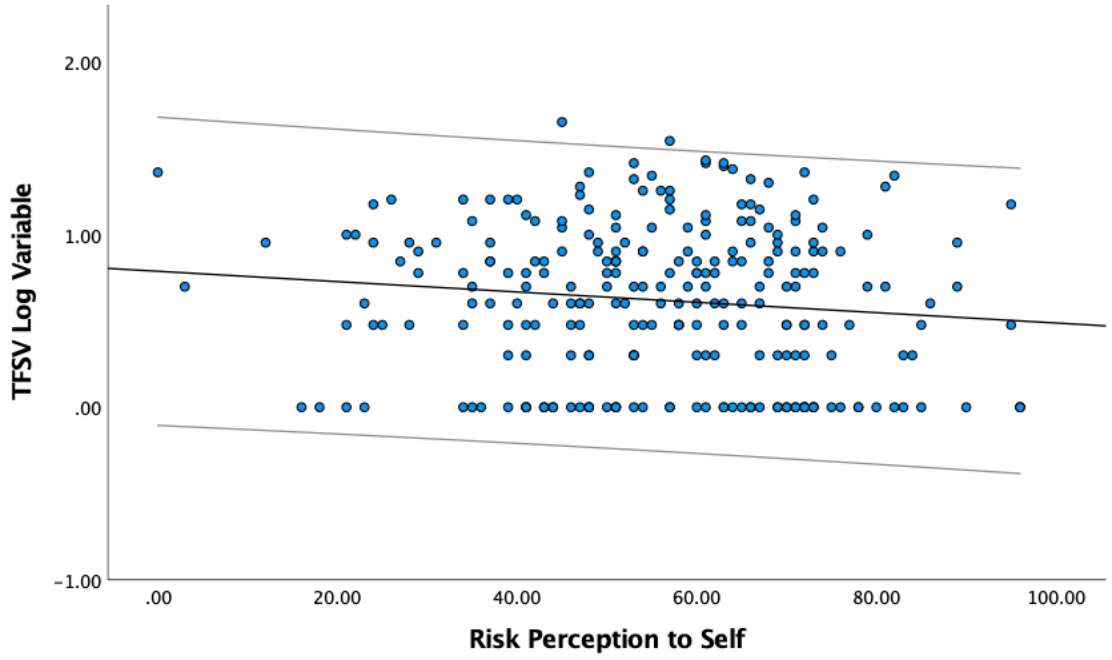
Note. This was not a significant correlation ($p > .05$). Individual 95% error bars are represented with the grey lines.

Risk Perception

The relationship between risk perception and the log-transformed TFSV variable was not significant ($r(263) = -.12$, $p = .062$; see Figure 9).

Figure 9

The Relationship Between TFSV (Log-Transformed) and Risk Perception



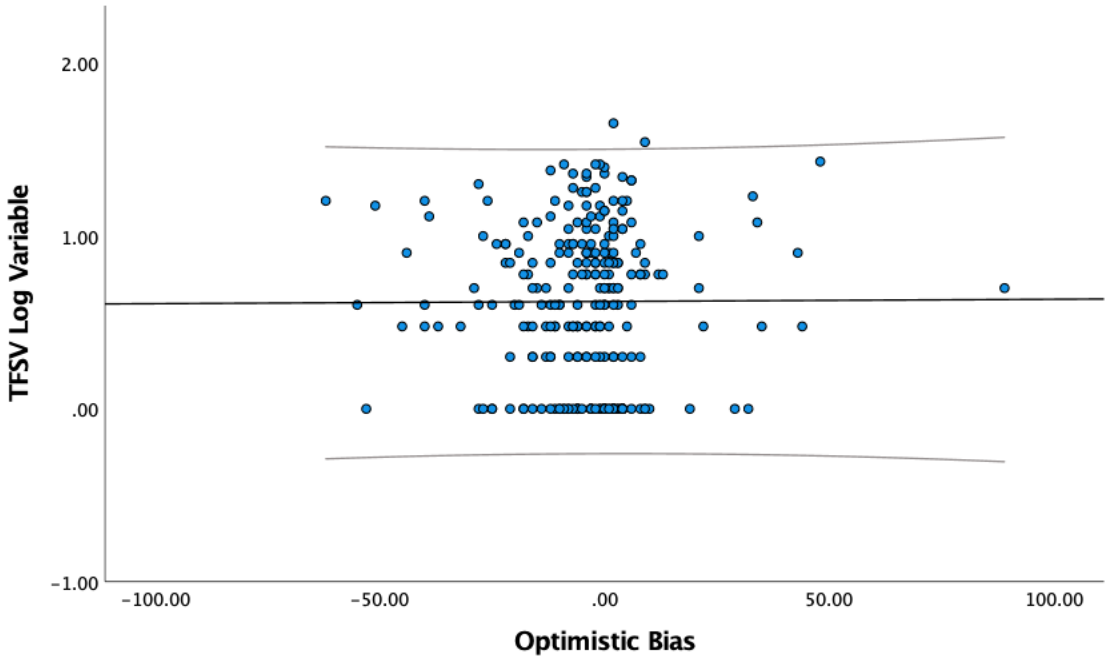
Note. This was not a significant correlation ($p > .05$). Individual 95% error bars are represented with the grey lines.

Optimistic Bias

The relationship between the optimistic bias and the log-transformed TFSV variable was also not significant ($r(262) < .01$, $p = .994$; see Figure 10). After removing the two cases identified as univariate and multivariate outliers, this statistical finding was not altered ($r(260) = -.01$, $p = .929$).

Figure 10

The Relationship Between TFSV (Log-Transformed) and the Optimistic Bias



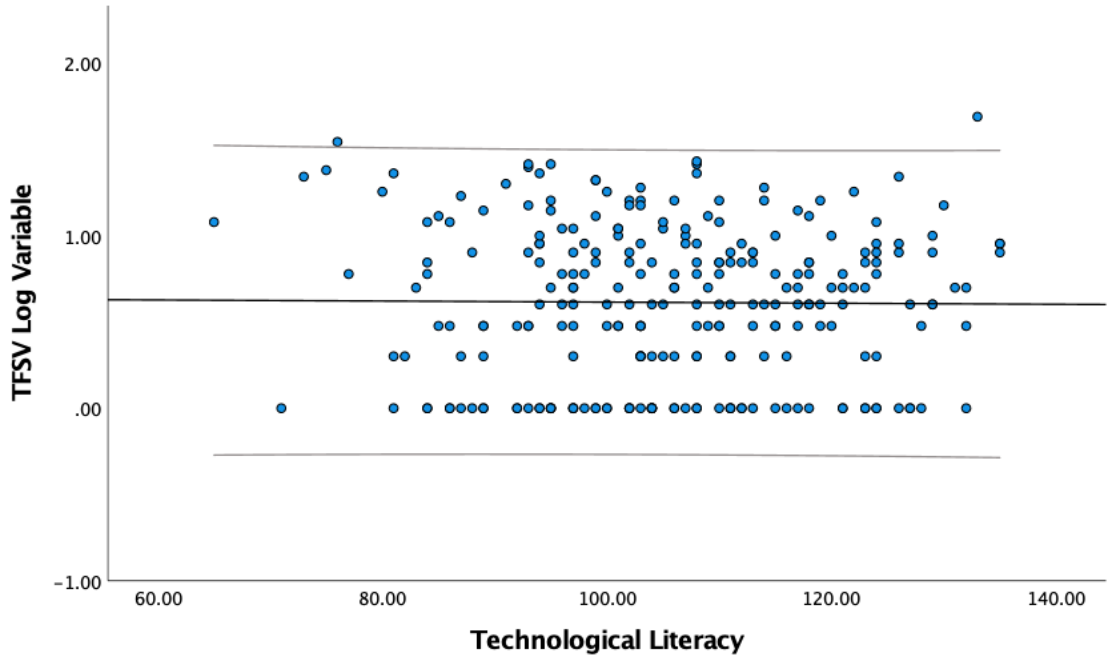
Note. This was not a significant correlation ($p > .05$). Individual 95% error bars are represented with the grey lines.

Technological Literacy

The relationship between technological literacy and the log-transformed TFSV variable was not significant ($r(263) = -.01$, $p = .878$; see Figure 11).

Figure 11

The Relationship Between TFSV (Log-Transformed) and Technological Literacy



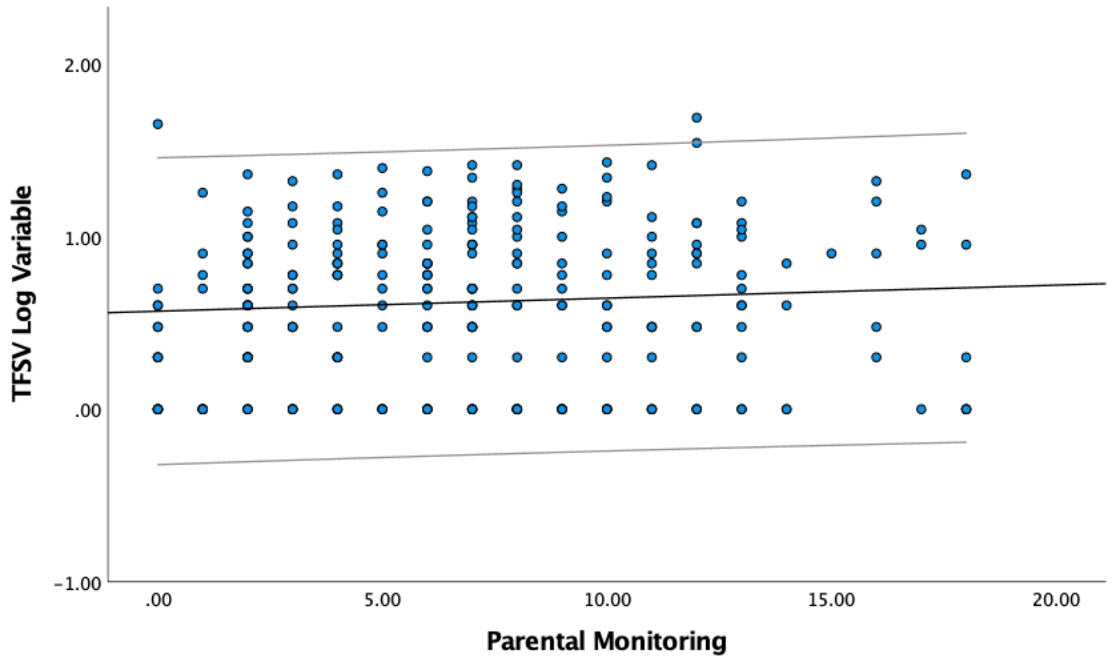
Note. This was not a significant correlation ($p > .05$). Individual 95% error bars are represented with the grey lines.

Parental Monitoring

The relationship between parental monitoring and the log-transformed TFSV variable was also not significant ($r(263) = .07$, $p = .231$; see Figure 12).

Figure 12

The Relationship Between TFSV (Log-Transformed) and Parental Monitoring



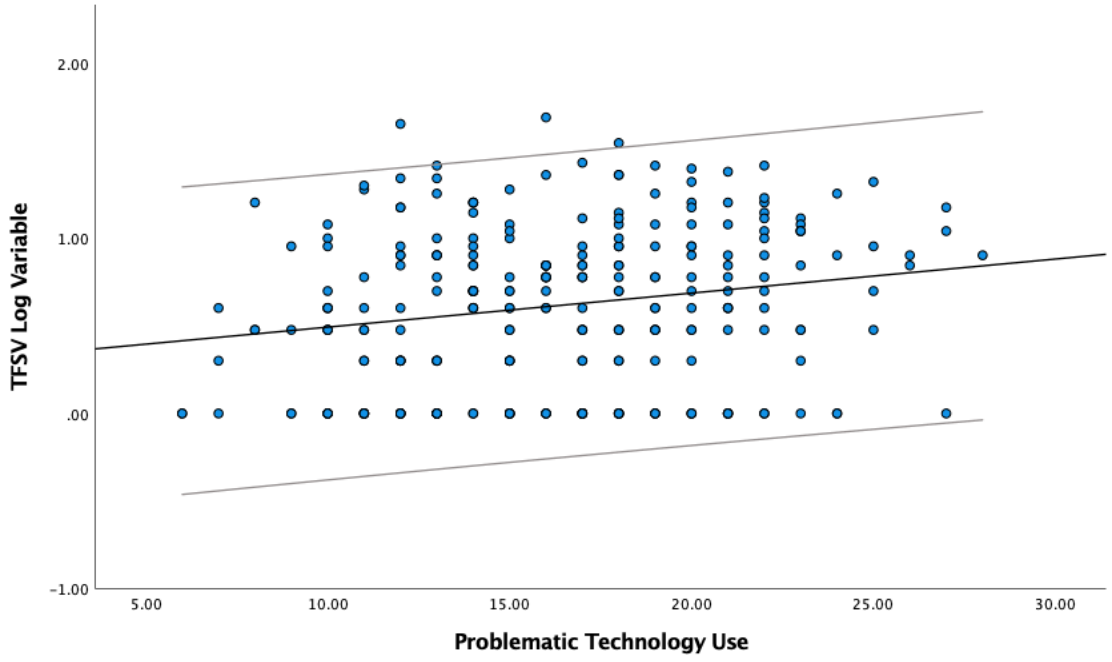
Note. This was not a significant correlation ($p > .05$). Individual 95% error bars are represented with the grey lines.

Problematic Technology Use

The relationship between problematic technology use and the log-transformed TFSV variable was significant ($r(263) = .20$, $p < .001$; see Figure 13). To assist with interpretation, this correlation was re-run with the original scale for TFSV, which indicated a positive relationship between problematic technology use and TFSV experiences ($r = .14$).

Figure 13

The Relationship Between TFSV (Log-Transformed) and Problematic Technology Use



Note. This was a significant correlation ($p < .001$). Individual 95% error bars are represented with the grey lines.

Gender Minority Subsample

For the gender minority subsample (n = 23), Pearson correlations revealed no significant relationships between TFSV and age ($r(20) = .27$, $p = .217$), SES ($r(17) = .32$, $p = .181$), time spent using technology ($r(20) = .21$, $p = .360$), risk perception ($r(20) = -.35$, $p = .111$), the optimistic bias ($r(20) = .21$, $p = .360$), technological literacy ($r(20) = .04$, $p = .870$), parental monitoring ($r(20) = -.13$, $p = .560$), or problematic technology use ($r(20) = -.26$, $p = .240$).

Spearman Correlation: Popularity Factor

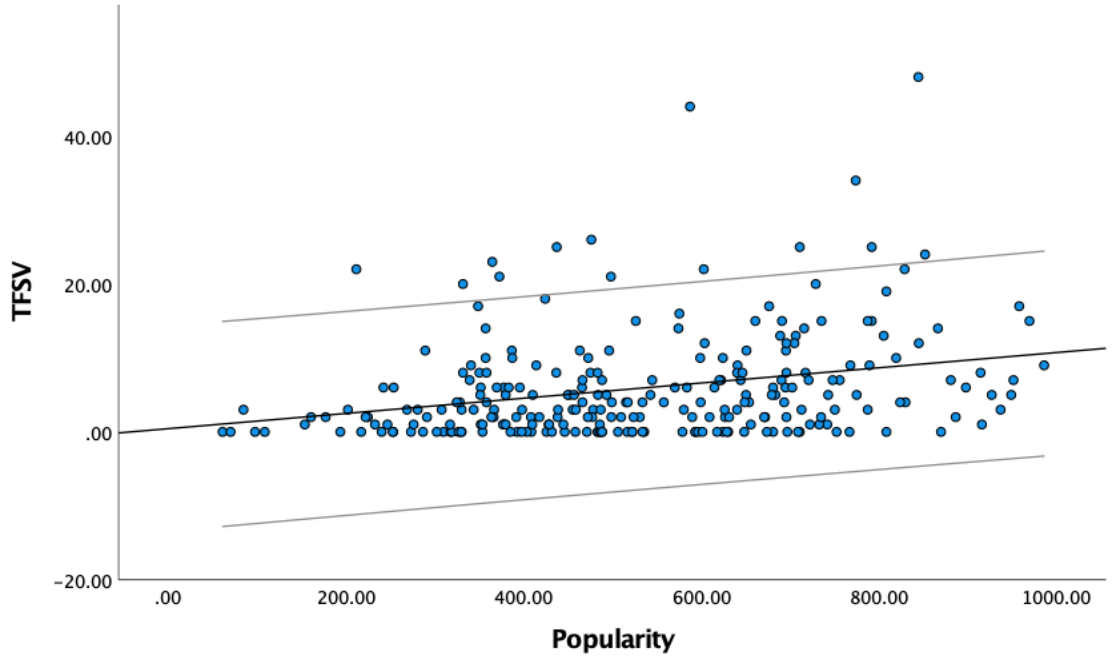
The Spearman correlation was used to examine whether there may be an association between popularity and TFSV experiences. A Spearman correlation indicated a significant positive monotonic relationship between popularity and TFSV ($r_s(252) = .31$, $p < .001$; see Figure 14). Applying conventions from Cohen (1988) to gauge effect size, this relationship was moderate in nature.

Gender Minority Subsample

When examining only the gender minority sample (n = 23), the relationship between TFSV and popularity was not significant ($r_s(20) = .32$, $p = .151$).

Figure 14

The Relationship Between TFSV and Popularity



Note. This was a significant correlation ($p < .001$). Individual 95% error bars are represented with the grey lines.

Study One Discussion

In this series of dissertation studies, Study One focused on identifying demographic and technological vulnerability factors for technology-facilitated sexual violence (TFSV) in a sample of women. Based on Intersectionality Theory (Crenshaw, 1990), a set of demographic factors were targeted, which included age, socioeconomic status, disability status, and sexual and racial minority statuses. Significant findings were demonstrated for sexual minorities and younger ages, which indicate these may serve as vulnerability factors for women. From a literature review of related research (e.g., adolescent populations, in-person sexual violence) and the identification of numerous gaps covering technological factors and TFSV vulnerability, risk perception, parental monitoring, technology literacy, the optimistic bias, problematic technology use, and

popularity, were also investigated (e.g., Cover et al., 2024; Elsaesser et al., 2017; Gidycz et al., 2006; Graham & Triplett, 2017; Machimbarrena et al., 2021). The latter two factors were both identified as potential vulnerability factors for women. These results highlight that certain groups of women may experience heightened vulnerability to TFSV based on their demographic background and patterns of technology use.

In this study, nearly 30% of the 268 women sampled identified as a sexual minority, which allowed for a robust examination of this identity as a potential vulnerability factor for TFSV. The resulting finding, that sexual minority women may experience heightened vulnerability to TFSV compared to heterosexual women, is congruent with past research findings (e.g., Powell & Henry, 2019). However, it should be noted that 50% of the sexual minority women in our sample identified as bisexual, which impairs any understanding of whether this vulnerability exists among other members of the 2SLGBTQIA+ community. The other demographic finding, that younger age was associated with heightened vulnerability, has also been echoed in past research (e.g., Powell et al., 2018). Thus, the finding that younger women and sexual minorities may be more vulnerable to TFSV now appears to have garnered support across different studies and countries (e.g., Australia, Canada, and the United States). Some of these studies also lack comprehensive details about their participants' backgrounds (i.e., country of origin), suggesting that these results may also be supported for samples derived internationally (due to the recruitment of individuals across borders).

No significant results were yielded for racial minority, socioeconomic, and disability statuses as vulnerability factors, counter to hypotheses based on an intersectional lens. These factors have been less studied within the TFSV literature, so whether these results will align with future research is unclear. However, if these results are consistent, one might opine that these

factors may buttress against heightened vulnerability because of the presence of a third variable that serves as a protective factor. For example, socioeconomic disadvantage may be both a vulnerability and protective factor in this context, whereby women with low socioeconomic status (SES) may be targeted by perpetrators (according to Intersectionality Theory; Crenshaw, 1990) but less involved in certain technological spaces due to significant expense to do so (e.g., having to purchase a data plan to use smartphones when away from Wifi networks). This could buttress any effect of the potential targeting of women of low SES. Or perhaps those of racial/ethnic minority backgrounds, low SES, or disability may be less willing to disclose their TFSV experiences or have less awareness of what constitutes TFSV, so these experiences were not fully captured in this research. It could also be the case that these factors serve neither as a vulnerability nor protective factor. These and related hypotheses could be examined in future research.

This study was also the first to investigate technological vulnerability factors for TFSV in women. As hypothesized, women who attained more popularity through their online social networks and those who engaged in problematic technology use experienced more TFSV and this suggested heightened vulnerability. Again, this does not place the responsibility or blame on these women for the TFSV enacted by perpetrators. However, these results make intuitive sense, given the increased social contact that one has when they are popular online and engaging in certain behaviours (e.g., overusing technology). This notion is reflected in the literature on forms of technological violence against public figures, where results have indicated that online public figures have an economic incentive to engage with other users, rendering them vulnerable to abuse (e.g. Cover et al., 2024). The fact that the other hypothesized technological vulnerability factors were not supported, which included risk perception, parental monitoring, technology

literacy, and the optimistic bias, suggests that these factors may be more important to consider among child or adolescent samples (e.g., parental monitoring) or for other types of technological victimization (e.g., technology literacy). However, these factors certainly warrant further examination.

Ultimately, this study assists in delineating potential demographic and technology-specific factors that may increase women's vulnerability to TFSV. Currently, information about such factors is limited in the literature; as such, these results provide a broader understanding of *who* may be targeted. This, along with the greater body of research, can inform prevention programs. Furthermore, identifying women who are at particular risk of TFSV when using technology can generate more awareness as to the barriers that they face while engaging in technology-based activities (e.g., at work, during school). However, *how* these women are affected by TFSV is another matter that will now be a focus of the subsequent study in this series.

Study Two: Ecological Momentary Assessment

Study Two built on the findings of Study One by examining the temporal relationships between TFSV and distress. Targeting the aforementioned gaps in the literature, TFSV and distress were investigated using ecological momentary assessment (EMA) in a prospective design. Momentary affect was examined after TFSV incidents, and pre-and post-EMA distress measures were collected. The same group of participants was used for parts one (pre-TFSV), two (during TFSV), and three (post-TFSV) of Study Two. The main research questions were:

1. Is momentary affect after TFSV incidents different than momentary affect after non-TFSV events?
2. Is TFSV associated with a change in distress over time?

3. Does distress serve as a vulnerability factor for TFSV?
4. Does baseline distress have a potential moderating role in the relationship between TFSV events and momentary affect?

Hypotheses

Based on past research examining TFSV and psychological distress (e.g., Cripps & Stermac, 2018; Douglass et al., 2018; Oliver et al., 2023), and past research showcasing that distress may function as both a precursor to and consequence of in-person sexual violence (e.g., Krahé & Berger, 2017; Brunton & Dryer, 2022), it was predicted that momentary affect after TFSV would be lower than momentary affect after non-TFSV events. It was also predicted that distress scores would increase over time as experiences of TFSV occurred, compared to those not experiencing TFSV. Furthermore, it was predicted that higher baseline distress would predict TFSV experiences. Finally, baseline distress was hypothesized to moderate the relationship between TFSV events and TFSV-related affect, with higher baseline distress predicting higher TFSV-related negative affect and lower positive affect.

Methodology

Participants

Two hundred and sixty-eight undergraduate women 18 years and older from Lakehead University were recruited for this study. Note that women were asked to self-select in response to the advertisement (i.e., "*Do you identify as a woman, are you over 18 years of age, and do you have consistent access to a smartphone?"*). Four participants were excluded due to not completing any items on the primary technological issues and TFSV scale, which resulted in a final sample of 264. Fifty-five participants went on to participate in the ecological momentary assessment (EMA) portion of the study, and 30 completed the entire study (see Table 4 for

demographic information). Using G*Power 3.1 for a two-tailed independent samples *t*-test with an alpha level of 0.05, power level of 0.95, and effect size of 0.5, metrics derived from past research by Cripps and Stermac (2018), a sample size of 210 was estimated. Due to potential attrition, noted to be ~20% to 30% in EMA (de Vries et al., 2021; Williams et al., 2021), an additional 52 participants were targeted, which rendered a final sample size estimate of 262. Therefore, the total sample was larger than what was estimated. However, ultimately, this recruitment target was unable to be maintained for all portions of the study.

In terms of remuneration, participants who completed the eligibility measures and the video orientation and baseline measures (i.e., if eligible to participate in the EMA portion of the study), were provided with 0.5 bonus points toward an eligible psychology course. For completing the EMA portion of the study, participants either elected to receive an additional 1.5 bonus points or three entries into a gift card draw to win one of ten $25 electronic gift cards to a location of their choosing. Participants received an additional entry into the gift card draw for completing the post-EMA distress measure. Thus, participants could obtain up to two bonus points and up to four entries into a gift card draw for participating in this study.

Table 4

Participant Demographic Information

Characteristic	Count (% of sample)		
	Pre-EMA Survey ($N = 264$)	EMA ($N = 55$)	Post-EMA Survey ($N = 30$)
Mean Age (*SD*)	22.78 (6.52)	23.98 (7.67)	23.57 (7.56)

Gender [a]			
Genderfluid	2 (1%)	-	-
Nonbinary/Genderqueer/Gender nonconforming	3 (1%)	1 (2%)	1 (3%)
Questioning	1 (<1%)	1 (2%)	1 (3%)
Transgender	2 (1%)	2 (4%)	2 (7%)
Two-Spirit	2 (1%)	-	-
Man	1 (<1%)	1 (2%)	1 (3%)
Woman	260 (99%)	54 (98%)	29 (97%)
Sexual Orientation[a]			
Asexual	9 (3%)	1 (2%)	-
Bisexual	46 (17%)	14 (26%)	7 (23%)
Heterosexual	193 (73%)	34 (62%)	17 (57%)
Lesbian	5 (2%)	2 (4%)	2 (7%)
Pansexual	9 (3%)	3 (6%)	2 (7%)
Queer	8 (3%)	3 (6%)	3 (10%)
Questioning	5 (2%)	1 (2%)	1 (3%)
Prefer not to answer	4 (2%)	-	-
Racial, Ethnic and/or Cultural Background[a]			
African	10 (4%)	2 (4%)	2 (7%)
Black	9 (3%)	2 (4%)	1 (3%)
Caribbean	5 (2%)	1 (2%)	-
East/Southeast Asian	9 (3%)	-	-
Hispanic/Latinx	6 (2%)	-	-
Indigenous	30 (11%)	7 (13%)	4 (13%)
Middle Eastern	4 (2%)	2 (4%)	1 (3%)
Pacific Islander	1 (<1%)	-	-
South Asian	15 (6%)	4 (7%)	4 (13%)
White	191 (72%)	42 (76%)	21 (70%)
Mixed	16 (6%)	4 (7%)	3 (10%)
Prefer not to answer	3 (1%)	-	-
Background not captured above	4 (2%)	1 (2%)	-
Disability Status			
Yes	42 (16%)	12 (22%)	8 (27%)
No	211 (80%)	41 (75%)	22 (73%)
Prefer not to answer	11 (4%)	2 (4%)	-
Highest Level of Education			
Highschool completed	82 (31%)	16 (29%)	11 (37%)
Some college or technical school training	6 (2%)	3 (6%)	3 (10%)
College or technical school completed	35 (13%)	6 (11%)	3 (10%)
Some undergraduate training	123 (47%)	27 (49%)	12 (40%)
Undergraduate degree completed	12 (5%)	3 (6%)	1 (3%)
Graduate degree completed	5 (2%)	-	-

Student Status[a]			
Full-time	234 (89%)	52 (95%)	28 (93%)
Part-time	29 (11%)	3 (6%)	2 (7%)
Domestic	241 (91%)	50 (91%)	25 (83%)
International	21 (8%)	5 (9%)	5 (17%)
Mean Current Grade Point Average (*SD*)	76.80 (9.77)	78.91 (8.24)	80.76 (9.02)
Employment Status			
Full-time	25 (10%)	2 (4%)	-
Part-time	162 (61%)	36 (66%)	20 (67%)
Unemployed	77 (29%)	17 (31%)	10 (33%)
Family of Origin Income			
Under $10,000	9 (3%)	1 (2%)	1 (3%)
$10,001-$24,999	11 (4%)	1(2%)	1 (3%)
$25,000-$49,999	40 (15%)	8 (15%)	2 (7%)
$50,000-$74,999	29 (11%)	7 (13%)	6 (20%)
$75,000-$99,999	32 (12%)	9 (16%)	5 (17%)
$100,000-$124,999	27 (10%)	9 (16%)	6 (20%)
$125,000-$149,999	15 (6%)	3 (6%)	1 (3%)
$150,000-$174,999	18 (7%)	2 (4%)	1 (3%)
$175,000-$199,999	10 (4%)	1 (2%)	-
$200,000-$249,999	12 (5%)	4 (7%)	2 (7%)
$250,000-$299,999	7 (3%)	2 (4%)	1 (3%)
$300,000 or more	8 (3%)	2 (4%)	-
Marital Status			
Single	142 (54%)	24 (44%)	15 (50%)
Married	23 (9%)	6 (11%)	4 (13%)
Separated/divorced	6 (2%)	3 (6%)	1 (3%)
Committed relationship	91 (35%)	22 (40%)	10 (33%)
Widowed	1 (<1%)	-	-
Prefer not to answer	1 (<1%)	-	-

[a]Participants were able to select multiple options, so percentages do not sum to 100%.

Procedure

Participants were recruited through the online course credit system at Lakehead University. The information letter and consent form were available on the SurveyMonkey platform for their review (see Appendices B and M).

Part One: Pre-Ecological Momentary Assessment (EMA) Eligibility, Orientation, and Baseline Measures

Participants interested in participating in this study were assessed for eligibility for the EMA portion of the study via the SurveyMonkey platform. Specifically, those who completed the baseline measures and indicated that they had experienced at least one TFSV event over the last two years were invited to partake in the EMA portion. In some cases, participants were eligible to participate in the EMA portion of the study but were not invited to participate. This occurred when the time to complete the EMA extended beyond the school semester to protect against the lack of completion expected to happen during school downtimes. Hence, only the baseline measures for these participants were available. Participants who were not invited to participate in the EMA portion of the study were thanked for completing the survey and provided with a separate debriefing form from the women who participated in the EMA portion (see Appendices N and O).

As an orientation to the study, those who were eligible and invited to participate viewed a video created by the student researcher on the SurveyMonkey platform, which provided instructions on completing the EMA study protocol. This video included information on the SEMA^3 application used to complete the EMA measures. More information on this application is provided below. A short protocol check was conducted with the participants to ensure they understood what was expected during the study (see Appendix P). Although it was intended for the student researcher to contact participants who failed any questions in the protocol check to ensure participants' understanding of the study protocol, this only occurred in the latter half of recruitment due to early technical issues with the SurveyMonkey platform. Participants also completed a baseline measure of their distress after completing the protocol check on

SurveyMonkey. Note that special precautions were taken in this study to minimize any distress that might occur due to the focus on sexual violence. This included using careful and compassionate language throughout study materials and offering mental health resources (e.g., crisis phone numbers) to all participants at the end of the study.

Part Two: Ecological Momentary Assessment (EMA)

This study used EMA to capture the real-time experiences of TFSV. EMA was developed in 1994 by Stone and Shiffman and has gained popularity over the past decade. It can be considered within a category of diverse methodologies that examine everyday experiences over time, including experience sampling methods, diary methods, ambulatory assessment, and intensive longitudinal designs (Reis & Judd, 2014). The increasing uptake of handheld devices has allowed for the expansion of EMA within the research sphere, as researchers can now collect data in the moment and over time more easily within participants' natural environment (Reis & Judd, 2014). In this EMA study, participants accessed measures through a smartphone application called SEMA^3 after completing the baseline measures and video orientation on SurveyMonkey.

SEMA^3 Application. SEMA^3 is a smartphone application created in 2013 by researchers at the University of Melbourne (O'Brien et al., 2024). Since its inception, this application has been used by researchers globally, including within Canada, to collect EMA data. This application is free to use for both researchers and participants and is downloadable on most smartphone devices. The application allows participants to receive surveys at pre-recorded intervals on their smartphones and also allows them to access surveys on their own accord (i.e., event-contingent intervals). During the video orientation, participants were instructed on how to download SEMA^3 onto their phones.

For the SEMA^3 application, all participant data is securely stored on servers at the University of Melbourne and is maintained by the Melbourne eResearch Group. Once participants completed the protocol check and baseline measures from the orientation session on SurveyMonkey, they were sent their unique identifier to log into the SEMA^3 application on their phones. This unique nine-digit numeric identifier and their personal information, including name and email address, were not stored on the platform. For more information on the privacy and security of the SEMA^3 application, please visit https://sema3.com/privacy.html.

TFSV Event-Contingent Condition #1. Participants were able to access event-contingent measures whenever they experienced TFSV during the three weeks of the EMA. Three weeks were chosen to maximize the likelihood that participants would experience TFSV during the study while minimizing participant burden. Participants were encouraged to fill out the measures immediately after a TFSV event occurred and were given a maximum of one hour after any event to do so. If any participants experienced more than one TFSV event in the day, they were encouraged to complete only the measures for the first incident of the day to reduce burden. These measures took no longer than five minutes to complete. The items were also shown to participants in a drop-down fashion to minimize the amount of time needed to scroll through the options. Participants received a daily prompt to remind them to monitor for TFSV events.

In-The-Moment (Non-Event Interval-Contingent) Condition #2. To obtain data for a comparison (i.e., "non-event") condition, henceforth referred to as the "In-the-Moment" condition, which was used to monitor participants' affect outside of TFSV events, participants completed interval-contingent measures, where they received random prompts to their smartphone three different times during the EMA to fill out measures based on the current

moment. In line with the TFSV condition, these measures took no longer than five minutes to complete and were modelled similarly.

Technological Issue Event-Contingent Condition #3. To increase internal validity and reduce participant susceptibility to demand characteristics related to filling out measures about TFSV and thus endorsing negative affect as a result, participants were also asked to fill out measures whenever they experienced technological issues. This occurred concurrently over the three weeks, and items took no longer than five minutes to complete. The first question appeared like the TFSV condition #1 because they were both event-contingent. However, once participants selected the issue they experienced (i.e., TFSV versus technological issue), they received more questions either addressing TFSV (condition #1) or technological issues (condition #3) congruent to their selection. After selecting technological issues, other questions were also modelled to appear similar to the other two conditions to further reduce demand characteristics. Due to its sole function of increasing internal validity, the measures from this condition were not used for study analyses.

Part Three: Post-Ecological Momentary Assessment (EMA) Survey

Once participants completed the EMA, they were sent a SurveyMonkey link to fill out a post-EMA distress measure and they also received the debriefing form. Here, participants were asked to log into the SEMA^3 application again to ensure that all their data was uploaded (i.e., including data they may have provided offline). They were also encouraged to delete the SEMA^3 application at this time, marking the completion of the study.

Measures

Part One (Pre-EMA) Measures

Demographics. The same demographics questionnaire used for Study One was used in this study (see Appendix F). Any participants who did not identify as women or who were under the age of 18 were ineligible for this study.

TFSV. As in Study One, the TFSV-V Scale developed by Powell and Henry (2019) was also used in this study (see Appendix E). For psychometric properties, see the measures section for Study One. The TFSV-V Scale also retained the modifications used in Study One, as outlined in that section. Participants were asked if they had experienced any of the incidents of TFSV in the measure over the last two years. Please see Table 6 for the performance of this measure in the current study.

Technological Issues. Participants were also asked about the technological issues they experienced over the past two years (see Appendix Q). This measure was explicitly created to reduce demand characteristics in this study, as outlined above.

Part One and Part Three (Pre- and Post-EMA) Distress Measure

The General Health Questionnaire (GHQ-12; see Appendix R) was used in this study to measure psychological distress. This questionnaire was developed as a screening instrument for those at risk of psychiatric disorders (Goldberg, 1972; Goldberg & Williams, 1988). Though the GHQ-12 was created to measure a unidimensional construct (i.e., general mental well-being), some research has suggested it may be multidimensional (e.g., Rey et al., 2014). For instance, the scale contains items that are both positively (e.g., “Have you recently felt you were playing a useful part in things?”) and negatively worded (e.g., “Have you recently been thinking of yourself as a worthless person?”), leading some to identify a two-factor structure (e.g., Rey et al., 2014). However, recent meta-analytic studies have indicated that these subscale scores have little unique variance, suggesting that this measure is essentially unidimensional (Gnambs &

Staufenbiel, 2018). For each of the 12 items, a 4-point Likert style scale was utilized from *not at all* to *always*. The GHQ-12 has been a popular measure used internationally, with estimates of its internal consistency ranging from .79 to .91 (Hankins, 2008; Shevlin & Adamson, 2005). It has also achieved correlations in the expected directions with other measures of negative affect, depression, and anxiety (Tait et al., 2003). Please see Table 6 for the performance of this measure in the current study.

Part Two (EMA) Measures

TFSV Measure (Condition #1). Participants partaking in the EMA portion of the study were asked to monitor their TFSV-related experiences using the TFSV-V Scale developed by Powell and Henry (2019; see Appendix E). Rather than over the last two years, which was the timeframe used in the eligibility portion of the study, participants completing the EMA were asked which TFSV event from this scale they *just* experienced. They also had the ability to select multiple categories of TFSV due to their potential to overlap. In addition to these questions, participants were asked about the context in which this event occurred (see Appendix S for these additional questions).

In-The-Moment Measure (Condition #2). To mirror the TFSV event-contingent measure above, participants were asked to answer questions about their current activity. Specifically, questions were related to what technology they may have been using, with whom, and where they were using it (see Appendix T).

Technological Issue Measure (Condition #3). Participants were also asked about the technological issues they experienced, as they were in the eligibility measure (see Appendix Q). However, in this EMA portion of the study, instead of over the past two years, participants were asked about the technological issue they *just* experienced. An additional item, "I encountered an

issue with the technology used in this study," was also added. Furthermore, questions about the context of this technological issue were also queried to mirror the other conditions (see Appendix U).

Momentary Affect. Affect was measured with the International Positive and Negative Affect Schedule Short Form (I-PANAS-SF; Thompson, 2007) across all three conditions (i.e., TFSV, in-the-moment, technological issue; see Appendix V). This schedule was chosen because of the brevity of the items to further reduce participant burden. The I-PANAS-SF contains five items that measure positive affect (i.e., active, determined, attention, alert, and inspired) and five that measure negative affect (i.e., afraid, nervous, upset, hostile, and ashamed). Item responses are on a 5-point Likert-style scale from *never* to *always.* However, in this study, the responses were adapted to range from *not at all* to *extremely* to reflect participants' current mood states. Thompson's (2007) study indicated the scale's psychometric properties, including internal consistency ($\alpha = .78$ for the negative affect subscale and $\alpha = .76$ for the positive affect subscale), positive correlations with the original PANAS ($\alpha = .59$ for the negative affect subscale and $\alpha = .65$ for the positive affect subscale), test-retest reliability ($\alpha = .84$), and convergent validity (with correlations in the expected positive direction with similar measures for each negative and positive affect). Please see Table 6 for the performances of this measure for positive and negative affect in the current study.

Statistical Analyses

Measure characteristics and descriptive statistics were used to evaluate the primary measures used in this study and the trends in participant enrollment and TFSV behaviours encountered throughout the study. To examine the first research question, whether momentary affect after TFSV incidents differ from in-the-moment events ("non-events"), dependent samples

t-tests were performed. For research question two, whether TFSV may change distress over time, change scores were computed and then subjected to an independent samples *t*-test. A one-way ANOVA was performed to examine research question three — whether distress may serve as a vulnerability factor for TFSV. A Pearson product moment correlation and Spearman rank order correlation were used to determine whether distress may influence TFSV-related affect, targeting the fourth and final research question. Missing data were subjected to pairwise deletion across these analyses.

Further Exclusions

The entire sample ($N = 264$) in part one (pre-EMA) was composed of participants solely reporting a woman gender identity ($n = 255$; 97%) and participants who fell under a broader gender-diverse umbrella ($n = 9$; 3%). To examine whether the solely women and gender-diverse subgroups might be viewed as being sampled from the same population, these subgroups were compared on several demographic factors, which included age, racial minority status, and education, as well as TFSV and GHQ scores. Independent samples *t*-tests and chi-square analyses indicated a significant difference ($p < .05$) between subgroups in GHQ scores, indicating significantly higher baseline distress for gender-diverse compared to women-only participants. Due to this difference in one of the main study measures, the nine gender-diverse participants were ultimately excluded from subsequent analyses. This led to 52 and 27 participants being retained for part two (EMA) and part three (post-EMA) of the study, respectively.

In part two of the study (EMA), participants ($n = 52$) varied in their response rate across the three different conditions (i.e., TFSV [condition #1] vs. in-the-moment [condition #2] vs. technological issues [condition #3]). For details on participant completion of measures across

these conditions, see Table 5. This table outlines the number of participants who completed at least one entry for each of the indicated condition(s) combinations.

Table 5

Participant (n = 52) Completion of EMA Measures

	Condition Combinations					
	All Conditions	Conditions #1 + #2	Conditions #1 + #3	Conditions #2 + #3	Condition #2	Condition #3
	TFSV + Technological Issues + In-The-Moment	TFSV + In-The-Moment	TFSV + Technological Issues	In-The-Moment + Technological Issues	In-The-Moment Only	Technological Issues Only
n completed	13	0	6	23	1	9

Note. Sample sizes indicate the number of participants who completed at least one entry for the indicated condition(s) combination. These counts are mutually exclusive.

Given differences in EMA engagement, participants were compared on age, sexual diversity, racial minority status, disability status, marital status, highest level of completed education, TFSV, and GHQ (all completed during part one [pre-EMA]) between those who completed at least one in-the-moment event ($n = 37$) versus those who did not complete any in-the-moment events ($n = 15$). In-the-moment events were chosen for comparison because all participants received these prompts, whereas TFSV and technology events were only completed if participants triggered them. Comparisons indicated no significant differences ($p > .05$) between these groups on any of the variables of interest. Therefore, given a lack of significant

differences and further low engagement by the group who did not complete any in-the-moment measures (n = 15), they were omitted from subsequent analyses.

Assumption Testing

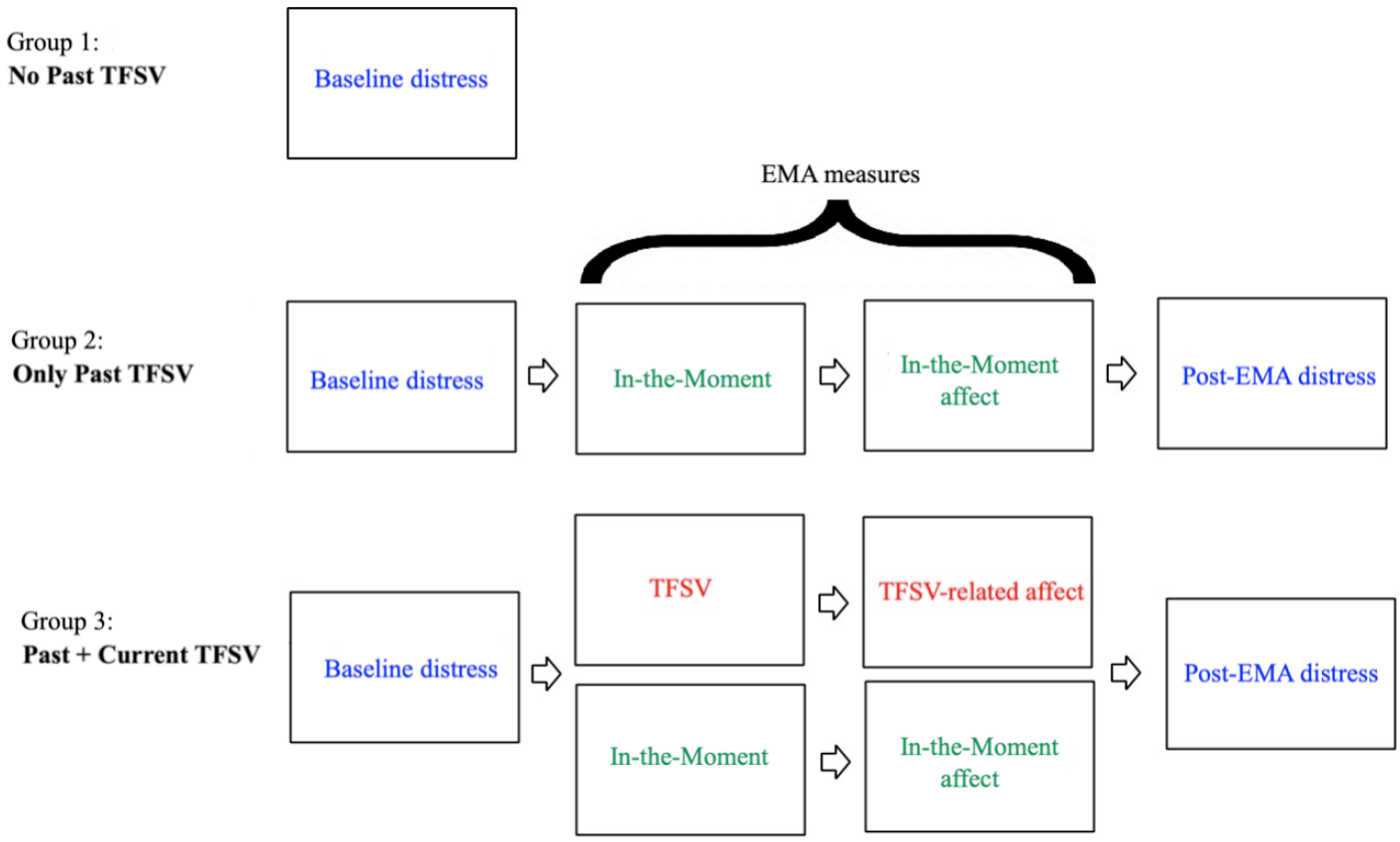
Prior to assumption testing, all item-level data across the three parts of the study were inspected for accuracy, with visual inspection and descriptive statistics revealing that all entries were plausible. After participant exclusions (as outlined above), a missing values analysis was run in SPSS to identify any patterns in missing data (IBM Corporation, 2022). In part one (pre-EMA), across primary measure items (i.e., TFSV and GHQ), there was less than 5% missing data, and six participants had more than 5% of their data missing (ranging from 9% to 27% missing). One participant (with 9% missing) did not complete three TFSV items, and another (with 12% missing) did not complete four TFSV items. One participant (with 9% missing) did not complete one TFSV and two GHQ items, while another (with 12% missing) did not complete three TFSV items and one GHQ item. One participant who completed parts two and three of the study did not complete one TFSV item and five GHQ items (with 18% overall missing). Finally, one participant did not complete 9 out of the 12 GHQ items (with 27% overall missing). Therefore, using the missing data strategy outlined above, they were omitted from those related analyses. Otherwise, given the large sample size in part one, this pattern of missing data was in line with what would be expected (Tabachnick & Fidell, 2018). In part two (EMA) and part three (post-EMA), there were no missing data across primary measures (i.e., TFSV and I-PANAS-SF items in part two; GHQ items in part three) or participants.

Groups based on TFSV experiences were created to examine the research questions. This included a “no TFSV” group for individuals who reported no TFSV experiences during part one of the study, the “only past TFSV” group for women who had historical TFSV but reported no

experiences during the EMA, and the "past + current TFSV" group who experienced TFSV both historically and during the EMA. For an outline of the measures obtained from each of these groups, see Figure 15.

Figure 15

Measures Collected from the Three Groups of Women Participants



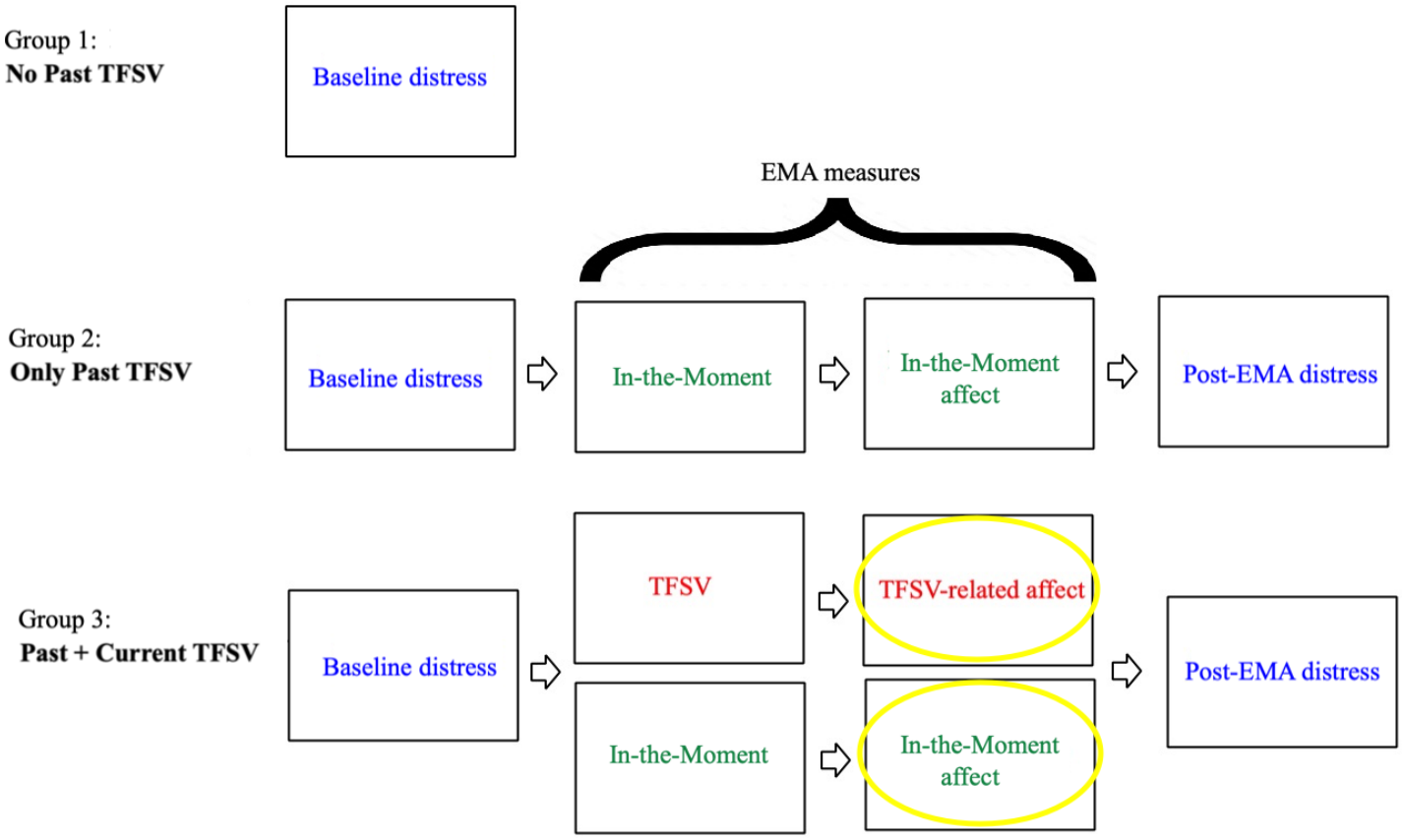
Note. This figure showcases the temporal order of measures and not the hypothesized causal sequence of variables.

Research Question One: Dependent Samples t-tests Model and Assumption Testing

To examine whether momentary affect was different after TFSV incidents compared to momentary affect after in-the-moment events, participants fell within the "past + current TFSV" group if they completed EMA measures for both the TFSV (condition #1) and in-the-moment (condition #2) conditions (n = 13). The I-PANAS-SF scores were then averaged from all events in these two conditions to form composite scores. This occurred for both positive and negative affect. These scores were then subjected to dependent samples t-tests. See Figure 16 for a visualization of the compared variables (as shown in yellow).

Figure 16

Measure Comparison for Affect After TFSV Incidents



Note. This figure is showcasing the temporal order of measures and not the hypothesized causal sequence of variables**.**

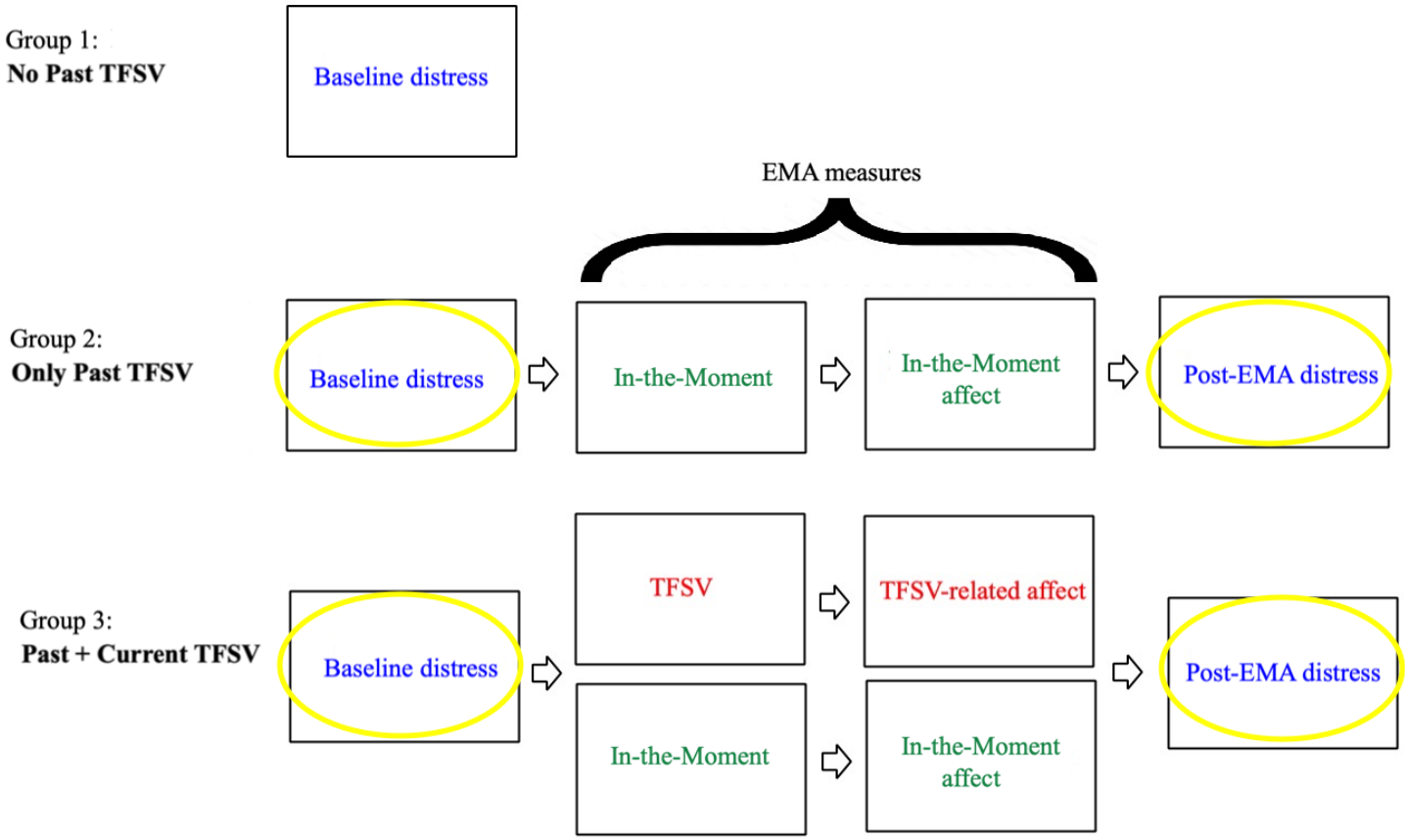
The assumptions for dependent samples *t*-tests were verified before hypothesis testing for research question one. The dependent variable (affect) was on a continuous scale, and the independent variable (event type [TFSV vs. in-the-moment]) was categorical and consisted of related groups. Participants were independent from one another. Descriptive statistics and visual inspection of histograms for differences between the related groups (for both positive and negative affect) revealed skewness (-.632 for positive; -.311 for negative) and kurtosis (-1.04 for positive; 0.57 for negative) scores near zero. Shapiro-Wilk ($p > .05$) also suggested that the differences were normally distributed. Through box plot inspection, no univariate outliers in the differences were detected.

Research Question Two: Independent Samples t-tests Model and Assumption Testing

To examine whether TFSV may change distress over time, participants were placed in either a "only past TFSV" or "past + current TFSV" group. Of the participants who participated in part three (post-EMA) and completed at least one in-the-moment measure during part two (EMA; $n = 19$), 14 (74%) did not report any experiences with TFSV (the only past TFSV group) and 5 (26%) reported at least one TFSV experience (the past + current TFSV group). For both groups, change scores were calculated by subtracting baseline GHQ distress scores from post-EMA GHQ distress scores. These change scores were then compared using an independent samples *t*-test. See Figure 17 for a visualization of the variables of interest (as indicated in yellow).

Figure 17

Measures for Comparing Changes in Distress Between Past TFSV and TFSV Groups



Note. This figure is showcasing the temporal order of measures and not the hypothesized causal sequence of variables.

The assumptions for independent samples *t*-tests were verified prior to hypothesis testing for research question two. The dependent variable (distress change score) was on a continuous scale, and the independent variable (TFSV group [past TFSV vs. current TFSV]) was categorical and consisted of unrelated groups. There were also independent observations across these groups. Descriptive statistics and visual inspection of histograms for distress change scores for the independent variable groups indicated skewness (0.36 for past TFSV; -0.38 for current TFSV)

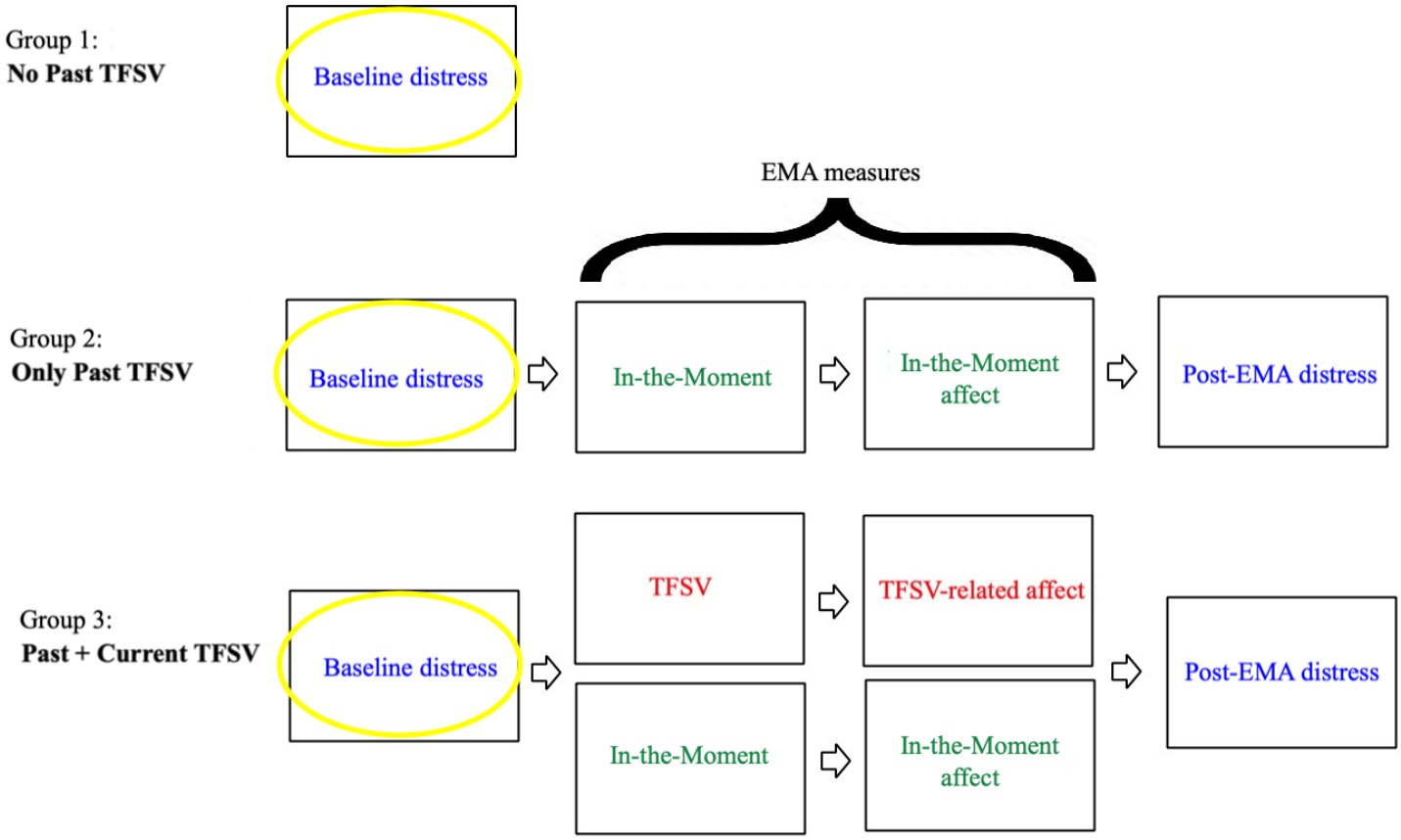
near zero. Shapiro-Wilk ($p > .05$) also suggested that the scores were normally distributed for each group. However, the kurtosis scores deviated from zero (-1.11 for only past TFSV and -2.99 for past + current TFSV), with the histograms indicating cases in the tails, particularly for the past + current TFSV group. Through box plot inspection, no univariate outliers were detected. For homogeneity of variance, Levene's Test for Equality of Variances was not significant ($p > .05$) across the two independent variable groups, indicating that the assumption of equal variances was met. Given the small sample sizes, particularly for the past + current TFSV group ($n = 5$), and the high likelihood of a resulting effect on the normality of the distribution, the *t*-test was still conducted.

Research Question Three: One-Way Analysis of Variance Model and Assumption Testing

For research question four, whether distress may serve as a vulnerability factor for TFSV, the three groups of participants were compared. Again, one group, the "no TFSV" group reported no experiences of TFSV during part one. The "only past TFSV" group consisted of participants who enrolled in part two (the EMA portion of the study) and did not report any experiences of TFSV. Finally, the "past + current TFSV" group reported experience(s) of TFSV during both part one and two. After exclusions (for missing data and women who did not complete at least one in-the-moment event in the EMA portion, as outlined above), 25 (41%) participants were placed in the no TFSV group, 24 (39%) participants were placed in the past TFSV group, and 12 (20%) were placed in the TFSV group. Baseline distress scores were then compared using a one-way ANOVA. Please see Figure 18 for a visual of the variables of interest for this analysis (as shown in yellow).

Figure 18

Measures for Examining Distress as a Vulnerability Factor for TFSV



Note. This figure is showcasing the temporal order of measures and not the hypothesized causal sequence of variables.

The assumptions for a one-way ANOVA were then verified prior to hypothesis testing for research question four. The dependent variable (baseline distress) was on a continuous scale, and the independent variable (TFSV group [no TFSV vs. only past TFSV vs. past + current TFSV]) was categorical. There was also an independence of observations. Descriptive statistics and visual inspection of histograms for each group revealed skewness and kurtosis scores near zero. Shapiro-Wilk ($p > .05$) also suggested that group GHQ scores were normally distributed,

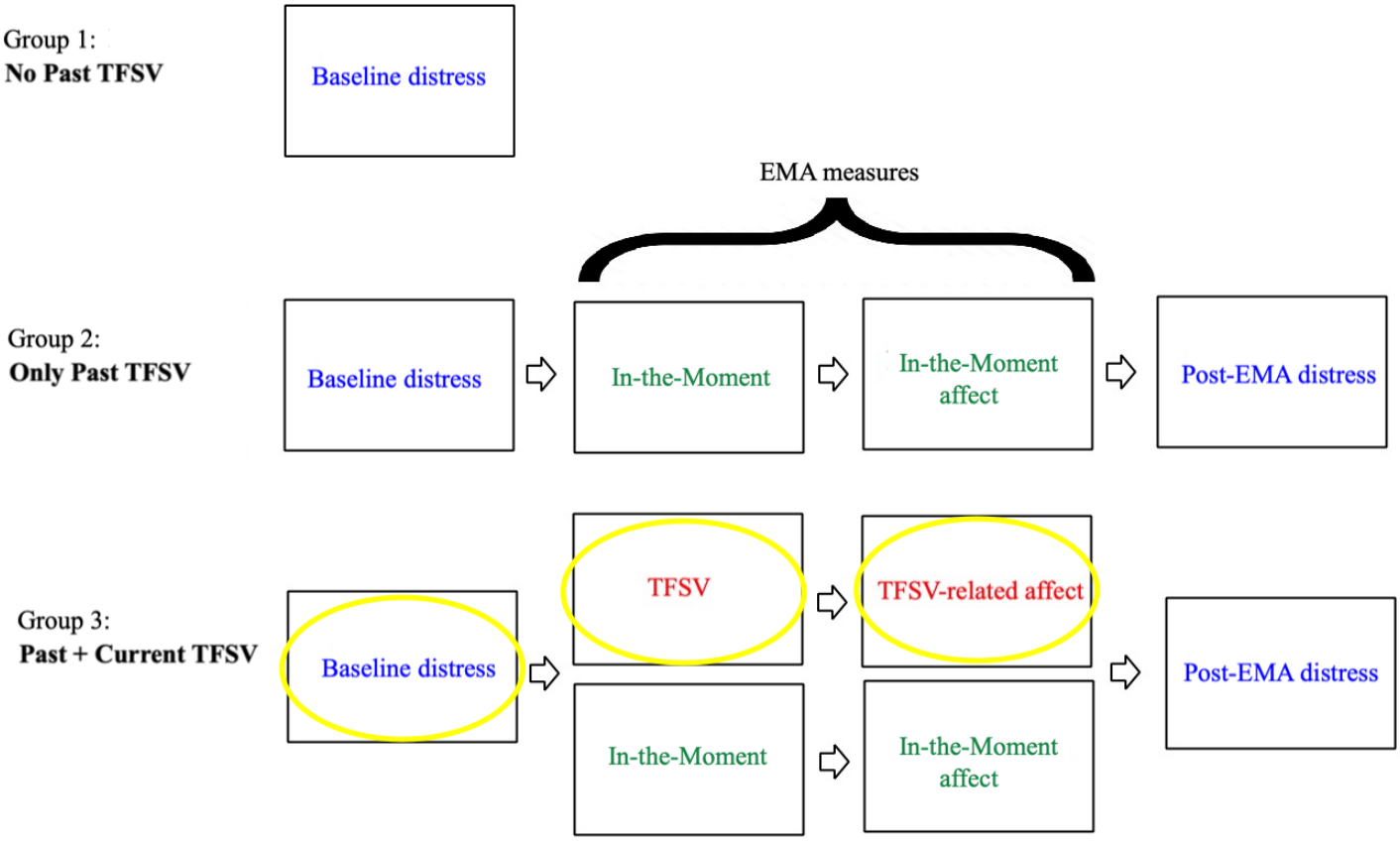
and, through box plot inspection, univariate outliers were not detected for any of the groups. Levene's test of homogeneity of variances revealed no significant ($p > .05$) differences between the groups.

Research Question Four: Correlation Analysis Model and Assumption Testing

Correlation analyses were used to examine the hypothesized moderation effect of baseline distress on a potential relationship between TFSV and TFSV-related affect in the TFSV group ($n = 12$). This approach was favoured over a regression-based approach because of the small sample size. Five correlations were performed between the number of TFSV events (as experienced during Part 2 [EMA]) and each of the average scores for TFSV-related *positiv*e affect (during EMA), average TFSV-related *negative* affect (during EMA), and baseline distress (pre-EMA), as well as between baseline distress and both positive and negative affect averages. For a visualization of these variables (in yellow), see Figure 19.

Figure 19

Measures for Investigating the Effect of Baseline Distress on TFSV-Related Affect



Note. This figure is showcasing the temporal order of measures and not the hypothesized causal sequence of variables.

For Pearson product-moment correlations, the primary assumptions were met, which include that variables are measured continuously, there are linear relationships between variables, no significant outliers, and the variables are approximately normally distributed (Tabachnick & Fidell, 2018). Homoscedasticity was also evaluated. Histograms were visually inspected along with skewness and kurtosis scores when testing for normality, with standardized z-scores (in excess of 3.29) used to identify univariate outliers (Tabachnick & Fidell, 2018).

Multivariate outliers were examined using Mahalanobis Distance (MD), with an alpha level of .001 (for the probability estimate) when compared to a chi-square distribution (Tabachnick & Fidell, 2018). Scatterplots were used to visually inspect for linearity and residual scatterplots were used to inspect for homoscedasticity.

All variables (TFSV events, baseline distress, and TFSV-related positive and negative affect) were on a continuous scale. For normality, skewness and kurtosis scores were near zero for baseline distress and negative affect scores. The positive affect variable had a skewness of 1.65 and kurtosis of 1.78, whereas TFSV events had skewness near zero but a kurtosis of -1.36. Shapiro-Wilk ($p > .05$) suggested normal distributions for baseline distress and negative affect and a non-normal distribution for TFSV events ($p = .04$) and positive affect ($p = .003$). Visual inspection of histograms revealed a slight U-shaped distribution for TFSV events and cases at the upper tail for positive affect. These constituted participant scores of 19 and 20.50 on the positive affect scale ($M = 6.58$, $SD = 6.46$). However, no univariate or multivariate outliers were identified across the variables or variable combinations through standardized z-scores and MD.

Through visual inspection of scatterplots, linearity was observed between baseline distress and negative affect, as well as TFSV events and both affect variables. Linearity was also observed between baseline distress and positive affect, particularly when the two upper tail cases for positive affect were omitted. Linearity was not observed between baseline distress and number of TFSV events. Residual scatterplots provided evidence of homoscedasticity across all variable combinations. Given the plausibility that the two upper tail cases for positive affect represent unique cases in the dataset that are still within the population of interest and that their standardized scores did not exceed +/-3.96, these cases were retained for analysis. However, given the violations to normality (for positive affect and TFSV events) and linearity between

baseline distress and both positive affect and TFSV events, as well as the overall small sample size, results should be interpreted cautiously. Results are viewed as ultimately providing descriptive information rather than inferential.

Results

Enrollment and Attrition

Of the total sample size before exclusions ($N = 264$), 33 (13%) individuals reported not experiencing TFSV in the last two years. Therefore, only 231 participants were eligible to participate in part two (EMA) of the study based on having past experiences of TFSV. Of these participants, 81 (35% of the 231) participants were invited to participate, and 55 (representing a 32% attrition rate) enrolled in the EMA. One participant was invited to participate but could not enroll due to an incompatibility between their Android smartphone and the SEMA^3 operating system.

Comparisons were conducted between those who enrolled in part two ($N = 55$) and those who did not but were eligible ($n = 176$) in demographic factors, TFSV, and GHQ to deduce whether there may have been any meaningful differences. There were no significant differences ($p > .05$) between participants who did and did not enroll in age, gender diversity, racial minority status, disability status, marital status, highest level of completed education, TFSV, or GHQ. However, these groups were significantly different in sexual diversity (χ^2 [1] = 4.73, $p < .05$, Cramer's $V = .144$). More women with diverse sexual orientations participated in part two of the study than was expected, with fewer heterosexual women partaking in part two than was expected. This difference was also maintained when the gender diverse participants ($n = 9$) were excluded.

Demographic and primary measure comparisons were also completed between participants who participated in part two (EMA) and part three (post-EMA; $n = 25$) versus those who participated in part two but did not complete part three ($n = 27$). There were no significant differences ($p > .05$) between these participants in age, racial minority status, sexual diversity, disability status, marital status, highest level of completed education, TFSV, or GHQ.

Primary Measure Characteristics

The psychometric properties of the primary scales used in each part of this study are presented in Table 6.

Table 6

Primary Measure Characteristics

Measure	Sample Size (*n*)	Mean	Standard Deviation	Internal Consistency
Part One: Pre-EMA				
TFSV Victimization Scale[a]	244	8.39	8.19	.89
General Health Questionnaire (GHQ)	243	17.32	5.08	.83
Part Two: During EMA				
I-PANAS-SF – Negative Affect Only; TFSV Condition #1	48	10	7.67	.90
I-PANAS-SF – Positive Affect Only; TFSV Condition #1	48	10.58	8.24	.90
I-PANAS-SF – Negative Affect Only; In-The-Moment Condition #2	78	4.42	5.62	.86

I-PANAS-SF – Positive Affect Only; In-The-Moment Condition #2	78	8.21	6.35	.87
Part Three: Post-EMA				
General Health Questionnaire (GHQ)	27	18.30	6.50	.89

Note. TFSV = Technology-Facilitated Sexual Violence. I-PANAS-SF = International Positive and Negative Affect Schedule Short Form.

[a]An additional item was added to this scale, as outlined in the Measures section.

Descriptive Statistics

Part One: Pre-Ecological Momentary Assessment (EMA)

Of women participants who reported having experienced TFSV in part one of the study (n = 225), the types of TFSV behaviours they experienced are outlined in Table 7.

Table 7

Participant (n = 225) Experiences of TFSV Behaviours Pre-EMA

Type of TFSV[a]	Frequency (% of sample [n = 225])[b]				
	Never	Less than monthly	Monthly	Weekly	Daily
Sexual harassment	67 (30%)	104 (46%)	38 (17%)	13 (6%)	2 (1%)
Sent sexually explicit images, comments, emails, or text messages	42 (19%)	116 (52%)	56 (25%)	9 (4%)	2 (1%)
Partner checking up on location	92 (41%)	44 (20%)	20 (9%)	39 (17%)	28 (12%)
Sent unwanted sexual requests	56 (25%)	109 (48%)	39 (17%)	18 (8%)	3 (1%)

Partner gained access to online accounts	191 (85%)	23 (10%)	4 (2%)	4 (2%)	2 (1%)
Offensive sexual comment posted publicly	181 (80%)	31 (14%)	9 (4%)	2 (1%)	1 (<1%)
Personal details posted saying available for sex	196 (87%)	24 (11%)	2 (1%)	0 (0%)	2 (1%)
Pressured into sending nudes	126 (56%)	70 (31%)	20 (9%)	7 (3%)	2 (1%)
Nudes take without permission	194 (86%)	29 (13%)	2 (1%)	0 (0%)	0 (0%)
Nudes posted/sent without permission	199 (88%)	22 (10%)	3 (1%)	0 (0%)	0 (0%)
Nudes threatened to be posted/sent	200 (89%)	21 (9%)	3 (1%)	1 (<1%)	0 (0%)
Image/video taken of unwanted sexual experience	211 (94%)	9 (4%)	4 (2%)	0 (0%)	1 (<1%)
Image/video posted of unwanted sexual experience	211 (94%)	10 (4%)	1 (<1%)	0 (0%)	1 (<1%)
Image/video threatened to be posted of unwanted sexual experience	211 (94%)	13 (6%)	1 (<1%)	0 (0%)	0 (0%)
Unwanted sexual experience in-person with someone met online	186 (83%)	32 (14%)	4 (2%)	2 (1%)	1 (<1%)
Unwanted sexual experience in-person with someone met on dating app	178 (79%)	37 (16%)	8 (4%)	2 (1%)	0 (0%)
Gender-based offensive/degrading messages or comments	105 (47%)	78 (35%)	28 (12%)	11 (5%)	2 (1%)
Sexuality-based offensive/degrading messages or comments	147 (65%)	55 (24%)	14 (6%)	8 (4%)	0 (0%)
Sexually violent threats	188 (84%)	31 (14%)	5 (2%)	1 (<1%)	0 (0%)
Unwanted sexual act against avatar or game character	189 (84%)	26 (12%)	4 (2%)	4 (2%)	1 (<1%)

Unwanted sexual act against you via website/email/messages	159 (71%)	54 (24%)	6 (3%)	6 (3%)	0 (0%)
Any behaviours repeated	168 (75%)	41 (18%)	10 (4%)	5 (2%)	1 (<1%)

[a]TFSV behaviours are shortened here for brevity. See Appendix E for full item content.

[b]Frequency over the past two years.

Part Two: Ecological Momentary Assessment (EMA)

There were 48 incidents of TFSV reported by 19 (33% of those 52 enrolled) participants in the EMA portion of the study. Of these 19 participants, six (32%) reported one TFSV incident, seven (37%) reported two incidents, one (5%) reported three incidents, two (10%) reported four incidents, two (10%) reported five incidents, and one (5%) reported seven incidents throughout the study. See Table 8 for reported frequencies of TFSV behaviours.

Table 8

TFSV Behaviours Experienced During the EMA

Type of TFSV[a]	Frequency of Incidents (% of *n* = 48)
Sexual harassment	7 (15%)
Sent sexually explicit images, comments, emails, or text messages	19 (40%)
Partner checking up on location	9 (19%)
Sent unwanted sexual requests	3 (6%)
Offensive sexual comment posted publicly	2 (4%)
Image/video taken of unwanted sexual experience	1 (2%)

Gender-based offensive/degrading messages or comments	2 (4%)
Sexuality-based offensive/degrading messages or comments	1 (2%)
Sexually violent threats	1 (2%)
Unwanted sexual act against avatar or game character	1 (2%)
Unwanted sexual act against you via website/email/messages	1 (2%)
Any behaviours repeated	1 (2%)

During the EMA, participants experienced TFSV across different locations and from different perpetrators, aside from blogs, internet forums, phone calls, family members, past intimate partners, schoolmates, or work associates. Nearly half of incidents occurred on social media/news platforms (44%) and from strangers (46%). See Table 9 for a breakdown of the different locations by different perpetrator types.

Table 9

Perpetrators and Locations of TFSV Behaviours During the EMA

Locations/ Perpetrators	Blogs	Chat Applications	Dating Applications	Emails	Internet Forums	Phone Calling	SMS Text Messaging	Social Media/News	Video Conferencing	Video Game Platforms	**Totals**
Acquaintance	0 (0%)	1 (<1%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	1 (<1%)	5 (9%)	1 (<1%)	1 (<1%)	**9 (17%)**
Current Intimate Partner	0 (0%)	7 (13%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	**7 (13%)**

Family Member	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	**0 (0%)**
Friend	0 (0%)	5 (9%)	1 (<1%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	2 (<1%)	1 (<1%)	1 (<1%)	**10 (19%)**
Friend with Benefits	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	1 (<1%)	1 (<1%)	1 (<1%)	**3 (1%)**
Past Intimate Partner	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	**0 (0%)**
School Mate	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	**0 (0%)**
Stranger	0 (0%)	3 (1%)	0 (0%)	1 (<1%)	0 (0%)	0 (0%)	0 (0%)	16 (30%)	0 (0%)	5 (9%)	**25 (46%)**
Work Associate	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	**0 (0%)**
Totals	**0 (0%)**	**16 (30%)**	**1 (<1%)**	**1 (<1%)**	**0 (0%)**	**0 (0%)**	**1 (<1%)**	**24 (44%)**	**3 (1%)**	**8 (15%)**	**54[a] (100%)**

[a]Participants (N = 19) could select as many locations or perpetrators as applicable for each (n = 48) incident.

Hypothesis Testing

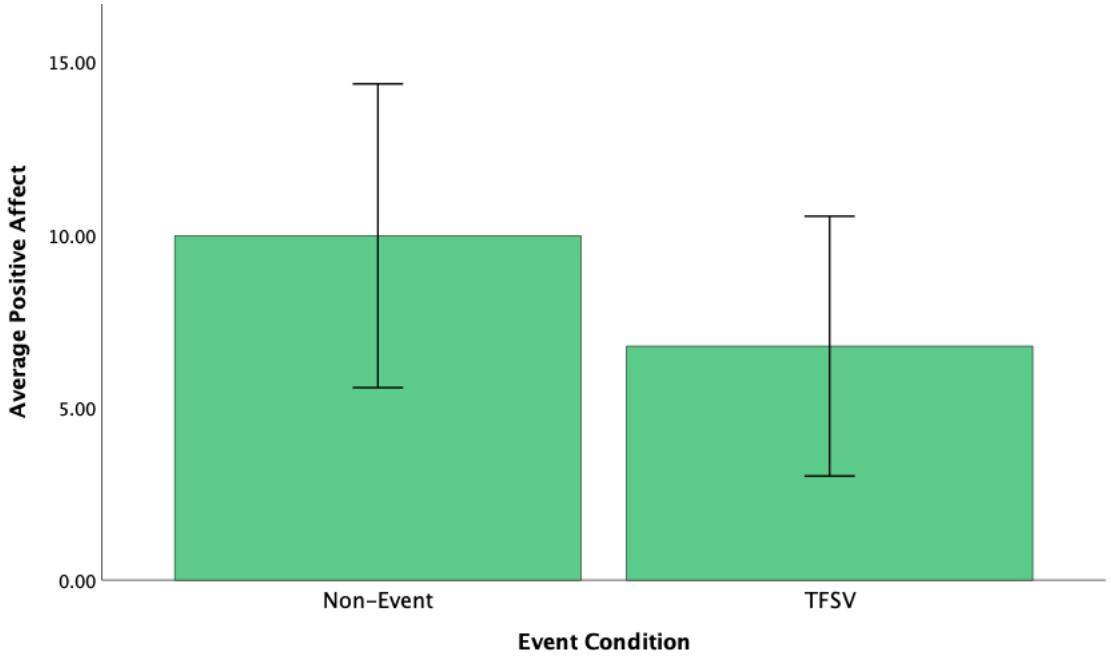
Research Question One: Affect After TFSV

To examine whether momentary affect differs after TFSV incidents compared to momentary affect after in-the-moment events, dependent samples *t*-tests were conducted comparing TFSV-related positive and negative affect to in-the-moment positive and negative affect in the TFSV group. The results of the dependent samples *t*-tests indicated that there were no significant differences ($p > .05$) between positive ($t[12] = -1.49$, $p = .163$) or negative affect ($t[12] = 1.37$, $p = .197$) experienced by participants after TFSV events compared to in-the-

moment events. However, means were trending in the hypothesized direction, with positive affect achieving a mean of 6.77 (*SD* = 6.22) after TFSV events and in-the-moment events achieving a mean of 9.96 (*SD* = 7.27; see Figure 20). Furthermore, negative affect achieved a mean of 9.05 (*SD* = 6.37) after TFSV events, with in-the-moment events achieving a mean of 6.79 (*SD* = 5.97; see Figure 21).

Figure 20

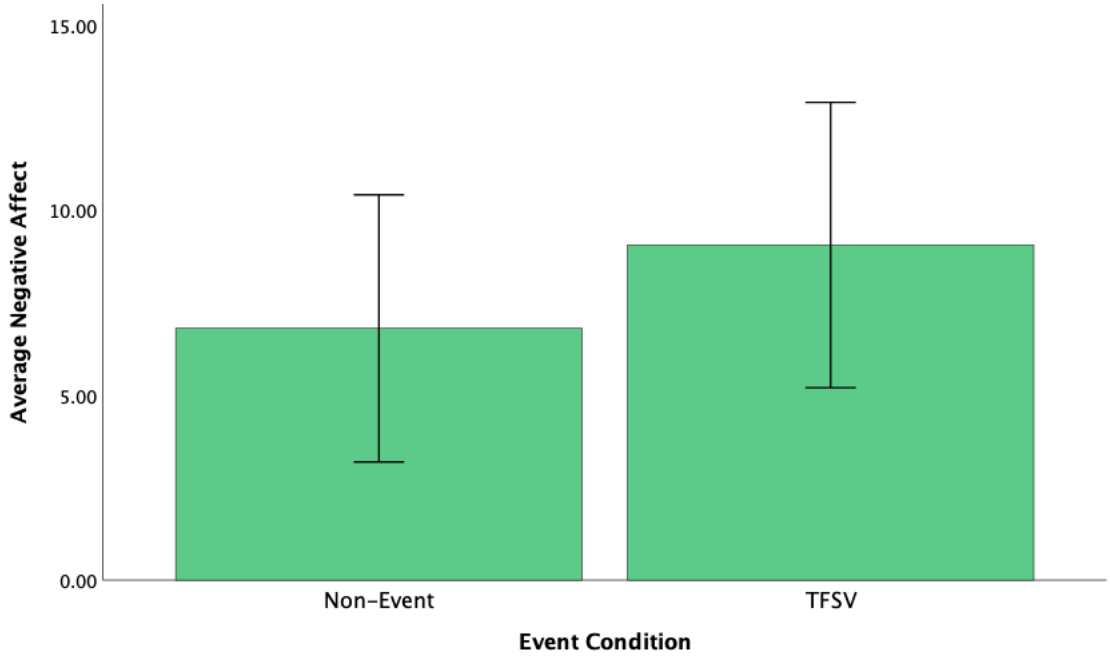
Positive Affect Mean Comparison Between Event Conditions #1 and #2 for the TFSV Group



Note. 95% error bars are included in the figure.

Figure 21

Negative Affect Mean Comparison Between Event Conditions #1 and #2 for the TFSV Group



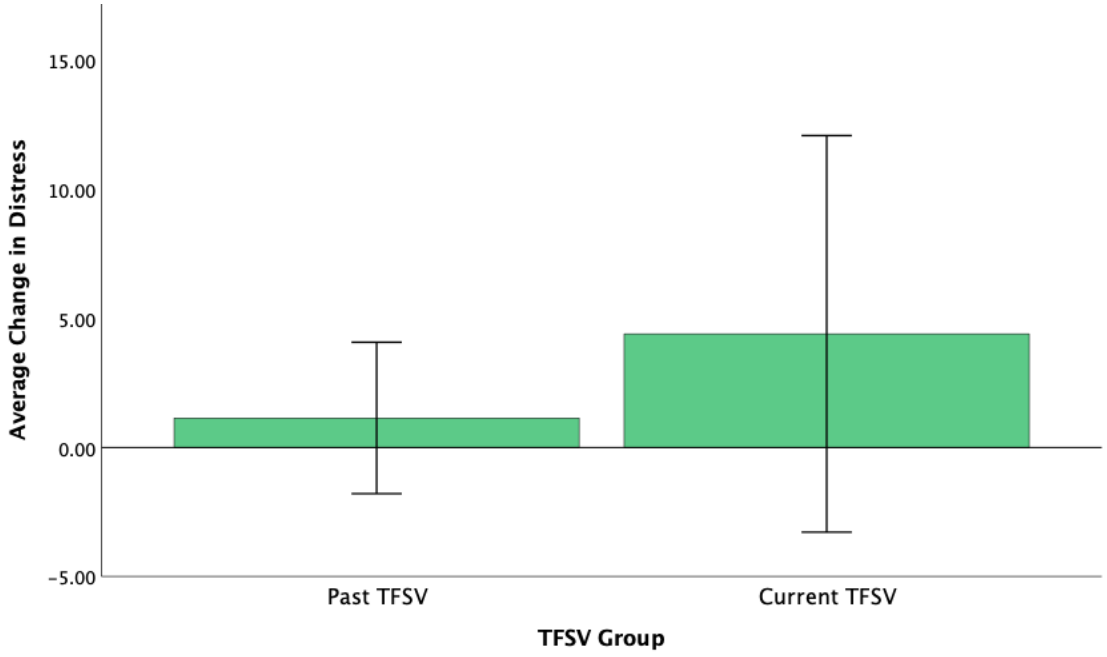
Note. 95% error bars are included in the figure.

Research Question Two: Distress Changes After TFSV

To examine whether TFSV may change distress over time, an independent samples *t*-test was used to compare the past TFSV group's change in distress over the study period to the TFSV group. The results indicated that there were no significant differences ($p > .05$) between distress change scores for the past TFSV and TFSV groups ($t[17] = 1.17$, $p = .26$). Nonetheless, means were in the hypothesized direction for change scores for the past TFSV group ($M = 1.14$, $SD = 5.08$) and TFSV group ($M = 4.40$, $SD = 6.19$). See Figure 22 for a visualization of these means.

Figure 22

Mean Change Distress Score Comparison Between TFSV Groups



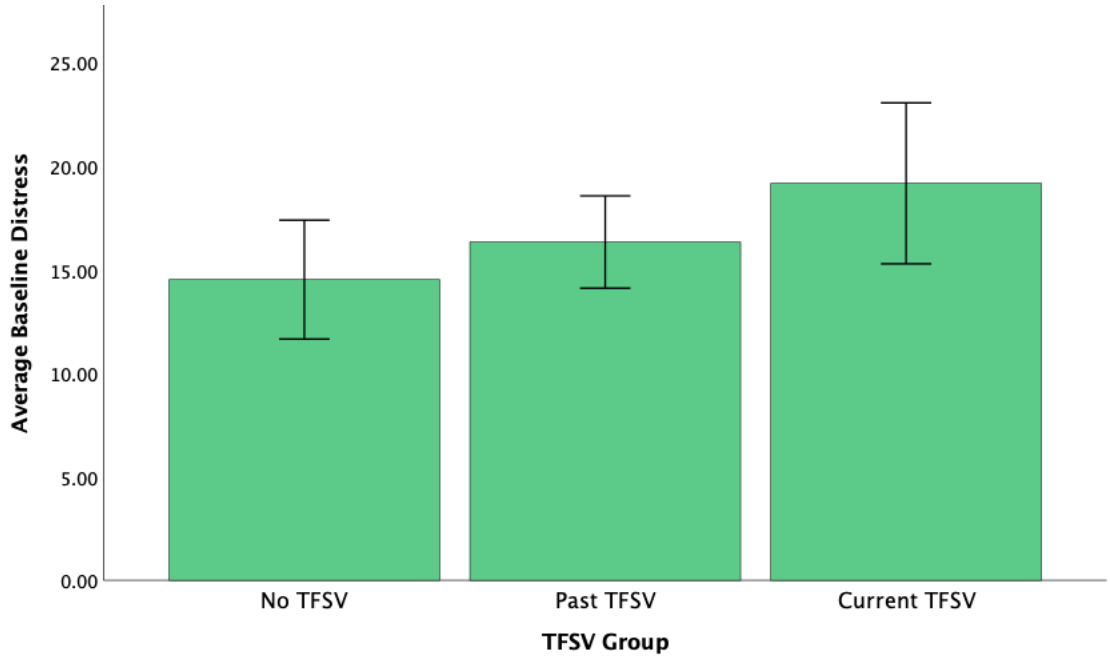
Note. 95% error bars are included in the figure.

Research Question Three: Distress as a Vulnerability Factor for TFSV

To understand whether distress may serve as a vulnerability factor for TFSV, baseline distress scores were compared among the no TFSV, past TFSV, and TFSV groups using a one-way ANOVA. The ANOVA revealed no significant differences between the groups in baseline GHQ distress scores ($F(2, 58) = 2.31$, $p = .11$). However, means were trending in the hypothesized direction, with the no TFSV group yielding a mean of 14.52 ($SD = 6.96$), the past TFSV group yielding a mean of 16.33 ($SD = 5.28$), and the TFSV group yielding a mean of 19.17 ($SD = 6.12$). See Figure 23 for a visualization of these means.

Figure 23

Baseline Distress Mean Comparison Between TFSV Groups



Note. 95% error bars are included in the figure.

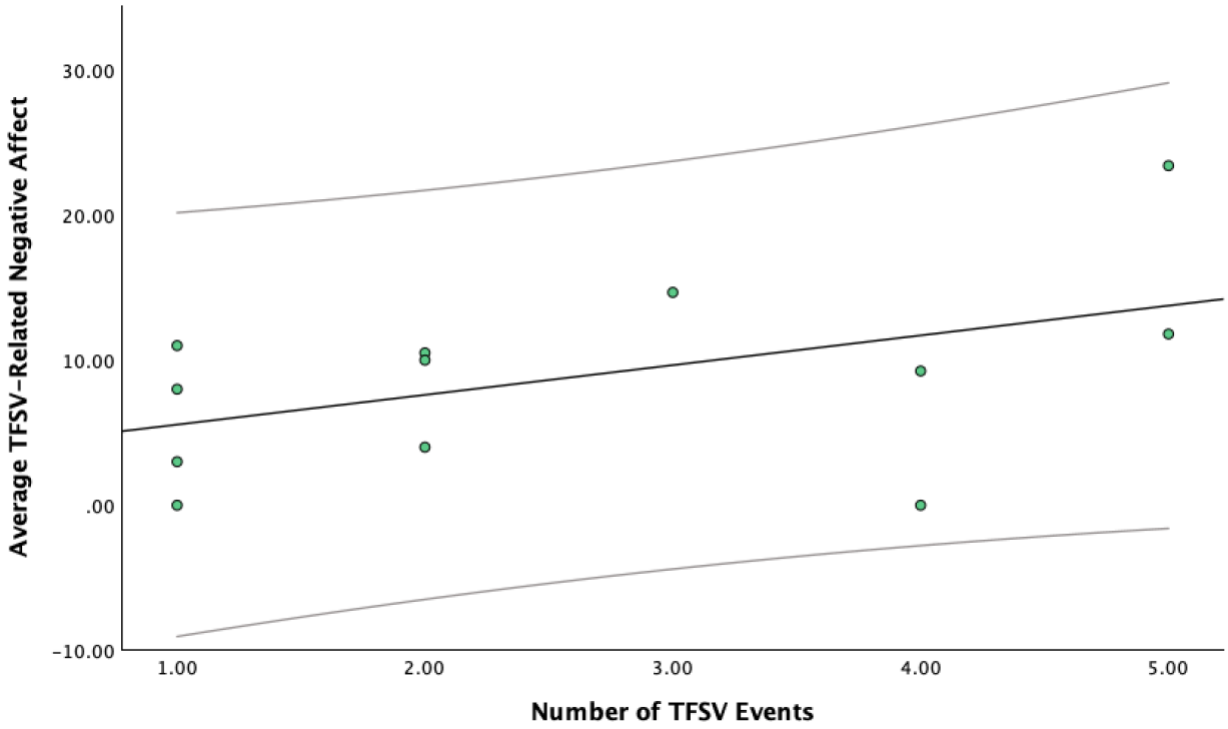
Research Question Four: Moderation Effect of Distress on Relationship Between TFSV Events and TFSV-Related Affect

Pearson correlations were conducted to examine a possible moderating effect of baseline distress on a potential relationship between TFSV events and TFSV-related affect in the TFSV group. As previously outlined in the assumption testing section, these results should be interpreted with caution given the small sample size and an indication of violations to the assumptions related to linearity and normality.

A significant positive relationship between baseline distress and TFSV-related negative affect was revealed ($r[10] = .66$, $p = .02$, 95% confidence interval [CI] = .15 to .90). A significant relationship was also indicated between TFSV events and positive affect ($r[10] = .67$, $p = .02$, CI = .15 to .90). No other significant ($p > .05$) relationships between the variables were revealed. See Figures 24 through 28 for a visual of these relationships.

Figure 24

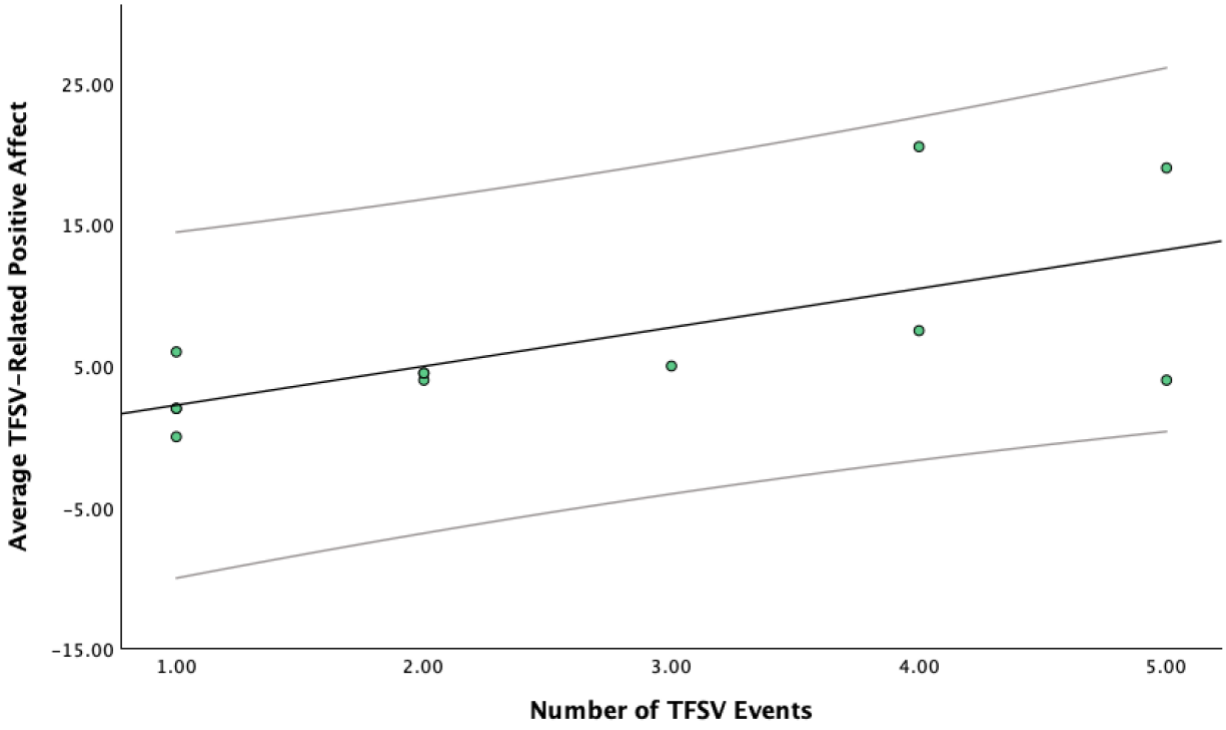
The Relationship Between TFSV Events and TFSV-Related Negative Affect



Note. This was not a significant correlation ($p > .05$). Individual 95% error bars are represented with the grey lines.

Figure 25

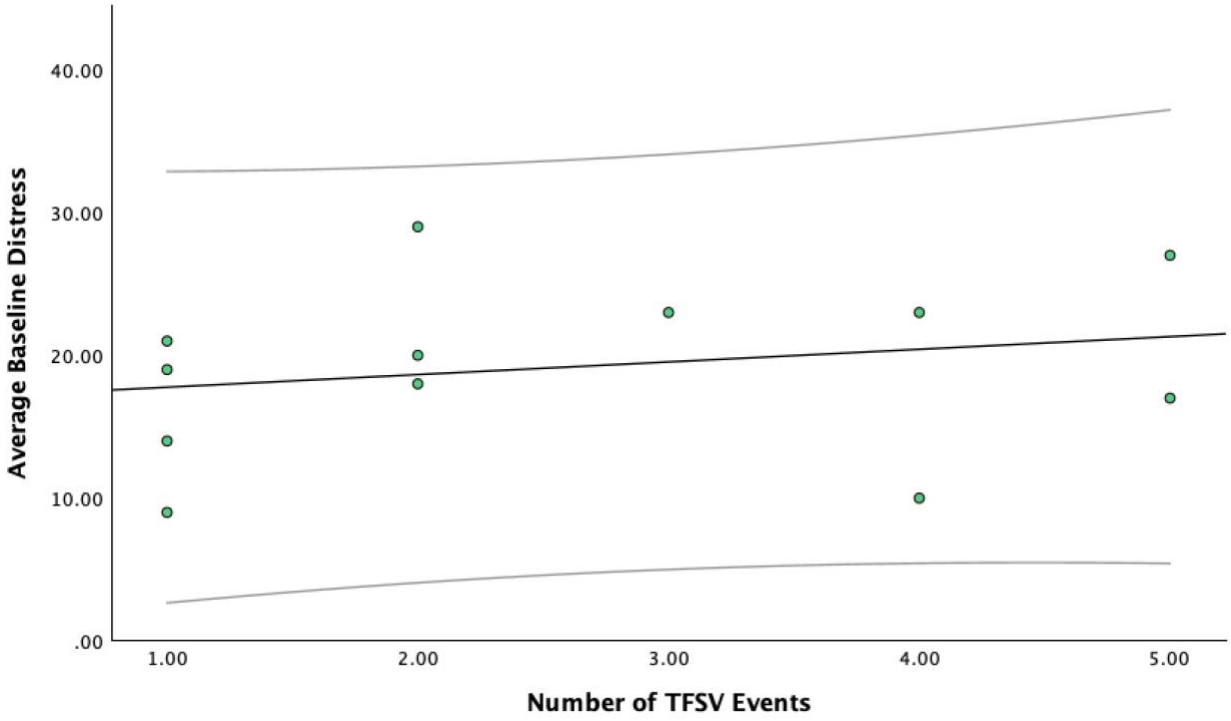
The Relationship Between TFSV Events and TFSV-Related Positive Affect



Note. This was a significant correlation ($p < .05$). Individual 95% error bars are represented with the grey lines.

Figure 26

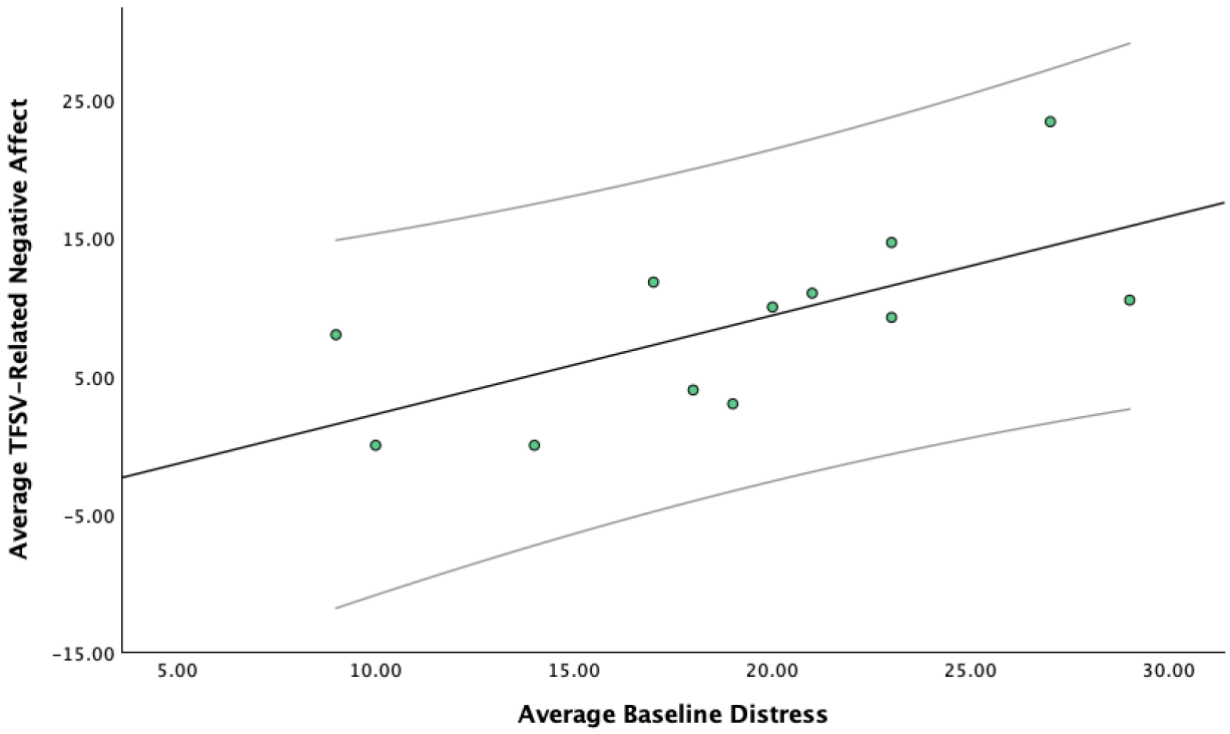
The Relationship Between TFSV Events and Baseline Distress



Note. This was not a significant correlation ($p > .05$). Individual 95% error bars are represented with the grey lines.

Figure 27

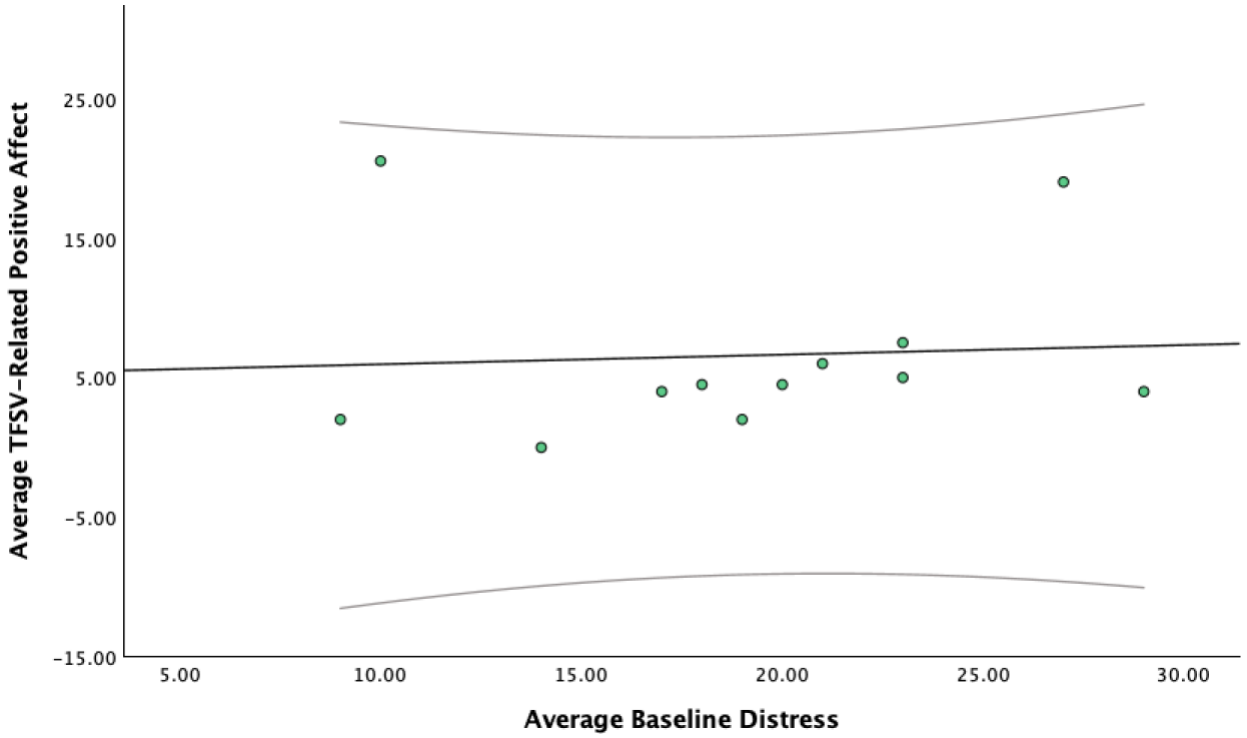
The Relationship Between Baseline Distress and TFSV-Related Negative Affect



Note. This was a significant correlation ($p < .05$). Individual 95% error bars are represented with the grey lines.

Figure 28

The Relationship Between Baseline Distress and TFSV-Related Positive Affect



Note. This was not a significant correlation ($p > .05$). Individual 95% error bars are represented with the grey lines.

Study Two Discussion

This study is the first known project to use an ecological momentary assessment (EMA) paradigm to investigate the topic of technology-facilitated sexual violence (TFSV) in women. Specifically, TFSV was examined to understand whether these experiences may be related to negative mental health. Although various challenges were faced while using this design, including difficulty in achieving an adequate sample size across study parts, early data trends suggest that TFSV may influence victims' negative and positive affect. Furthermore, distress may change over time due to TFSV experiences, and it may also serve as a vulnerability factor

for TFSV, showcasing the (likely) complexity of these variable relationships. Due to sample size restraints on the investigative power, whether baseline distress may also influence the relationship between TFSV events and affect is unknown. Thus, this is a ripe area for future examination.

While the hypothesized results were found to be not statistically significant, it is worth pointing to the mounting body of correlational evidence that suggests the potential existence of a causal relationship between TFSV experiences and negative mental health (e.g., Cripps & Stermac, 2018; Douglass et al., 2018; Patel & Roesch, 2020; Snaychuk & O'Neill, 2020). However, an additional consideration is introduced by the current research, which elucidates how distress, affect, and TFSV are unlikely to have simple unidirectional relationships and linear causal influences of one variable on another. Instead, there are likely many factors, including predispositions and context, that contribute to complex multidirectional relationships between these variables. For instance, in research on post-traumatic stress disorder (PTSD), those who have cumulative traumas tend to be more vulnerable to developing PTSD and other conditions, which point to increased emotionality (e.g., Cloitre et al., 2019). Within TFSV, there are likely cases where past traumatic experiences cause women to become more vulnerable to negative emotionality during TFSV than others. It may also be important to consider the type of violence, as some TFSV behaviours may be more emotionally salient than others. So, while we have yet to understand these relationships more definitively, these results provide some early evidence of their potential existence, and now, the added complexity involved for achieving a comprehensive understanding is illuminated. This can start to build a foundation for if, when, and how psychological interventions could benefit victims.

This study's EMA design and use of the Sema[3] smartphone application (O'Brien et al., 2024) was a novel approach to examining TFSV. This methodology was chosen to reduce ethical concerns associated with using rigorous experimental paradigms (e.g., randomly assigning women to experience TFSV or not) for evaluating casual relationships. Although this provided a snapshot of possible broader trends, this study was limited in generating firm conclusions. Therefore, in the future, it would be valuable to undergo this research using a similar EMA methodology with more resources paid to the recruitment and retention of participants. These sorts of designs, while powerful, are resource-intensive, particularly when variables of interest (e.g., TFSV) have a low base rate. Attritions rates can also be challenging to predict, and in this study, was slightly higher than expected, at 32%. This may have been partially driven by participants' motivation to receive bonus points for part one of the study, leading to their disengagement when they had received their remuneration. A different remuneration schedule that incentivizes longer-term engagement may be useful for participant retention.

Furthermore, though the use of a smartphone application was an asset for employing the EMA, it is not without recognition that this very medium was the method under investigation for its role in facilitating violence. Thus, some women may not have been captured in this study, including those who may have decided to abstain from using technology because of their TFSV experiences. Future EMA studies may wish to recruit and retain participants in person using paper materials to expand the women sampled in future investigations on TFSV. Given early evidence suggesting the potential for victims to experience psychological consequences of TFSV, in the next and final study in this series, the "aftermath" of the violence is examined and, specifically, *how* women might cope with the violence.

Study Three: Qualitative Investigation

Study Three was the last in the sequence of studies for this dissertation. It builds on the findings of Study One and Study Two by focusing on victims' coping. Specifically, it adds a foundation for understanding how victims may deal with the consequences of TFSV, as investigated in Study Two, through coping strategies. This is with the continued note that victims' coping, which may or may not result in negative outcomes, does not ascribe any blame to victims for the TFSV they experience.

Research Questions

This qualitative study sought to answer the following questions:

1. What risk avoidance strategies do women employ after experiencing TFSV?
2. What are the benefits for women who employ risk avoidance strategies?
3. What are the consequences that women experience after employing these strategies?

Methodology

Participants

Based on a pragmatic rationale rather than the concept of data saturation, which has been highly criticized in the literature (e.g., Braun & Clarke, 2016; Vasileiou et al., 2018), and as guided by Braun and Clarke's (2013) suggested range of 6 to 10 participants for interview-based studies, 10 women students from Lakehead University were enrolled in this study. Note that women were asked to self-select in response to the advertisement (i.e., "*Do you identify as a woman, and have you had an experience receiving unwanted sexual attention or contact through technology in the last month?"*). Given the intersectional lens of the project, women who identified as minorities were specifically targeted for this study by advertising the inclusivity of the research. To obtain a final sample size of 10, 71 women were initially recruited through

Lakehead's online course credit system. Of these women, 40 (56%) reported experiencing an incident of TFSV within the last month, which was an eligibility criterion. Of these women, 17 (43%) expressed interest in being interviewed, and 10 (25%) went on to enroll in the study, representing the first of the 17 who responded to researcher recruitment inquiries. See Table 10 for an overview of participant demographic information. Participants elected to receive one bonus course credit or a $25 electronic gift card to a location of their choosing for their participation.

Table 10

Participant Demographic Information

Characteristic		Total Sample ($N = 10$)[a]
Mean Age (*SD*)		19.80 (1.81)
Gender[b]		
	Woman	10 (100%)
Sexual Orientation[b]		
	Bisexual	1 (10%)
	Heterosexual	6 (60%)
	Pansexual	2 (20%)
	Queer	1 (10%)
	Questioning	1 (10%)
Racial, Ethnic, and/or Cultural Background[b]		
	African	1 (10%)
	Caribbean	1 (10%)
	East/Southeast Asian	1 (10%)
	Indigenous	2 (20%)
	South Asian	1 (10%)
	White	4 (40%)
Disability Status		
	Yes	2 (20%)
	No	8 (80%)
Highest Level of Education		

	Highschool completed	4 (40%)
	Some undergraduate training	5 (50%)
	Undergraduate degree completed	1 (10%)
Student Status[b]		
	Full-time	10 (100%)
Mean Current Grade Point Average (*SD*)		77.90 (10.98)
Employment Status		
	Employed (full-time or part-time)	8 (80%)
	Unemployed	2 (20%)
Family of Origin Income		
	$10,001-$24,999	2 (20%)
	$25,000-$49,999	2 (20%)
	$75,000-$99,999	2 (20%)
	$100,000-$124,999	1 (10%)
	$175,000-$199,999	1 (10%)
	$200,000-$249,999	1 (10%)
	$300,000 or more	1 (10%)
Marital Status		
	Single	7 (70%)
	Committed relationship	3 (30%)

[a]Due to the loss of one participant's transcript post-interview, only nine participants' interview data were analyzed in this study. However, the demographic information for all 10 are presented in the table.

[b]Participants were able to select multiple options, so percentages may not sum to 100%.

Procedure

Pre-Interview

Women who agreed to participate in this study were provided with the information letter and consent form through the SurveyMonkey platform before meeting for the interview (please see Appendices B, W, and X for all forms used in this study). Basic demographic information was also collected (see Appendix F). Prospective participants were provided the option to engage in an in-person or virtual interview (i.e., using the Zoom platform). They were informed that if

the interview took place through Zoom, recording (i.e., auto transcription) features would be enabled. Participants were encouraged to connect with the interviewer to ask any questions they might have prior to participating in the interview process. Once participants provided consent to participate, they were asked about the days/times that they were available, and the researcher connected with them via email to confirm scheduled times. These emails were stored separately from all participant data and were deleted after the interviews were completed. All participants ($N = 10$) scheduled a Zoom interview and were sent a secure Zoom link to access the interview room at the scheduled time. Interviews spanned no longer than one hour.

Before starting interviews with each participant, the interviewer ensured they were in a secure and private location and answered any of their questions. Participants were also reminded that they were not obligated to participate or answer every question in the interview. Thus, informed consent was obtained once again just before initiating the interview process. Participants could join the Zoom interview with their video on or off, with only the audio recording settings enabled.

Semi-Structured Interview

Once participants indicated their readiness to begin the interview, the student researcher used a semi-structured interview guide to proceed with the interview process (see Appendix Y). This guide used an inverted funnel approach to structure the questions from open-ended and less sensitive questions to more direct and sensitive questions (Braun & Clarke, 2013). This study used a phenomenological approach, meaning that the questions were structured in a manner that sought to understand the participants' experiences through their own voices (Starks & Trinidad, 2007).

Feminist principles were also used to inform data collection. The following six key principles were used throughout the interview, as adapted from Campbell et al. (2009), and were implemented by the interviewer reviewing these before and after each interview:

1. The emotional well-being of the participant was deemed most important
2. Participants were allowed to share their stories, no matter how long that may have taken
3. The interviewer continuously showcased patience and respect, as well as affirmed the participant's right to disclose or not to disclose
4. The interviewer was prepared to answer all questions and engage in dialogue
5. The interviewer engaged in a thorough debriefing process with each participant to normalize and provide an understanding of their experiences
6. The interviewer continuously held a demeanour and provided an environment that was warm, compassionate, and understanding

During the interview, participants were also provided with an outline of different behaviours that may constitute TFSV so that they could better speak to their experiences. Throughout each interview, Dr. Dwight Mazmanian, a registered Clinical Psychologist in the Province of Ontario, was accessible through phone call, email, and text message by the student researcher in case any participant were to experience severe emotional distress because of the interview process. However, no disclosures of significant distress were made throughout the interviews.

Post-Interview

At the end of each interview, the debriefing process occurred in line with principle five above. Due to the nature of the content of the interviews, the interviewer also engaged in

ongoing debriefing sessions with Dr. Mazmanian. Furthermore, self-care practices were prioritized by the student interviewer throughout the study (Coles et al., 2014). A reflexive journal was also used for the student researcher to reflect on their thoughts and feelings throughout the study.

Analyses

Cleaning the Transcripts

At the end of participant interviews, Zoom transcripts were saved and de-identified. However, after completing the first interview, it was discovered that a Zoom setting was not enabled to automatically save participant transcripts. When this discovery was made, which occurred directly after the first interview terminated, the interviewer attempted to record memorable key insights from the interview. Although this error was corrected for the rest of the interviews, this participant's data was ultimately lost, which resulted in the data from only nine participant interviews being analyzed in this study.

Saved transcripts from the nine participants were re-formatted from .txt files to .docx files for easier editing. Within each transcript, it was apparent that the Zoom recording software prematurely truncated text sections while a speaker was talking. Therefore, an initial step of the cleaning process involved condensing these portions of the transcript to make the content easier to follow. Simple and basic modifications to grammar and punctuation were also made (e.g., American to Canadian spelling). The text was altered in cases where it was clear that Zoom had mis-recorded a word (or words), and the original word (or words) were discernible. For example, in the context of an 2SLGBTQIA+-related conversation, a participant was mis-recorded as saying "operational" when they had said "homosexual."

In cases of ambiguity, a second person (i.e., another PhD graduate student) was consulted to assist with decoding the meaning of the text so that, through editing, the original spoken content had a higher likelihood of being retained. Of the nine transcripts that included participant voices (due to the recording error described earlier, the tenth transcript was not saved), five transcripts required consultation. Four, six, ten, twelve, and thirty-nine instances of text within these transcripts required consultation. For the transcript that contained 39 cases, this only constituted approximately 1.7% of the overall spoken word content. After consultation, only 30 to 50% of these instances remained ambiguous within each transcript. In these cases, the text was omitted, and brackets (containing the words "text omitted") were added to signal the location of the missing text so that during analysis these portions were not incorporated into the findings.

Analytic Approach

Thematic analysis, as outlined by Braun and Clarke in various articles and chapters (e.g., 2006, 2013, 2016), was used to analyze the participant interviews. A deductive and realist approach was used to derive common themes from the interview transcripts using NVivo (Lumivero, 2023). Here, a deductive approach refers to coding the data through a pre-existing coding frame based on the study research questions (Braun & Clarke, 2006). With a realist approach, participants' experiences were reported on rather than focusing on how these experiences were influenced by greater societal discourse (Braun & Clarke, 2006). Semantic themes were primarily generated that reflected the explicit meaning of the data rather than latent information (or inferred meanings).

The six steps delineated by Braun and Clarke (2006) were followed for analysis. These steps included familiarization with the data, generation of initial codes, searches for themes, review of themes, defining and naming themes, and production of the report. Rather than being a

linear process, it was accepted that throughout the analysis, movement could occur between steps in a nonlinear sequence (Braun & Clarke, 2006). In reporting the study findings, the Consolidated Criteria for Reporting Qualitative Research Checklist developed by Tong et al. (2007) and steps outlined by Nowell and colleagues (2017) for thematic analysis were consulted to enhance the trustworthiness of the data and findings. A second rater (i.e., the same PhD student engaged in the cleaning process) was also used to gauge the reliability of the study results further. In this process, the second rater was provided with one interview transcript (i.e., 11% of the raw interview data) and asked to highlight portions that identified risk avoidance strategies or the benefits and consequences of their use parallel to the study questions. The student researcher then compared the highlighted portions with the previously coded text in NVivo to determine whether anything was missed (Lumivero, 2023). The second rater did not identify any portions of text missed by the student researcher and, in turn, only missed identifying one risk avoidance strategy that the student researcher identified. This indicated a high degree of consistency between the two coders, leading to a high degree of certainty that the raw data was thoroughly coded where relevant to the study research questions.

When analyzing the data for this study, distinctions between what constituted a reactive versus preventive coping strategy were sometimes less clear. Although the research questions were focused solely on identifying preventive coping strategies (i.e., “risk avoidance strategies”), it was evident that strategies fell within a spectrum across reactive and preventive styles. For example, some women would report an experience of TFSV and recall a strategy they employed that both addressed the current experience (i.e., a reactive strategy) and also served to prevent future occurrences (i.e., a preventive strategy/risk avoidance strategy). Scenarios, where there appeared to be a primary or equal preventive role of a particular strategy, were coded during

analysis. However, scenarios where a strategy served more of a reactionary purpose, as deduced by contextual details, were left uncoded.

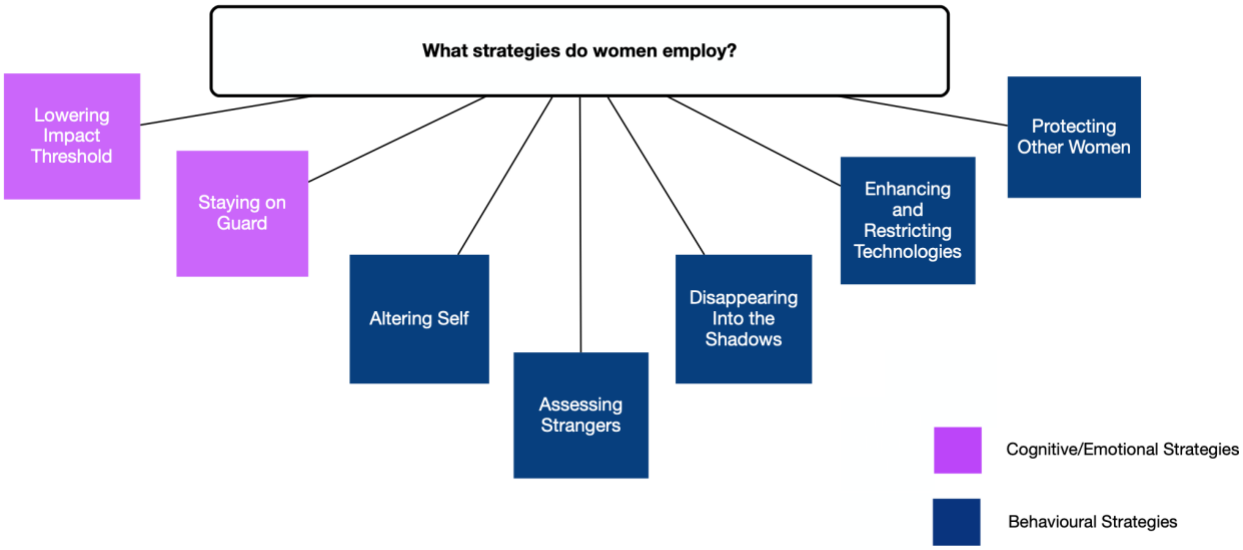
Findings

Risk Avoidance Strategies

For the first research question, "What risk avoidance strategies do women employ after experiencing TFSV?" seven resulting themes were identified from participant interviews (see Figure 29). Two of these fell within one overarching theme ("Cognitive and Emotional Risk Avoidance Strategies"), whereas the other five fell within a second overarching theme ("Behavioural Risk Avoidance Strategies").

Figure 29

Risk Avoidance Strategies Themes



Cognitive and Emotional Risk Avoidance Strategies

Two of the seven themes were conceptualized as primarily cognitive and emotional-type strategies. These differed from more explicit behavioural strategies wherein women recounted

"doing" something to enact a strategy. Instead, these cognitive/emotional strategies reflected women's internal orientations (i.e., thoughts and feelings) toward avoiding risk.

Theme #1: Staying on Guard. Women participants described maintaining a state of being on guard or hypervigilance when using technology to reduce or minimize the risk associated with TFSV. For example, participants spoke about being "*hyperaware of red flags*" or "*analyz[ing] things more*." They spoke about being "*always on edge*," "*more cautious*," and "*wary*." They also discussed approaching interactions with others, particularly men, with distrust (e.g., "… *[I am] distrustful towards, like, everybody*") and having heightened "*self-monitoring*" to protect against risk. This self-monitoring was viewed as a hypervigilance-like strategy in which they were monitoring their own behaviours to ensure that they did not do anything that could increase their risk. These strategies were all viewed within a cognitive and emotional spectrum related to an internal "on guard" state that women would continually maintain while using technology to avoid risk.

Theme #2: Lowering Impact Threshold. Women also described desensitization to TFSV as a strategy to protect against risk. For example, they described being "*numb*," "*so used to it*," and "*…dissociat[ing] from the situation and…[viewing] it from an objective sense*..." These were all viewed as internal strategies that reflected the lower impact thresholds maintained by women so that should TFSV occur, they would feel less of an emotional impact.

Behavioural Risk Avoidance Strategies

Behavioural risk avoidance strategies included women's approaches to avoid risk that involved actively employing a certain strategy through their behaviour. Two of these themes (i.e., "Disappearing into the Shadows" and "Enhancing and Restricting Technologies"), as outlined, were further divided into subthemes for enhanced interpretability and organization.

Theme #3: Altering Self. Women participants described altering or shifting their outward appearance or representations of self through technology to minimize the risk of TFSV. They did so in ways that changed their gender as perceived by others, such as with an avatar in gaming environments (e.g., "*…if I do know, like, I'm gonna be, like, in a toxic environment, I do change my gender. Especially in [Grand Theft Auto]*."). They also described attempts to blend in with dominant cultural norms (e.g., "*I try to like a-culture myself…*" and "*…I had to make sure that there [were] like two, three filters at least on it to make me look presentable as they say women's… women should…*"). These were all attempts to change or alter their outward appearance or representatives of their selves to reduce or eliminate risk.

Theme #4: Assessing Strangers. Participants also described behavioural strategies that they enacted to assess the risk posed by strangers. They described researching strangers through various methods, including, "*…I'll look them up on Instagram and see if I can find them. And if they're a friend of a friend, I add them*", "*…if we don't have any mutual friends like how many mutual friends do we have? And, like, do I even know those friends?*", or "*I'm gonna like…ask… like anyone that knows him. Okay, 'How is this dude?'*" Much of these appeared to be behaviours that stemmed from or were highly related to the "Staying on Guard" cognitive/emotional theme.

Theme #5: Disappearing into the Shadows. Throughout the interviews, women described a general sense of attempting to disappear, minimize their presence, or be on the periphery of other's awareness while using technology. They described this as "*I had already, like, kind of resolved myself to basically be, like, an anonymous person on the Internet as much as possible*" or "*You don't wanna give them anything to talk about or to look at*," for example. They also had more specific strategies for keeping outside the public conscience, including

concealing visuals, limiting their public display/personal disclosure/opinion, and limiting their social communication.

Subtheme: Conceal Visuals of Self. Women described strategies to conceal visual information about themselves, including not showing themselves in images or videos (e.g., "…*I just, like, never really posted anything like that, like, of myself*"), not showing their face or body, in particular (e.g., "…*I don't even put my face most of the time. It's just like things around it*" or "*There is literally no way that I would ever post my body*…"), not showing any femineity or gendered ideals (e.g., "*You try not to seem feminine. I don't know how to explain it, but, like, yeah. I've been very conscious about it… femininity… like I kind of hide it most of the time*"), and ensuring that they were not sharing any visual identifiers (e.g., "*tattoos*").

Subtheme: Limit Public Display, Personal Disclosure, or Opinions. Women participants also spoke about different strategies in which they limited their public displays, personal disclosures, and the sharing of opinions. For example, they attempted to limit the amount they posted (e.g., "…*I barely post*"), withheld personal details (e.g., "*I don't tell everybody what I'm doing every day, or, like, who I'm with and, like, who are my friends and everything. You know. Because that's just sensitive information that doesn't need to be out there*"), censored political views (e.g., "…*I used to post my political views on my Instagram story. Lots of men-inists would respond to them in really horrible ways. So eventually, I just learned, like, 'Hey, whatever. I'm just gonna… I'm gonna censor that part of me'*"), and refrained from engaging in any type of confrontation or negativity through technology (e.g., *"[I] try not to seem like hostile or anything…*").

Subtheme: Quiet Social Self. Women also engaged in strategies that restricted their social circle, including making changes to their circle (e.g., "*I changed who I talked to… who I,*

you know, interacted with on a day-to-day basis to keep myself away from that"), reducing the quantity of their network (e.g., *"...[I'm] not really adding anyone else at all*"), making private posts/stories/account/chats instead of public (e.g., "*I make sure everything is private*…"), only adding/following or allowing adding/following by known people (e.g., "*If there's someone I don't know, I shouldn't, like, follow them" or "I don't allow people I don't know to follow me*…"), only talking/playing/engaging with known people (e.g., "… *[I] learned, like, not to really talk to strangers*"), and only allowing access through invitation (e.g., "… *anytime I have a request of someone to add me, if it's not a request that, like, someone asked me directly and I gave it to them, I almost never accept*…"). Women also spoke about having low engagement with others (e.g., "…*I don't comment on things*"), selective engagement (e.g., "*I've considered I may be more selective in who I engage with*"), and prematurely ending engagement (e.g., "…*I've always been pretty quick on like the unmatch button, or just the no reply*…") in some cases. There was also reduced in-person engagement (e.g., "*I wouldn't talk to anyone*") stemming from attempts to reduce their risk of TFSV.

Theme #6: Enhancing and Restricting Technologies. Women spoke about ways in which they prevented risk through strategies related directly to the technologies. This included both behaviours that served as environmental controls for their experiences and securing their accounts and devices.

Subtheme: Control Platform Experiences. To minimize or eliminate the risk of TFSV, women described attempting to control their experiences on platforms. For example, they spoke about avoiding certain platforms (e.g., "…*I've deleted my own account too on certain applications or social media platforms*…"), using platform features to block unsolicited text/images/videos (e.g., "…*Instagram added a couple of things where, like, it will automatically*

not show any kind of photo if it gets sent to you…I've like turned that thing on…"), limiting the amount of their use (e.g., "*…I just limit myself on how much I use social media*"), and deleting and starting new accounts (e.g., "*…I just deleted that Instagram, and, like, started a fresh one cause there was too many people following me I didn't know*").

Subtheme: Secure Accounts and Devices. Women further protected their technologies by securing the location of their devices (e.g., "*…my laptop, even if it's in my apartment, I make sure it's in a safe place…*" and ensuring password protection and two-factor authentication features were enabled on their devices or accounts.

Theme #7: Protecting Other Women. There were also descriptions of how women consider and protect other women against TFSV. These strategies centred around attempts to warn other women (e.g., "*…someone made a TikTok about how this person does this to every girl in [location]…*") and shield them (e.g., "*…if I'm at… at my camp with my friends and I wanna make a post, I'll choose a picture from one we're at the campfire later instead of when we're all swimming. That's for myself. But some of it's also, like, you know, all the other girls are also there.*").

Benefits of Risk Avoidance Strategies

The second research question was: "What are the benefits for women who employ risk avoidance strategies?" and two themes were identified (see Figure 30).

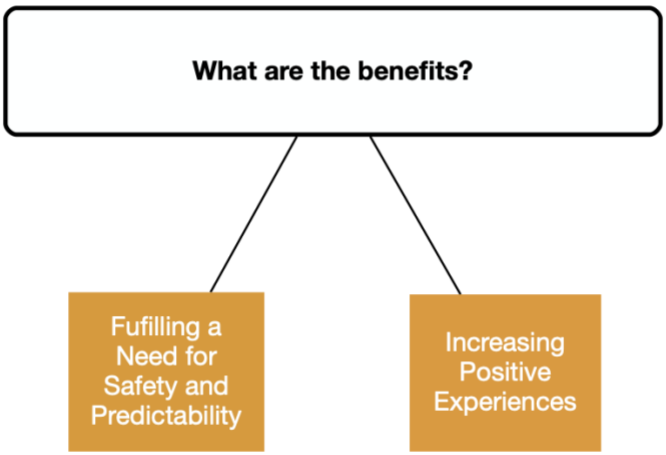
Theme #1: Fulfilling a Need for Safety and Predictability

Women participants described having an increased sense of safety (e.g., "*…I think I feel just safer…*") and perceived less exposure to TFSV (e.g., "*…it decreases the likelihood of this happening…*) after enacting risk avoidance strategies. They also spoke about the benefit of more predictability in their environment, including having more control (e.g., "*…I get to control what*

I see…") and less worry (e.g., "…*once I've taken all the necessary precautions, I just don't worry about it anymore, because I'm like… if something happens then at least I know that I've done everything I could*."). These were all viewed as satisfying a need for safety and predictability as they navigated technological environments.

Figure 30

Benefits of Employing Risk Avoidance Strategies Themes



Theme #2: Increasing Positive Experiences

Women also spoke about experiencing more happiness and fun (e.g., "… *I just feel more happy*" and "*It's more fun that way*") after enacting risk avoidance strategies. It also increased positivity by allowing them to save their mental resources (e.g., "…*I just really don't want to get into it anymore*"). These allowed women to have more positive experiences after enacting risk avoidance strategies.

Consequences of Risk Avoidance Strategies

The third and final research question was, "What are the consequences that women experience after employing these strategies?". Five themes were identified (see Figure 31).

Theme #1: Losing True Self or Autonomy

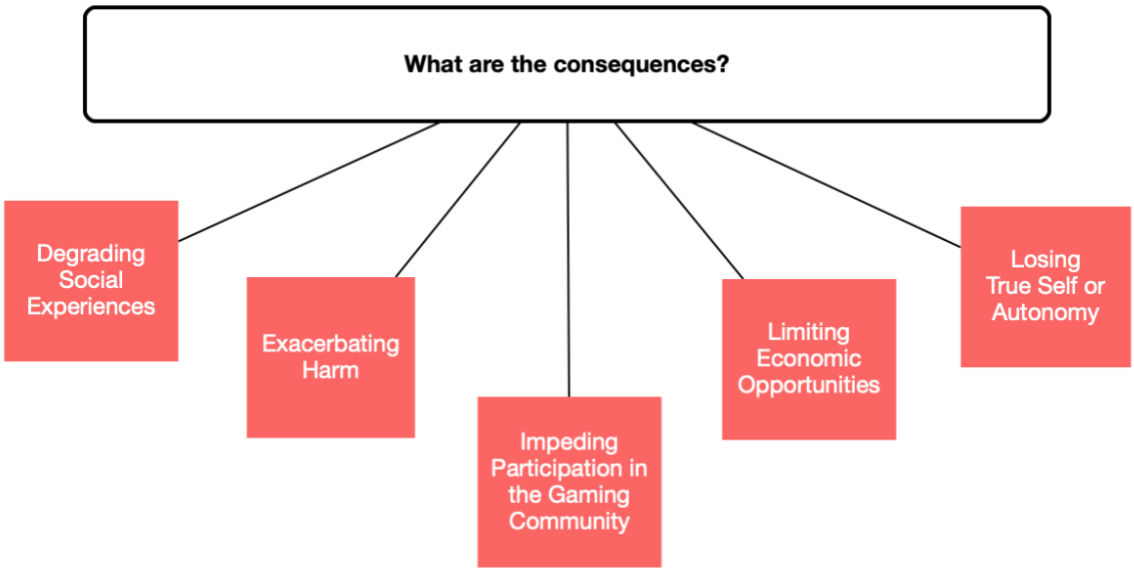
Women discussed some of the downsides of enacting risk avoidance strategies, which included having more of a hidden self (e.g., "…*well… [I'm] kind of hiding, I guess, you know a huge part of who I am and what I do*") and self-consciousness (e.g., "…*you become more self-conscious*"). They also voiced their concerns over how the strategies restrict their freedom (e.g., "…*it's repressive, if you will. Like, it's not… it doesn't allow… it doesn't… it's just unfortunate that women have to go to these kinds of extents to feel safe*"). These were interpreted as reflecting a loss of one's true self and autonomy due to using risk avoidance strategies.

Theme #2: Degrading Social Experiences

The women also discussed the effect of risk avoidance strategies on both technological and in-person interactions. They mentioned the loss of social connections after using strategies (e.g., "*I haven't made as much friends or, like, if I wanted to because I also have a barrier for… I just, like, kind of don't want to give out my information*"), including the limited opportunities to connect with communities online that could provide meaning (e.g., "… *some people have like positive experiences and, like, you know, have found their community… And I, yeah, I don't think I have done that. Like, I've not really found anything that I resonate with really. Maybe because I just limit myself on how much I use social media. You know. Like online is more safer, like, it's safer, for, like, you know, minorities to gather around like, you know, to find a sort sense of community*…").

Figure 31

Consequences of Employing Risk Avoidance Strategies Themes



They also spoke about misperceptions that were exacerbated by strategy use, including misperceptions by others (e.g., "*…people probably see me as, like, kinda like hidden or kinda like not that social or, like, kinda think I'm a bitch or something*") and themselves (e.g., "*it could just be like a misinterpretation on just one thing that someone said. And yeah… I can run with that*…"). Finally, they spoke about how in-person interactions can be made uncomfortable (e.g., "*It's just kind of awkward to have to block people, especially if it's people that you know or, like, you… you interact with. More than just a stranger on the Internet. 'Cause then it's like, 'okay if I happen to see you in real life, like, how am I supposed to deal with that interaction?*'"). These all degraded the social connections and experiences of the women.

Theme #3: Impeding Participation in Gaming Community

Several consequences of using risk avoidance strategies for gaming experiences were highlighted. This included worse gaming outcomes (e.g., "*…[if] I wouldn't give them like any*

attention, or like the light of day, it's, like, either, like, they just kill me, and like shoot me down or, like, throw me over what's inside…"). For one woman participant who would alter her avatar gender to male, she also highlighted the loss of identification with the avatar (e.g., "*…I like playing [female avatars] more, and then also I feel like the character. People always say 'she,' and I am a girl. I am female. That's like obviously correc*t"), and less opportunity for fun (e.g., "*…I just prefer the female characters, anyways, because I feel like it's more fun that way*").

Theme #4: Limiting Economic Opportunities

The impact risk avoidance strategies had on economic "influencer" opportunities, including those that restricted women's public presence, was also discussed. For example, one woman said, "*You miss out on certain things because your account is so private and closed off... Maybe you don't get as many likes, so your photos don't go viral or videos don't go viral*." This showcased how risk avoidance strategies may have limited women's economic or financial opportunities.

Theme #5: Exacerbating Harm

Women also spoke about the harm that they tried to avoid but could become exacerbated because of the enacted risk avoidance strategies. For example, they mentioned how strategies could inadvertently create more TFSV (e.g., "…s*ome dudes, like, will make it their mission to, like, try to get you…*") and cause negative emotions (e.g., "…*how it makes you feel to know like that you have to go this kind of far to stop this*...."). In effect, the women pointed to ways that risk avoidance strategies could inadvertently backfire and lead to more harm than they had initially intended to avoid.

Study Three Discussion

The final study in this dissertation aimed to investigate how women may cope in the aftermath of their TFSV experiences. Specifically, how they cope using risk avoidance strategies was examined, which are strategies that have been documented within the in-person sexual violence literature (Ullman et al., 2018). These risk avoidance strategies were conceptualized as falling within a category of preventive coping strategies, or strategies that are devised by victims to eliminate or minimize the risk from future TFSV experiences (Schwarzer & Luszczynska, 2008). Through qualitative interviews, women reported strategies that fell within seven broader themes and the benefits and consequences of using such strategies. These may allow for a better understanding of the secondary effects of TFSV, whether positive or negative, through women's employment of such coping strategies.

Women identified the use of both cognitive/emotional and behavioural risk avoidance strategies after their experiences of TFSV. This was a novel framework to view risk avoidance strategies, as most past research has conceptualized them as purely behavioural in nature (e.g., Pinciotti & Orcutt, 2018; Ullman, 2007; Ullman et al., 2018). In this study, women described internal changes (i.e., cognitive and emotional) as generally preceding or accompanying the behavioural. Therefore, this is the first project to provide a more robust understanding of how women may alter their cognitive and emotional states (e.g., through becoming hypervigilant or desensitized to the TFSV) to protect themselves against TFSV.

Some risk avoidance strategies, particularly victims' enhancement and restriction of technology (e.g., enabling protective features on social media), changing the way they present themselves, and no longer actively engaging, have been identified in other research on coping with technological violence in general (e.g., Champion et al., 2024; Veletsianos et al., 2018).

Furthermore, the continual assessment of threat and their protection of other women in the aftermath align well with risk avoidance strategies that have been identified in the in-person sexual violence literature (e.g., "whisper networks" that women use to convey information to protect each other from perpetrators of in-person sexual violence; Peters, 2020). Therefore, these findings represent a merger of two larger, and, often, separate bodies of the literature (i.e., cybercrime and women's studies). Although these findings provide an understanding of the types of strategies that may be employed, whether these strategies may be employed differently by subgroups of women (e.g., sexual minorities) is unclear. Furthermore, how these strategies relate to features of TFSV (e.g., severity, number of events) is also unknown. Thus, these questions are an area for future investigation.

As outlined previously, risk avoidance strategies have been viewed in the literature as both empowering and restricting to women's freedoms in society (Wannamaker, 2017). Indeed, participants voiced numerous benefits and consequences from using these strategies. Women reported that strategies allowed them to feel safe within predictable technological environments, indicating a feeling of power over their situations. Furthermore, it led to more positive technological experiences due to fewer TFSV experiences.

However, the voiced consequences echoed restrictions to their participation online, as has been observed after in-person sexual violence (Ullman, 2007). They indicated that enacting strategies could sometimes make the violence worse, which, again, has been echoed for in-person sexual violence, particularly within intimate partnerships (Thomas et al., 2015). Given the consequences that these strategies precipitate, it may be worth examining strategies that lead to more benefit than harm for women. Furthermore, the compounding negative effects of such strategy use on women's well-being and functioning require more attention in future research. To

better contextualize these findings within the complete results of this dissertation and the broader topic area, an integrated discussion now follows.

Final Series Discussion

Over the past five years, research on technology-facilitated sexual violence (TFSV) has been mounting. This dissertation sought to examine important considerations for women victims before, during, and after the violence, as drawn upon from topics in related, substantive bodies of literature (e.g., technological violence in general, sexual violence in person) not yet applied to TFSV. Through the integration of quantitative and quantitative methodologies, women's vulnerability, distress, and coping were directly investigated. These studies elucidated the vulnerabilities women may experience to TFSV (e.g., young age, sexual minority status, popularity online, problematic technology use), the complex relationships between TFSV and mental distress, and women's active (and yet potentially repressive) resistance to the violence through coping.

Complexity of Relationships Between TFSV and Vulnerability, Distress, and Coping

Although initially conceptualized to evaluate the pre-, during, and post-TFSV periods, each study proved non-discrete. In Study One, where vulnerability was a focus (i.e., "pre-TFSV"), a cross-sectional approach was used, which prevents any understanding of the causal sequence of the variables. While "vulnerability" factors (e.g., problematic technology use) were hypothesized to be antecedents to the violence, they may instead represent consequences. For example, TFSV may influence victims to engage in problematic technology use (e.g., concealing their use) rather than, as hypothesized, increase their vulnerability to it. Both possibilities may also coexist. Therefore, while conceptualized as distinct studies to examine vulnerabilities (pre-TFSV), distress (during TFSV), and coping (post-TFSV), these variable relationships are likely

more complex than the simple causal sequences hypothesized herein. This complexity was also observed in the results between TFSV and distress in Study Two, where trends suggested multi-directional relationships between these and associated constructs (e.g., affect).

Cognitive/emotional and behavioural risk avoidance strategies (i.e., preventive coping) in Study Three were also difficult to disentangle from reactive coping strategies (i.e., those that target past and present incidents versus future events; Schwarzer and Luszczynska, 2008), which lends support to the notion of multidirectional relationships. Study Three ultimately presented qualitative evidence of cognitive/emotional (e.g., desensitization) and behavioural (e.g., the altering of one's self) strategies that could be experienced *before*, *during* and *after* the violence. Some preventive coping strategies may also inadvertently increase one's vulnerability. For instance, the degree to which women experience hyperarousal (i.e., "staying on guard") might be important to investigate, as in cases of in-person sexual violence, hyperarousal has been shown to serve as a vulnerability factor through skewing evaluations of risk (e.g., Jaffe et al., 2019). Given these parallels between in-person sexual violence and TFSV, future prospective research on TFSV may benefit from further disentangling these complex relationships by drawing on findings from the in-person literature.

Conceptualization and Measurement Considerations for TFSV

In this series of studies, the umbrella term of TFSV was used, as informed by past research by Henry and Powell (2018). This framework was useful for delineating behaviours that may constitute TFSV and also permitted the use of a well-validated tool created by these authors (i.e., the TFSV Victimization [TFSV-V] Scale). However, as expected, since the selection of this framework in 2021, the literature has evolved, with new studies refining the conceptualization and measurement of TFSV (e.g., Koukopoulos et al., 2025). More research on conceptualization

and measurement is also anticipated (e.g., Pak et al., 2024). These developments highlight the challenges of defining and measuring TFSV, even among experts (Koukopoulos et al., 2025).

Definitional complexity is compounded by the involvement of different sectors — including governments, non-profit organizations, and academic institutions — and a range of disciplines, such as criminology, psychology, media studies, and computer/information science (Koukopoulos et al., 2025). Given the academic and psychological orientation of this dissertation, it is important to consider how sector and disciplinary biases may have influenced the development and measurement of TFSV. For example, psychology subject experts showed less agreement with other disciplines when viewing behaviours such as romance scams/frauds, online trolling, and online child sexual abuse as falling under the TFSV umbrella (Koukopoulos et al., 2025). This applies to the TFSV framework used across this series of studies, which excluded these sorts of behaviours. The TFSV Victimization (TFSV-V) Scale also appears to be the most popular tool used by experts to capture victimization by all types of perpetrators (i.e., not exclusive to intimate relationships, see Kim and Ferraresso [2023] for a review of these specific tools; Powell & Henry, 2019). Given psychology's measurement/psychometric orientation, the popularity of this tool may be due to the heavy presence of psychological researchers in the area. Therefore, recognizing and addressing the challenges of definitional transferability may help to promote interdisciplinary coherence and ultimately, assist with more practical applications of TFSV research.

In future measurement of TFSV, lessons may also be derived from the in-person sexual violence literature. Sorochinski and Varvaro (2023) offer a specific model in which to consider TFSV. Based on the Interpersonal Model (Canter, 2000), they outline that it might be helpful to conceptualize TFSV behaviours by offender-victim relationships. Behaviours, then, can be

categorized based on the perpetrator's views of the victim: 1) as a person (e.g., offender has a personal relationship with the victim where harm is intended), 2) as a vehicle (e.g., the victim serves a greater purpose for the offender, like sexual gratification), or 3) as an object (e.g., enacting violence is the intent with no consideration for the victim). They argue that this framework will assist pre-existing legal structures to view TFSV in line with other known sexual offences. Therefore, this may be a helpful framework for defining TFSV in a way that enhances cross-disciplinary understanding. It may also assist in re-configuring the harms that victims experience by drawing on this body of research, should certain types of offender-victim relationships enhance consequences for victims. It can also help to center the experiences of women, as TFSV victims, and critically, of the roles of perpetrators in enacting this violence.

From using the TFSV-V Scale, the types of TFSV behaviours reported across studies one and two in this project broadly echoed trends in the literature that indicate that TFSH and gender and sexuality-based abuse may be the most common among TFSV behaviours (Cripps & Stermac, 2018). However, a surprising finding was related to a TFSV scale item ("partner checking up on location") that was heavily endorsed (i.e., 40% in Study One, 59% pre-EMA in Study Two). Although the TFSV scale creators added this item to reflect cyberstalking in intimate partnerships, it is possible that item phrasing caused participants in these studies to not be aware of the *nonconsensual* nature of this behaviour, which underpins all TFSV behaviours. Therefore, in the future use of this scale by psychology academics or otherwise, it might be helpful for this item to be modified or eliminated to enhance the internal consistency and construct validity of the TFSV-V Scale. This observation highlights the importance of explicitly incorporating the element of consent into item wording when measuring TFSV-related behaviours in future research.

Some infrequent TFSV experiences were also echoed in this series, including specific image-based exploitation experiences (e.g., an image/video was posted of an unwanted sexual experience). However, other image-based exploitation experiences were more prevalent (e.g., being pressured into sending nudes). Notably, this latter item was an addition to the TFSV-V Scale introduced in this dissertation. Additionally, despite a paucity of past research on unwanted sexual experiences in-person facilitated through technology, it was reported by 6% to 21% of participants across samples in this series. These rates broadly align with estimates produced by other Canadian researchers (e.g., 8% in a study by Cripps and Stermac, 2018). These findings carry implications for the measurement of TFSV in future research, through considerations of behaviours that may be more prevalent than initially thought.

Intersectionality as an Important Consideration

In this dissertation, the project's inclusivity was purposefully advertised to women participants to increase the diversity of the samples and signal that White cis-gender heterosexual women were not a sole focus. This appeared to enhance the diversity of our sample, as nearly 30% of the sample in Study One identified as a sexual minority, which only increased across studies two and three. This number can be compared to an estimated 11% of post-secondary students in Canada identifying as a part of the 2SLGBTQIA+ community (Burczycka, 2020). It suggests that women of sexually diverse backgrounds may have more vested interest in participating in this research than heterosexual women. This aligns with the results of Study One that indicate that sexual minority status may serve as a vulnerability factor for TFSV, and other research that has found that TFSV is more prevalent among sexual minorities (Champion et al., 2024; Henry & Powell, 2018; Powell et al., 2018). It also highlights the benefit of integrating an intersection lens into TFSV research to ensure that minorities, who may be most vulnerable to

the violence, are adequately represented. While efforts in this project improved representativeness, future research could operationalize intersectionality more directly by, for example, exploring within-group differences among minority women, investigating how intersecting identities influence mental distress and coping, and developing measures that capture culturally and contextually specific forms of TFSV.

Implications of Series

The broader implications of the TFSV body of literature relate to prevention and intervention initiatives across sectors (e.g., legal/government, technology companies, and post-secondary institutions). Furthermore, the findings across the three studies, including the high prevalence of TFSV (Studies One and Two) and women's implementation of risk avoidance behaviours (Study Three) highlight the need for systemic, multi-level responses rather than relying on individual victims to manage their victimization alone.

Legislation. Although a comprehensive legal review is beyond the scope of the current project, navigating existing legislation can be cumbersome for victims. Navigation is particularly difficult due to the incomplete coverage of TFSV behaviours by existing laws and differences from nation to nation (despite TFSV occurring across borders; Witt et al., 2024). Given the perpetual and rapid evolution of technologies and thereby, TFSV, alongside slower legal systems, legislative concepts covering a broad range of behaviours have been highlighted as best to protect future victims (Sorochinski & Borukhov, 2024). For example, McGlynn (2024) provides the concept of "intimate intrusions" as a broad legal term to capture not-yet-observed behaviours that is distinct enough to include all TFSV behaviours. This aligns with the previously discussed complexities in the measurement of TFSV and its translation across sectors.

Therefore, TFSV research may benefit from further cross-discipline collaborations to ensure that research terms are fully translatable to the systems meant to protect victims.

Public Education. The prevalence rates of TFSV victimization experiences across studies one and two (i.e., 75% and 87%) coincide with past research that has estimated prevalence rates up to 84% in Canadian populations, which is notably higher than other countries (e.g., United States, Australia; Benítez-Hidalgo et al., 2024). Benítez-Hidalgo and colleagues (2024) posited that this difference may be due to more public awareness of TFSV in Canada, which may assist victims in labelling and reporting their experiences. Although awareness may explain the higher prevalence rates, the degree to which this may also reflect societal normalization or acceptance of TFSV within Canada could also be investigated. This raises the more insidious possibility that TFSV may be more publicly accepted in certain nations or cultures, which could warrant educational campaigns directed toward both labelling these experiences and reshaping broader societal attitudes. While this series of studies provides estimates on prevalence rates, particularly in undergraduate women samples, Sheikh and Rogers (2024) highlight how the removal of women from online spaces may also contribute to underestimates of the true TFSV phenomenon, suggesting that prevalence rates may be even higher than what was reported here.

Technology Companies. In a survey of over 1500 Australian adults, heterosexual men were more likely to have positive experiences reporting TFSV to technological platforms than women, and particularly, even more than sexual minority women (Lawler & Boxall, 2024). This begs the question of how technology companies can better intervene for women victims. However, Phippen and Bond (2024) caution legislators, researchers, and other professionals in the area to be wary of tactics meant to prevent TFSV but disregard the social context that enables

these behaviours, much like the "war on drugs." They argue that placing the blame on technology companies, or otherwise, is not victim-centric because it does not address the social problems from which these behaviours arise. Nonetheless, a balanced strategy—combining support for victims with broader systemic reform—may best address this phenomenon.

Post-Secondary Institutions. An environmental scan by Oswald and colleagues (2023) showcased the lack of integration of TFSV educational resources by post-secondary institutions in British Columbia, Canada. They recommend that institutions prioritize funding for such resources, create living documents, and integrate diverse perspectives into resource development. Furthermore, a review of gender-based violence prevention training across Canadian academic institutions and community organizations more broadly revealed that only 15% included content on TFSV (Chen et al., 2024). This suggests that there is likely more that can be done by post-secondary institutions to educate students and provide policies and resources for student victims.

Limitations of Series

The three studies in this dissertation focused exclusively on women sampled from a Canadian post-secondary institution. The overuse of undergraduate students has been highlighted as a major concern for TFSV research (Henry & Powell, 2018). Although this provides an understanding of TFSV within a group that may be more vulnerable (i.e., young women), it prevents any understanding as to how other groups of women experience TFSV. Furthermore, while minority groups were a topic of focus in the current research, women with less education are not represented within the study samples. Given that there is a significant advantage to achieving higher education, including perhaps more awareness of constructs like TFSV, the results may not be generalizable to women with less education. This is also true of women of older ages and less White-dominant student populations. Moreover, this series provides no

information about the experiences of men victims of TFSV, where it may also be important to consider sexual minority status (e.g., Zhang, 2025). Canada has also been a primary location of TFSV research (e.g., Patel & Roesch, 2020), and these results may not apply to TFSV victims from other nations. These represent significant limitations in the transferability of these results to dissimilar populations.

These studies also relied exclusively on self-report data that, while convenient, has inherent flaws. Self-report measures are valuable for capturing personal experiences and perceptions but are limited by potential biases that can affect the accuracy of the data. In Study One, participants were asked to self-report on various technological constructs, including parental monitoring which may have been more difficult to recall, as it involved reporting on others' behaviour (i.e., their parents). In the EMA portion of Study Two, some of the disadvantages of self-report (e.g., retrospective recollection) was sought to be minimized through the immediate collection of TFSV reports. However, it is unknown the extent to which women immediately responded after their TFSV experiences. For example, the hour interval in which they had to respond may have led some to mis-recollect their experience and their resulting affect, as has been highlighted in the literature of limitations of experience sample methods (e.g., Verbeij et al., 2022). Blurring lines with in-person situations also makes it possible that some of what was captured in the studies represents non-technological spaces. In Study Three, some women spoke about their employment of risk avoidance strategies as a general practice based on factors other than TFSV (e.g., parent education, non-sexual violence-related risks through technology). As a result, women's self-report on their TFSV experiences may have been non-specific to TFSV experiences at times.

Furthermore, much of TFSV research has been cross-sectional (and correlational) in nature, which was also the approach taken in Study One. However, Study Two sought to address this limitation using an EMA design. Yet, attrition was a concern with the repeated measures used within this design, and participants who dropped out of the EMA in Study Two may represent a certain subgroup of interest. Time-of-year effects are also necessary to consider in this research. For instance, distress or TFSV may worsen at certain times during the academic year, such as when sampling students during exam time, and this may affect results (e.g., distorting baseline distress scores). Although repeated measures designs allow for the examination of changes over time and reduces between-subject variability, there are several drawbacks to its use in Study Two, including participant fatigue and the influence of prior reporting on later reporting. As discussed earlier, the use of technology across the methodologies of these studies is also not without recognition of the harm that technological mediums have caused the women participants who were victims of TFSV. Using the Zoom platform to conduct interviews in Study Three rather than face-to-face may also have led some participants to feel less comfortable disclosing their TFSV experiences. Future TFSV research may seek to reduce the reliance on technological methodologies for this reason.

Future Directions for TFSV Research

Directions for future research have been integrated throughout this discussion. However, it is worth noting that, in this project, by no means were all aspects of vulnerability, distress, or coping examined for women TFSV victims. There remain areas ripe for further investigation, including other technological factors that may affect vulnerability (both negatively and positively), other psychological constructs associated with distress (e.g., substance use), and other forms of preventive coping. Future projects in the area might also test the studies' results or

expand understanding of these considerations. Given the degree to which the consequences of TFSV need support to gain greater systemic attention, the most pressing area of expansion is likely to causal investigations of the relationship between TFSV and psychological harm. This may be expanded to include the secondary effects of risk avoidance strategies on well-being. Further, the extent to which risk avoidance strategies perpetuate (or not) resulting distress from TFSV may be a worthwhile topic for future research.

One additional area not previously discussed is the potential economic effects of TFSV. In Study One, with online popularity presenting as a vulnerability factor for TFSV, it raises the question of whether as TFSV increases, women are limited in reaching their technological economic potential. This is especially concerning given "the chilling effect" that has been observed across TFSV research, which describes the widening of a technological gender gap as women remove themselves from these spaces (Benítez-Hidalgo et al., 2024). This further impairs their ability to earn an income based on technological platforms. In a United States national survey conducted by Sheridan-Johnson et al. (2024), victims of technological abuse (not specific to sexual) incurred costs associated with seeking mental health services, legal assistance, technology (e.g., changing phones), amongst others. The extent to which this applies to TFSV is unclear and could be a topic of further study. A cost analysis that integrates both loss of income potential and health care, time, and other costs incurred could be beneficial. Consideration may also be paid for loss of income through sex-related technological services offered by women (e.g., Qin et al., 2024), as well as any loss of income due to workplace-specific TFSV (Flynn et al., 2024).

Conclusion

This dissertation has shed light on the experiences of women who are victims of technology-facilitated sexual violence (TFSV), addressing critical gaps in our understanding of vulnerability, psychological distress, and coping strategies. It elucidated how demographic factors and patterns of technology use may contribute to women's vulnerability, connections between TFSV and mental distress, and the dual nature of coping strategies as both empowering and repressive. These findings underscore the challenges women can face when navigating today's technological world. Although this research focused on women victims, the responsibility for eradicating this form of gender-based violence lies with society as a whole; the onus does not fall on the women.

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Appendix A

Information Letter – Study 1

Dear Potential Participant:

Thank you for your interest in the "Experiences with Technology" study. You have been invited to participate in this study so that we can better understand people's experiences on technological platforms.

Taking part in this study is voluntary. Before you decide whether you would like to take part in this study, please read this information carefully to understand what is involved. If you have any questions, please ask one of the research team members (see the contact information at the end of this letter).

PURPOSE

The main purpose of this study is to assess participants' use of technology and experiences on these technological platforms. Specifically, we are interested in the privacy and security of users on these platforms.

WHAT INFORMATION WILL BE COLLECTED?

In the present study participants will be asked some general questions, such as information about their demographics. They will also be asked questions about their use of and experiences with technology, including matters related to security.

WHAT IS REQUESTED OF ME AS A PARTICIPANT?

The present study is a survey study that will be hosted on the SurveyMonkey platform (i.e., an online survey developer). The study may be completed at a time and location of your choosing. It is anticipated that it will last no longer than 30 minutes.

WHAT ARE MY RIGHTS AS A PARTICIPANT?

You are under no obligation to participate and are free to withdraw at any time without prejudice to pre-existing entitlements. Your decision to participate will also not affect your academic status. You may also refuse to answer any question or questions while partaking in this study.

WHAT ARE THE RISKS AND BENEFITS?

There are no known physical risks associated with participating in the current study. However, some of the material in the questionnaires contains sensitive subject matter that might result in minor psychological discomfort for some people. If this occurs and you would like some extra support, you may contact Student Health and Wellness at Lakehead University. If you are at Thunder Bay campus, you may contact 1-807-343-8361, and if you are at Orillia campus, you may contact 1-705-330-4008 ext. 2116. For the Thunder Bay Crisis Response Service through the Canadian Mental Health Association, you may also contact 1-807-346-8282 or for the Ontario Mental Health Helpline, please contact 1-866-531-2600.

As a token of our gratitude for participating in this research, you may elect to receive a half bonus credit towards an eligible Lakehead University psychology course. If you elect to receive bonus marks, you must access this survey through the Sona system (http://lupsych.sona-systems.com).

HOW WILL MY CONFIDENTIALITY BE MAINTAINED?

Your anonymity and confidentiality will be maintained throughout this study and the faculty research investigator (Dr. Dwight Mazmanian) will not know which students have participated in this study. No identifying information will be associated with responses or research results. Only Dr. Mazmanian (principal investigator), Casey Oliver (student investigator), Erika Puiras (student research team member), and Mica Shenin (student research team member) will have access to the anonymized data.

Please note, however, that the online survey tool used in the study (SurveyMonkey.com) is hosted by a server located in the USA. The US Patriot Act permits US law enforcement officials, for the purpose of anti-terrorism investigation, to seek a court order that allows access to the personal records of any person without the person's knowledge. In view of this we cannot absolutely guarantee the full confidentiality and anonymity of your data.

WHAT WILL MY DATA BE USED FOR?

The data obtained in this research will be used for the doctoral dissertation of the student investigator, Casey Oliver, and the findings will also be used for research publications and/or presentations at scholarly conferences. Your identity will remain anonymous throughout these processes.

WHERE WILL MY DATA BE STORED?

All raw data will be securely stored at Lakehead University for five years.

HOW CAN I RECEIVE A COPY OF THE RESEARCH RESULTS?

A summary of the results can be made available to you by email once the study has been completed. If you are interested in receiving these research results, please email the researcher at [coliver3@lakeheadu.ca] with the subject heading "Results Summary Request – Experiences with Technology Study". We will email you a copy of the Results Summary once it is made available which may take up to three years after you complete the study.

WHAT IF I WANT TO WITHDRAW FROM THE STUDY?

Your participation in this research is completely voluntary, and should you choose not to participate, you may do so without consequence or the need for justification. Similarly, you may also discontinue your participation at any time without explanation or penalty. However, once you submit your data it cannot be withdrawn due to its anonymity. If you wish to withdraw from the study, please contact the student investigator at coliver3@lakeheadu.ca.

RESEARCH TEAM CONTACT INFORMATION:

If you have any further questions regarding this study, you may contact:

Casey Oliver, MA, Clinical Psychology Graduate Student: coliver3@lakeheadu.ca

Dwight Mazmanian, PhD, Professor, Department of Psychology: dmazmani@lakeheadu.ca

RESEARCH ETHICS BOARD REVIEW AND APPROVAL:

This research study has been reviewed and approved by the Lakehead University Research Ethics Board. If you have any questions related to the ethics of the research and would like to speak to someone outside of the research team, please contact Sue Wright at the Research Ethics Board at 807-343-8283 or research@lakeheadu.ca.

Thank you for your interest and participation. It is greatly appreciated!

Appendix B

Consent Form

MY CONSENT:

I agree to the following:

- ✓ I have read and understand the information contained in the Information Letter
- ✓ I agree to participate
- ✓ I understand the risks and benefits to the study
- ✓ That I am a volunteer and can withdraw from the study up until the data is submitted, and may choose not to answer any question
- ✓ That the data will be securely stored at Lakehead University for 5 years following completion of the research project
- ✓ I understand that the research findings will be made available to me once the study is completed, if I have requested it through email
- ✓ I will remain anonymous
- ✓ All my questions have been answered
- ✓ Due to collection and/or storage of data via an online tool, we cannot absolutely guarantee the full confidentiality and anonymity of your data. With your consent to participate, you acknowledge this.

By consenting to participate, I have not waived any rights to legal recourse in the event of research-related harm.

I have read and agree to the above information and, by completing and submitting this survey, agree to participate.

If you consent to participate in the study, please click the "Next" button at the bottom of the page to continue.

Appendix C

Thank You and Debriefing Form – Study 1

Thank you for your participation in this research project on technology. We hope that this study will provide information on young adults' use of technology and their experiences with others on technological platforms. Past research has indicated that some factors (e.g., the perceived risk of using technology), may make individuals more vulnerable to some experiences, like unwanted sexual attention. Hence, the researchers in this project hope to expand information on these types of experiences by examining technological risk factors of interest. This information can then be used to inform prevention and treatment strategies for perpetrators and victims of negative technological encounters.

Information about Study Results
A summary of the results can be made available to you by email once the study has been completed. If you are interested in receiving these research results, please email the researcher at [coliver3@lakeheadu.ca] with the subject heading "Results Summary Request - Experiences with Technology". We will email you a copy of the Results Summary once it is made available which may take up three years after you complete the survey.

Bonus Credit
As a token of our gratitude for participating in this research, you may elect to receive one half of a bonus credit on Sona to be used towards an eligible Lakehead University psychology course. If you elect to receive this credit, you must have signed up for this survey through the Sona system and your course instructor must allow for bonus marks. Once the survey has been completed, you will be granted the credits.

If you have specific questions about the survey you may contact the student investigator, Casey Oliver, M.A. [coliver3@lakeheadu.ca] or the principal investigator, Dwight Mazmanian, Ph.D., C.Psych [dmazmani@lakeheadu.ca, 807-343-8257].

If completing this survey has raised any mental health concerns that you would like to discuss, you may contact Student Health and Wellness at Lakehead University. If you are at Thunder Bay campus, please contact 1-807-343-8361, and if you are at Orillia campus, please contact 1-705-330-4008 ext. 2116. For the Thunder Bay Crisis Response Service, you may also contact 1-807-346-8282 or for the Ontario Mental Health Helpline please contact 1-866-531-2600.

Please print or save a copy of this letter for your records.

With sincere thanks,
Casey Oliver and Dr. Dwight Mazmanian
Health, Hormones, & Behaviour Lab, Department of Psychology

Appendix D

Technology Questionnaire

For the next questions please respond based on what is normal for you.

1. What technological platforms/functions do you regularly use? (*rank them from most used to least used – do not rank ones that you do not use*)
    a. Social Media/News (e.g., Instagram, Snapchat, Facebook, Twitter, TikTok, Pinterest, YouTube)

    b. Dating Applications (e.g., Bumble, eHarmony, Grindr, Hinge, Plenty of Fish, Tinder)

    c. Video Game Platforms (e.g., Xbox, PlayStation, Nintendo Switch, Personal computer games, Phone application games, social media games)

    d. Chat Applications (e.g., WeChat, WhatsApp, iMessage)

    e. Video Conferencing Applications (e.g., Facetime, Zoom, Skype)

    f. Internet forums (e.g., Reddit)

    g. Blog websites

    h. Email

    i. Phone calling

    j. SMS text messaging

    k. Other

2. If you selected any video game platforms in question 1c, what type of games do you typically play? (select all that apply)
    a. Action-Adventure (i.e., a broad category of games oriented toward action and exploration, mostly in third person perspective)
    b. Massively multiplayer online role-playing games (MMORPG) and other role-playing games (RPG) (i.e., massively multiplayer online role-playing games in which players develop a character and interact collaboratively and competitively with other players in a shared online world)
    c. First/third-person/other shooter (i.e., kill-or-be-killed in fast, violent action, usually with military or sci-fi themes)
    d. Gambling (i.e., primarily simulations of poker, black jack, and slot machine gambling)

e. Real-Time and other strategy (i.e., strategic combat oriented games from an aerial perspective with no wait between moves or turn-based, and other forms of strategic simulation)
f. Board/card games (i.e., simulations of primarily classic games without gambling)
g. Sports (i.e., realistic simulations, primarily of team sports)
h. Puzzle (i.e., games involving matching, logic, deductive reasoning, and other puzzles)
i. Rhythm (i.e., music and dance themed games often involving a unique controller like a guitar or dance pad)
j. Driving (i.e., primarily car racing games)
k. Platformer (i.e., games in two or three dimension in which players contend with enemies in an environment requiring precise movement and jumping to achieve objectives)
l. Other

3. How many hours per day, on average, would you estimate that you use the technological platforms/functions that you selected in total? (best estimate)
a. Numerical response

4. Why do you use each of the platforms/functions that you selected above? (select all that apply)
For:
a. Fun
b. Creativity
c. Job
d. Gambling
e. School
f. Volunteering
g. Information and news
h. Socialization
i. Romantic connections
j. Sexual connections
k. To escape from and cope with reality
l. To escape to a fantasy or imaginary experience
m. Other

5. Who do you typically connect with on the platforms/functions that you selected above? (select all that apply)
a. Friends (including online friends that you have not have met in-person)
b. Family
c. Acquaintances (i.e., someone who you know but not on a personal level, not including school mates or work associates)
d. Person I have been intimate with in conversation and/or physically, but would not consider a past or current partner (e.g., “friend with benefits”, “hookup buddy”, person who has been on dates with you)
e. Intimate partner(s)

    i. Past
    ii. Current
f. School mates (e.g., classmates, lab mates)
g. Work associates (i.e., colleagues, supervisors, managers)
h. Strangers
i. Other

6. Do you have regular access to a smart phone?

Appendix E

Technology-Facilitated Sexual Violence Victimization (TFSV-V) Scale

In the past 6 months, how often have you experienced the following through technology (from *daily, weekly, monthly, less than monthly,* to *never*):

1. Someone sexually harassed you
2. Being sent unwanted sexually explicit images, comments, emails, or text messages
3. Partner has checked up on your location/activities multiple times a day
4. Unwanted sexual requests online or via email or text message
5. Partner gained access to your emails or other online accounts without permission
6. Someone publicly posted online an offensive sexual comment about you
7. Someone posted personal details online saying you are available to have sex
8. You were pressured into sending nude images/videos
9. Nude or semi-nude image were taken without permission
10. Nude or semi-nude image were posted online/sent onto others without permission
11. Nude or semi-nude image threat to post online/send onto others
12. Image/video of an unwanted sexual experience was taken
13. Image/video of an unwanted sexual experience was posted online/sent onto others
14. Image/video of an unwanted sexual experience threat to post online/send onto others
15. Unwanted sexual experience in-person with someone met online
16. Unwanted sexual experience in-person with someone met dating site/app
17. Gender-based offensive and/or degrading messages, comments, or other content
18. Sexuality or sexual identity based offensive and/or degrading messages, comments, or other content
19. Sexually violent threats
20. Someone described or visually represented unwanted sexual act against your avatar or game character
21. Someone described or visually represented unwanted sexual act against you using an online/ email/messages
22. Any of the above occurred repeatedly (i.e., by the same perpetrator[s])

Appendix F

Demographic Questionnaire

1. What is your age?
    a. Open response (numerical)

2. What is your gender identity? Check all that apply.
    a. Woman
    b. Gender fluid
    c. Man
    d. Nonbinary/Genderqueer/Gender nonconforming
    e. Questioning
    f. Transgender
    g. Two-Spirit
    h. I identify as (text box)
    i. Prefer not to answer

3. What is your sexual orientation? Check all that apply.
    a. Asexual
    b. Bisexual
    c. Gay
    d. Heterosexual (“straight”)
    e. Lesbian
    f. Pansexual
    g. Queer
    h. Questioning
    i. Two-Spirit
    j. I identify as (text box)
    k. Prefer not to answer

4. How do you describe your racial, ethnic and/or cultural background? Please check all
    a. that apply. African
    b. Black
    c. Caribbean
    d. East/Southeast Asian
    e. Hispanic/Latinx/Latina/Latino
    f. Indigenous (First Nations, Metis, or Inuit)
    g. Middle Eastern
    h. Pacific Islander
    i. South Asian
    j. White (Caucasian)
    k. Mixed
    l. I use other terms to describe my racial, ethnic and/or cultural background: (text box)
    m. Prefer not to answer

5. Do you identify as a cultural, ethnic, and/or racial minority?
    a. Yes
    b. No
    c. Prefer not to answer

6. What is the highest level of education you have completed?
    a. None
    b. Elementary school
    c. Some high school
    d. High school completed
    e. Some college or technical school
    f. College or technical school completed
    g. Some undergraduate training
    h. Undergraduate degree completed
    i. Some graduate training (e.g., Masters, Doctoral)
    j. Master's degree completed
    k. Doctoral or professional degree completed
    l. Other (text box)

7. What is your current cumulative grade point average (0-100)? If this is your first semester at Lakehead, please use/estimate your exiting grade point average from the last educational institution you attended (e.g., high school, college).
    a. Numerical response

8. What is your work/employment status?
    a. Employed full-time
    b. Employed part-time
    c. Unemployed

9. Are you currently a student at a university or college?
    a. Yes – full time
    b. Yes – part time
    c. No

10. If yes, are you a domestic or international student?
    a. Domestic (Canadian/permanent resident)
    b. International

11. We would like to understand your socio-economic. In your family of origin (your household growing up) please make your best guess of your total annual family income, before taxes.
    a. Under $10,000
    b. $10,001 - $24, 999
    c. $25,000 - $49,999
    d. $50,000 - $74,999
    e. $75,000 - $99,999

f. $100,000 - $124,999
g. $125,000 - $149,999
h. $150,000 - $174,999
i. $175,000 - $199,999
j. $200,000 - $249,999
k. $250,000 - $299,999
l. $300,000 or more
m. Don’t know
n. Prefer not to say

12. What is your marital status?
    a. Single
    b. Married/common-law
    c. Separated/divorced
    d. Widowed
    e. In a committed relationship (not married or common law)
    f. Prefer not to say

13. Do you identify as having a disability?
    a. Yes
    b. No
    c. Prefer not to answer

Appendix G

Risk Perception and the Optimistic Bias

Consider the risk of harm as a consequence of the following activity/technology/aspect. For example, the use of electricity carries the risk of electrocution. It also entails risk for miners who produce the coal that generates the electricity. For another example, motor vehicles entail risk for drivers, passengers, bicyclists, and pedestrians. To what extent does the following activity/technology/aspect pose a risk to you? (Used a 7 pt Likert scale from 'poses no risk' to 'poses great risk'

1. Failing to do 'secure browsing', in other words not browsing the internet on a secure connection (https) when possible
2. Failing to receive 'login notifications' that warn you when it looks like someone else is trying to access one of your accounts
3. Failing to use malware or anti-virus software on your devices
4. Providing personal information over the phone to strangers
5. Keeping your location on your device(s) so that others know your whereabouts
6. Clicking unknown website links that have been sent to you
7. Allowing all your content (e.g., 'posts', 'stories', videos) to be shared with others
8. Allowing your e-mail address to be shared with others
9. Allowing your phone number to be shared with others
10. Allowing others to post or tag you in any content they share
11. Failing to review tags or posts of you that have been made by other people
12. Failing to keep a restricted list of 'friends' who can only see the information that you make public
13. Failing to block users so they can no longer see things you post, tag you, invite you to events or groups, start a conversation with you or add you as a 'friend'
14. Sharing your audio and video in Zoom meetings with strangers
15. Allowing apps to track your activity when asked
16. Looking at erotic or pornographic pages

Now, to what extent does the following activity/technology/aspect pose a risk to other people who are a similar age as you? (Used a 7 pt Likert scale from 'poses no risk' to 'poses great risk'

1. Failing to do 'secure browsing', in other words not browsing the internet on a secure connection (https) when possible
2. Failing to receive 'login notifications' that warn them when it looks like someone else is trying to access one of their accounts
3. Failing to use malware or anti-virus software on their devices
4. Providing personal information over the phone to strangers
5. Keeping their location on their device(s) so that others know their whereabouts

6. Clicking unknown website links that have been sent to them
7. Allowing all their content (e.g., ‘posts’, ‘stories’, videos) to be shared with others
8. Allowing their e-mail address to be shared with others
9. Allowing their phone number to be shared with others
10. Allowing others to post or tag them in any content they share
11. Failing to review tags or posts of them that have been made by other people
12. Failing to keep a restricted list of ‘friends’ who can only see the information that they make public
13. Failing to block users so they can no longer see things that the other person posts, tag them in, invites them to events or groups, starts a conversation with them or adds them as a 'friend'
14. Sharing their audio and video in Zoom meetings with strangers
15. Allowing apps to track their activity when asked
16. Looking at erotic or pornographic pages

Appendix H

Parental Monitoring

When you were a child or adolescent (i.e., up until age 18) did your parent or guardian do the following (yes/no):

1. Have rules about time spent using any technology?
2. Stayed nearby while you were using any technology?
3. Watched your screen while you were using any technology?
4. Helped you use technology?
5. Talked to you about your technology use?
6. Sat with you while using technology?
7. Did not allow you to:
    a. Give out personal information through technology?
    b. Buy anything online?
    c. Fill out online forms/quizzes?
    d. Use e-mail?
    e. Use chat rooms?
    f. Use instant messaging?
    g. Play games on the internet?
    h. Download things?
8. Installed monitoring software on any technology?
9. Checked sites that you visited later?
10. Checked your emails or messages?
11. Blocked your use of any technology?

Appendix I

Digital Literacy

(Using a 5-point Likert scale ranging from *strongly agree* to *strongly disagree*):

Technological skill

1. I know how to bookmark a website I like so I can view it later.
2. I always know how to download/save a photo I found online.
3. I know how to download information I found online.
4. I always know how to connect to a Wi-Fi network, no matter the device or where I am.
5. I know how to use shortcut keys (e.g. CTRL + C o cmd + C for copy).
6. I do not like downloading apps for smartphones as I find difficult to learn how to use them (recoded).
7. If I want to install new programs on my computer, I will ask someone to do it for me because I do not know (recoded).

Personal security skill

1. I know how to deactivate the function showing my geographical position (e.g. Facebook, apps).
2. I know when I can post pictures and videos of other people online.
3. I know how to use 'report abuse' buttons on social media sites (e.g., someone uses my photo without my permission).
4. I know how to change the sharing settings of social media to choose what others can see about me (friends of friends, friends only, only me).

Critical skill

1. I know how to compare different sources to decide if information is true.
2. I know how to determine if the information I find online is reliable.
3. I know how to identify the author of the information and evaluate their reliability.
4. I know how to compare different apps in order to choose which one is most reliable and secure.
5. If I meet someone online, I know how to check if their profile is real.

Devices security skill

1. I use software to detect and remove viruses.
2. I know how to detect a virus in my digital device.
3. I know how to block unwanted or junk mail/spam.
4. If something doesn't work occurs while I am using a device (computer, smartphone, etc.), I usually know what it is and how to fix the problem.

Informational skill

1. I find hard to decide what the best keywords are for online searching (recoded).
2. I find confusing the way in which many websites are designed (recoded).

3. Sometimes I find difficult to determine how useful the information is for my purpose (recoded).
4. I get tired when looking for information online.
5. Sometimes I end up on websites without knowing how I got there.

Communication skill

1. Depending on who I want to communicate with, it is better to use one method over the other (make a call, send a WhatsApp message, send an email, etc.)
2. I know how to send any file to a contact using a smartphone.

Appendix J

Problematic Internet Use Questionnaire Short-Form

Instructions: In the following you will read statements about your Internet use. Please indicate on a scale from 1 to 5 how much these statements characterize you.

	never	rarely	some-times	often	always/ almost always
1. How often do you spend time online when you'd rather sleep?	1	2	3	4	5
2. How often do you feel tense, irritated, or stressed if you cannot use the Internet for as long as you want to?	1	2	3	4	5
3. How often does it happen to you that you wish to decrease the amount of time spent online but you do not succeed?	1	2	3	4	5
4. How often do you try to conceal the amount of time spent online?	1	2	3	4	5
5. How often do people in your life complain about spending too much time online?	1	2	3	4	5

6. How often does it happen to you that you feel depressed, distressed, or nervous when you are not on the Internet and these feelings stop once you are back online?	1	2	3	4	5

Note: Items belong to three subscales: Obsession (item 2 and 6), Neglect (item 1 and 5), Control disorder (item 3 and 4)

Appendix K

Popularity Demands Questions

1. If you have social media, what is the most followers that you have on any one platform?
    a. [number entry]
2. How many text messages do you typically receive in a day?
    a. [number entry]
3. How many emails do you typically receive in a day?
    a. [number entry]
4. How many phone calls do you receive in a day?
    a. [number entry]
5. If you play video games, how many online gamer friends do you have?
    a. [number entry]

Appendix L

Personality Research Form - Infrequency Scale (Jackson, 1984)

Read each statement and decide whether or not it describes you. If you agree with the statement or decide that it does describe you, answer TRUE. If you disagree with a statement or feel that it is not descriptive of you, answer FALSE. Answer every item either true or false, even if you are not completely sure of your answer.

0 = False; 1 = True

1. I have never bought anything in a store. _____
2. I could easily count from one to twenty-five. _____
3. I can run a mile (1.6 kilometres) in less than four minutes. _____
4. I have never talked to anyone by telephone. _____
5. I usually wear something warm when I go outside on a very cold day. _____
6. I make all my own clothes and shoes. _____
7. I have never brushed or cleaned my teeth. _____
8. Things with sugar in them usually taste sweet to me. _____
9. Sometimes I see cars near my home. _____
10. I have never had any hair on my head. _____
11. I have traveled away from my home town. _____
12. I have never ridden in an automobile. _____
13. I have never felt sad. _____
14. I try to get at least some sleep every night. _____
15. Sometimes I feel thirsty or hungry. _____
16. I have attended school at some time during my life. _____

Appendix M

Information Letter – Study 2

Dear Potential Participant:

Thank you for your interest in the "Tracking Distress and Experiences with Technology"" study. You have been invited to participate in this study so that we can better understand people's experiences on technological platforms.

Taking part in this study is voluntary. Before you decide whether you would like to take part in this study, please read this information carefully to understand what is involved. If you have any questions, please ask one of the research team members (see the contact information at the end of this letter).

PURPOSE

The main purpose of this study is to assess participants' use of technology and experiences on technological platforms, and how these may relate to psychological factors. In particular, we are interested in privacy concerns that some individuals might experience on these platforms.

WHAT INFORMATION WILL BE COLLECTED?

Information related to experiences in and outside of technology (e.g., technological issues experienced, interactions with others, daily activities) will be collected, as well as ratings of distress.

WHAT IS REQUESTED OF ME AS A PARTICIPANT?

There are three components of this study:

1) Participants will partake in a short survey
2) A subset of participants will be invited to fill out daily measures on the smartphone application for a span of three weeks
3) Participants will partake in a virtual debriefing survey

Each part of the study may be completed at a location of your choosing. It is anticipated that part 1 will last no longer than 30 minutes, part 2 no longer than 3 weeks, and part 3 no longer than 15 minutes, with only up to 1 hours' worth of total involvement.

WHAT ARE MY RIGHTS AS A PARTICIPANT?

You are under no obligation to participate and are free to withdraw at any time without prejudice to pre-existing entitlements. Your decision to participate will also not affect your academic status. You may also refuse to answer any question or questions while partaking in this study.

WHAT ARE THE RISKS AND BENEFITS?

There are no known physical risks associated with participating in the current study. However, some of the material in the questionnaires contains sensitive subject matter that might result in minor psychological discomfort for some people. If this occurs and you would like some extra support, you may contact Student Health and Wellness at Lakehead University. If you are at Thunder Bay campus, you may contact 1-807-343-8361, and if you are at Orillia campus, you may contact 1-705-330-4008 ext. 2116. For the Thunder Bay Crisis Response Service through the Canadian Mental Health Association you may also contact 1-807-346-8282, or for the Ontario Mental Health Helpline, please contact 1-866-531-2600.

As a token of our gratitude for participating in this research, you may elect to receive:

- a half bonus credit towards an eligible Lakehead University psychology course for completing the first short survey
- an additional half bonus credit per interval measure that you complete (up to 1.5 credits)
- an entry into a draw for a $25 electronic gift card to a location of your choosing out of Walmart, Amazon, or Tim Hortons for completing the entire study

If you elect to receive bonus marks, you must access this survey through the Sona system (http://lupsych.sona-systems.com). We ask that you provide your email address at the end of the study if you choose to receive an electronic gift card. This email will not be associated with your responses.

HOW WILL MY CONFIDENTIALITY BE MAINTAINED?

Your anonymity and confidentiality will be maintained throughout this study and the faculty research investigator (Dr. Dwight Mazmanian) will not know which students have participated in this study. All data will be coded with a number and no identifying information will be associated with responses or research results. Only Dr. Mazmanian (principal investigator), Casey Oliver (student investigator), Erika Puiras (student research team member), and Mica Shenin (student research team member) will have access to the anonymized data.

Please note, however, that the SEMA3 smartphone application used in this study is hosted on a server in Australia and is maintained by the Melbourne eResearch Group. Participants are identified only with a unique 9-digit numeric identifier, which is linked to their hashed (encrypted) emails to enable one-way mapping for the purpose of verifying whether a participant user has an existing SEMA3 user account when being invited into a new study. This means that

members of the eResearch Group have access to the raw data however, they do not use this data for any purpose. Furthermore, only the study personnel will have access to the unique identifiers. For more information about SEMA3 privacy visit here: https://sema3.com/privacy.html With your consent to participate in this study, you acknowledge this.

WHAT WILL MY DATA BE USED FOR?

The data obtained in this research will be used for the doctoral dissertation of the student investigator, Casey Oliver, and the findings will also be used for research publications and/or presentations at scholarly conferences. Your identity will remain anonymous throughout these processes.

WHERE WILL MY DATA BE STORED?

All raw data will be securely stored at Lakehead University for five years.

HOW CAN I RECEIVE A COPY OF THE RESEARCH RESULTS?

A summary of the results can be made available to you by email once the study has been completed. If you are interested in receiving these research results, please email the researcher at [coliver3@lakeheadu.ca] with the subject heading "Results Summary Request – Tracking Distress and Experiences with Technology". We will email you a copy of the Results Summary once it is made available which may take up to three years after you complete the study.

WHAT IF I WANT TO WITHDRAW FROM THE STUDY?

Your participation in this research is completely voluntary, and should you choose not to participate, you may do so without consequence or the need for justification. Similarly, you may also discontinue your participation at any time without explanation or penalty. However, once you submit your data it cannot be withdrawn due to its anonymity. If you wish to withdraw from the study, please contact the research at coliver3@lakeheadu.ca.

RESEARCH TEAM CONTACT INFORMATION:

If you have any further questions regarding this study, you may contact:

Casey Oliver, MA, Clinical Psychology Graduate Student: coliver3@lakeheadu.ca

Dwight Mazmanian, PhD, Professor, Department of Psychology: dmazmani@lakeheadu.ca

RESEARCH ETHICS BOARD REVIEW AND APPROVAL:

This research study has been reviewed and approved by the Lakehead University Research Ethics Board. If you have any questions related to the ethics of the research and would like to speak to someone outside of the research team, please contact Sue Wright at the Research Ethics Board at 807-343-8283 or research@lakeheadu.ca.

Thank you for your interest and participation. It is greatly appreciated!

Appendix N

Thank You and Debriefing Form – Study 2 – Short Survey Only Group

Thank you for your participation in this research project on technology. We hope that this study will provide information on young adults' mental health and their experiences on technological platforms. Past research has indicated that experiences, like unwanted sexual attention, are related to negative psychological outcomes. Hence, this research project hopes to expand information in this area by examining participants' social experiences on technological platforms, and their distress over time. This information can then be used to inform prevention and treatment strategies for perpetrators and victims of negative technological encounters.

Information about Study Results

A summary of the results can be made available to you by email once the study has been completed. If you are interested in receiving these research results, please email the researcher at [coliver3@lakeheadu.ca] with the subject heading "Results Summary Request - Tracking Distress and Experiences with Technology". We will email you a copy of the Results Summary once it is made available which may take up to three years after you complete the survey.

Bonus Credits

As a token of our gratitude for participating in this research, you may elect to receive a half bonus credit towards an eligible Lakehead University psychology course for completing the short survey. If you elect to receive bonus marks, you must access this survey through the Sona system (http://lupsych.sona-systems.com).

If you have specific questions about the survey you may contact the student investigator, Casey Oliver, M.A. [coliver3@lakeheadu.ca] or the principal investigator, Dwight Mazmanian, Ph.D., C.Psych [dmazmani@lakeheadu.ca, 807-343-8257].

If completing this study has raised any mental health concerns that you would like to discuss, you may contact Student Health and Wellness at Lakehead University. If you are at Thunder Bay campus, please contact 1-807-343-8361, and if you are at Orillia campus, please contact 1-705-330-4008 ext. 2116. For the Thunder Bay Crisis Response Service, you may also contact 1-807-346-8282 or for the Ontario Mental Health Helpline please contact 1-866-531-2600.

Please print or save a copy of this letter for your records.
With sincere thanks,
Casey Oliver and Dr. Dwight Mazmanian, Health, Hormones, & Behaviour Lab, Department of Psychology

Appendix O

Thank You and Debriefing Form – Study 2 – Full Study Group

Thank you for your participation in this research project on technology. We hope that this study will provide information on young adults' mental health and their experiences on technological platforms. Past research has indicated that experiences, like unwanted sexual attention, are related to negative psychological outcomes. Hence, this research project hopes to expand information in this area by examining participants' social experiences on technological platforms, and their distress over time. This information can then be used to inform prevention and treatment strategies for perpetrators and victims of negative technological encounters.

Information about Study Results
A summary of the results can be made available to you by email once the study has been completed. If you are interested in receiving these research results, please email the researcher at [coliver3@lakeheadu.ca] with the subject heading "Results Summary Request - Tracking Distress and Experiences with Technology". We will email you a copy of the Results Summary once it is made available which may take up to three years after you complete the survey.

Bonus Credits and Gift-Card Draw
As a token of our gratitude for participating in this research, you may elect to receive:

- a half bonus credit towards an eligible Lakehead University psychology course for completing the orientation
- an additional half bonus credit per interval measure that you complete (up to 1.5 credits)
- an entry into a draw for a $25 electronic gift card to a location of your choosing out of Walmart, Amazon, or Tim Hortons for completing the entire study

If you elect to receive bonus marks, you must access this survey through the Sona system (http://lupsych.sona-systems.com). We ask that you provide your email address at the end of the study if you choose to receive an electronic gift card. This email will not be associated with your responses.

If you have specific questions about the survey you may contact the student investigator, Casey Oliver, M.A. [coliver3@lakeheadu.ca] or the principal investigator, Dwight Mazmanian, Ph.D., C.Psych [dmazmani@lakeheadu.ca, 807-343-8257].

If completing this study has raised any mental health concerns that you would like to discuss, you may contact Student Health and Wellness at Lakehead University. If you are at Thunder Bay campus, please contact 1-807-343-8361, and if you are at Orillia campus, please contact 1-705-330-4008 ext. 2116. For the Thunder Bay Crisis Response Service, you may also contact 1-807-346-8282 or for the Ontario Mental Health Helpline please contact 1-866-531-2600.

Please print or save a copy of this letter for your records.
With sincere thanks,
Casey Oliver and Dr. Dwight Mazmanian, Health, Hormones, & Behaviour Lab, Department of Psychology

Appendix P

Protocol Check

1. Where will you download the SEMA3 Application?
    a. Through a website on my laptop
    b. Through the Appstore on my smartphone
2. How often will you fill out measures in this study?
    a. Whenever I am prompted to
    b. Whenever a certain event happens
    c. Both a & b
    d. I don't know
3. Where you successful in downloading the application?
    a. Yes
    b. No
4. Are you able to open the application?
    a. Yes
    b. No
5. Do you have any questions for the researcher?
    a. Yes
    b. No

Appendix Q

Technological Issues Measure

Have you experienced any of the following in the past two years?

1. Trouble downloading software
2. Time spent rebooting or refreshing device
3. Frozen application
4. Bad internet connection
5. Running out of room or space on a device
6. Encountered formatting issues in an application
7. Had trouble handing in homework or work through technology
8. Another type of device error

Appendix R

General Health Questionnaire (GHQ-12)

Have you recently?

1. Been able to concentrate on what you're doing?
2. Lost much sleep over worry?
3. Felt you were playing a useful part in things?
4. Felt capable of making decisions about things?
5. Felt constantly under strain?
6. Felt you couldn't overcome your difficulties?
7. Been able to enjoy your normal day-to-day activities?
8. Been able to face up to your problems?
9. Been feeling unhappy and depressed?
10. Been losing confidence in yourself?
11. Been thinking of yourself as a worthless person?
12. Been feeling reasonably happy, all things considered?

Appendix S

Additional TFSV Questions for EMA

9. Where did it happen?
    a. Social media/news (e.g., Facebook, Pinterest, Instagram)
    b. Dating applications (e.g., eHarmony, Grindr, Tinder)
    c. Video game platforms (personal computer, console, handheld)
    d. Chat applications (e.g., WhatsApp, WeChat, iMessage)
    e. Video conferencing applications (e.g., Zoom, Skype, FaceTime)
    f. Internet forums (e.g., Reddit)
    g. Blog websites
    h. Email
    i. Phone calling
    j. SMS text messaging
    k. Other (please specify)
10. Who did it?
    a. Strangers
    b. Friends (including online friends that you have not have met in-person)
    c. Family members
    d. Acquaintances (i.e., someone who you know but not on a personal level, not including school mates or work associates)
    e. Person I have been intimate with in conversation and/or physically, but would not consider a past or current partner (e.g., “friend with benefits”, “hookup buddy”, person who has been on a date(s) with you)
    f. Intimate partner(s)
        i. Past (i.e., when the incident happened they were no longer your intimate partner)
        ii. Current (i.e., when the incident happened they were your intimate partner)
    g. Work associates (e.g., colleagues, supervisors, managers)
    h. School mates (e.g., classmates, lab mates)
    i. Not applicable
    j. Other (please specify)

Appendix T

In-The-Moment EMA Questions

1. Have you used technology within the last 2 hours? [not including for this study]
    a. Yes
    b. No
2. If so, were you just using technology for any of the following? [not including for this study; select all that apply]
    a. Social Media/News (e.g., Instagram, Snapchat, Facebook, Twitter, TikTok, Pinterest, YouTube)
    b. Dating Applications (e.g., Bumble, eHarmony, Grindr, Hinge, Plenty of Fish, Tinder)
    c. Video Game Platforms (e.g., Xbox, PlayStation, Nintendo Switch, Personal computer games, Phone application games, social media games)
    d. Chat Applications (e.g., WeChat, WhatsApp, iMessage)
    e. Video Conferencing Applications (e.g., Facetime, Zoom, Skype)
    f. Internet forums (e.g., Reddit)
    g. Blog websites
    h. Email
    i. Phone calling
    j. SMS text messaging
    k. Other
    l. I was not using technology
3. If so, did you encounter any issues that are examined in this study while using it?
    a. Yes [re-route to event-contingent measures]
    b. No, but I experienced a different issue [text box provided]
    c. No
4. If so, and you were interacting with someone, who were you interacting with?
    a. Strangers
    b. Friends (including online friends that you have not have met in-person)
    c. Family members
    d. Acquaintances (i.e., someone who you know but not on a personal level, not including school mates or work associates)
    e. Person I have been intimate with in conversation and/or physically, but would not consider a past or current partner (e.g., “friend with benefits”, “hookup buddy”, person who has been on a date(s) with you)
    f. Intimate partner(s)
        i. Past (i.e., when the incident happened they were no longer your intimate partner)
        ii. Current (i.e., when the incident happened they were your intimate partner)
    g. Work associates (e.g., colleagues, supervisors, managers)
    h. School mates (e.g., classmates, lab mates)
    i. Other (please specify)
    j. I was not using technology nor was I interacting with anyone

Appendix U

Additional Technological Issues Questions for EMA

1. Where did it happen?
    a. Social media/news (e.g., Facebook, Pinterest, Instagram)
    b. Dating applications (e.g., eHarmony, Grindr, Tinder)
    c. Video game platforms (personal computer, console, handheld)
    d. Chat applications (e.g., WhatsApp, WeChat, iMessage)
    e. Video conferencing applications (e.g., Zoom, Skype, FaceTime)
    f. Internet forums (e.g., Reddit)
    g. Blog websites
    h. Email
    i. Phone calling
    j. SMS text messaging
    k. On a device in general (e.g., computer froze)
    l. Other (please specify)
2. Did anyone help you resolve it?
    a. Yes
        i. Stranger(s)
        ii. Friend(s) (including online friends that you have not have met in-person)
        iii. Family member(s)
        iv. Acquaintance(s) (i.e., someone who you know but not on a personal level, not including school mates or work associates)
        v. Person I have been intimate with in conversation and/or physically, but would not consider a past or current partner (e.g., “friend with benefits”, “hookup buddy”, person who has been on a date(s) with you)
        vi. Intimate partner(s)
            1. Past (i.e., when the incident happened they were no longer your intimate partner)
            2. Current (i.e., when the incident happened they were your intimate partner)
        vii. Work associate(s) (e.g., colleagues, supervisors, managers)
        viii. School mate(s) (e.g., classmates, lab mates)
    b. No
    c. Other (please specify)

Appendix V

International Positive and Negative Affect Scale – Short Form (I-PANAS-SF)

Thinking about yourself and how you feel right now, to what extent do you feel (scale of 0 to 6; 0 = not at all, 6 = extremely):

k. Upset
l. Hostile
m. Alert
n. Ashamed
o. Inspired
p. Nervous
q. Determined
r. Attentive
s. Afraid
t. Active

Appendix W

Information Letter– Study 3

Dear Potential Participant:

Thank you for your interest in the "Experiences with Sexual Violence through Technology" study. You have been invited to participate in this study so that we can better understand women's experiences with unwanted sexual attention on technological platforms.

Taking part in this study is voluntary. Before you decide whether you would like to take part in this study, please read this information carefully to understand what is involved. If you have any questions, please ask one of the research team members (see the contact information at the end of this letter).

PURPOSE

The main purpose of this study is to better understand the experiences of women with non-consensual sexual contact on technological platforms. In particular, we are interested in how the behaviour of women may change as a result of these experiences.

WHAT INFORMATION WILL BE COLLECTED?

In the present study participants will be asked some general questions, such as information about their use of technology. They will also be asked questions about their experiences with technology, including experiences involving unwanted sexual contact. Participants will further be asked questions about how their behaviour may have been affected by these experiences.

WHAT IS REQUESTED OF ME AS A PARTICIPANT?

The present study involves an online demographic survey that will be hosted on the SurveyMonkey platform (i.e., an online survey developer). This survey will not last longer than 10 minutes. Upon being invited to participate in this study, an interview will be scheduled one-on-one with the researcher at a date and time of your choosing. This interview will be conducted through the Zoom platform and will not take longer than 1 hour.

WHAT ARE MY RIGHTS AS A PARTICIPANT?

You are under no obligation to participate and are free to withdraw at any time without prejudice to pre-existing entitlements. Your decision to participate will also not affect your academic status. You may also refuse to answer any question or questions while partaking in this study.

WHAT ARE THE RISKS AND BENEFITS?

There are no known physical risks associated with participating in the current study. However, some of the material in the questionnaires contains sensitive subject matter that might result in minor psychological discomfort for some people. If this occurs and you would like some extra support, you may contact Student Health and Wellness at Lakehead University. If you are at Thunder Bay campus, you may contact 1-807-343-8361, and if you are at Orillia campus, you may contact 1-705-330-4008 ext. 2116. For the Thunder Bay Crisis Response Service through the Canadian Mental Health Association you may also contact 1-807-346-8282, or for the Ontario Mental Health Helpline, please contact 1-866-531-2600. For participants not in Thunder Bay or Ontario you may contact Crisis Services Canada at 1-833-456-4566. For Indigenous participants, you may also contact the Hope for Wellness Helpline at 1-855-242-3310.

As a token of our gratitude for participating in this research, you may elect to receive 1 bonus mark towards an eligible psychology course at Lakehead or receive a $25 (CAD) electronic gift cards from a place of your choosing out of Indigo, Tim Hortons, or Walmart. We ask that you provide your email address at the end of the study if you choose to receive an electronic gift card. This email will not be associated with your responses.

HOW WILL MY CONFIDENTIALITY BE MAINTAINED?

Your anonymity and confidentiality will be maintained throughout this study and the faculty research investigator (Dr. Dwight Mazmanian) will not know which students have participated in this study. All data will be coded with a number and no identifying information will be associated with responses or research results. Only Dr. Mazmanian (principal investigator), Casey Oliver (student investigator), Erika Puiras (student research team member), and Mica Shenin (student research team member) will have access to the anonymized data.

Please note, however, that the online survey tool used in the study (SurveyMonkey.com) is hosted by a server located in the USA. The US Patriot Act permits US law enforcement officials, for the purpose of anti-terrorism investigation, to seek a court order that allows access to the personal records of any person without the person's knowledge. In view of this we cannot absolutely guarantee the full confidentiality and anonymity of your data.

Furthermore, the research team cannot guarantee the full confidentiality and anonymity of your data with the use of the Zoom platform to conduct this study. With your consent to participate in this study, you acknowledge this.

WHAT WILL MY DATA BE USED FOR?

The data obtained in this research will be used for the doctoral dissertation of the student investigator, Casey Oliver, and the findings will also be used for research publications and/or

presentations at scholarly conferences. Your identity will remain anonymous throughout these processes.

WHERE WILL MY DATA BE STORED?

All data will be securely stored at Lakehead University for five years.

HOW CAN I RECEIVE A COPY OF THE RESEARCH RESULTS?

A summary of the results can be made available to you by email once the study has been completed. If you are interested in receiving these research results, please email the researcher at [coliver3@lakeheadu.ca] with the subject heading "Experiences with Sexual Violence through Technology". We will email you a copy of the Results Summary once it is made available which may take up to three years after you complete the survey.

WHAT IF I WANT TO WITHDRAW FROM THE STUDY?

Your participation in this research is completely voluntary, and should you choose not to participate, you may do so without consequence or the need for justification. Similarly, you may also discontinue your participation at any time without explanation or penalty. However, once you submit your data it cannot be withdrawn due to its anonymity.

RESEARCH TEAM CONTACT INFORMATION:

If you have any further questions regarding this study, you may contact:

Casey Oliver, MA, Clinical Psychology Graduate Student: coliver3@lakeheadu.ca

Dwight Mazmanian, PhD, Professor, Department of Psychology: dmazmani@lakeheadu.ca

RESEARCH ETHICS BOARD REVIEW AND APPROVAL:

This research study has been reviewed and approved by the Lakehead University Research Ethics Board. If you have any questions related to the ethics of the research and would like to speak to someone outside of the research team, please contact Sue Wright at the Research Ethics Board at 807-343-8283 or research@lakeheadu.ca.

Thank you for your interest and participation. It is greatly appreciated!

Appendix X

Thank You and Debriefing Form – Study 3

Thank you for your participation in this research project on sexual violence through technology. We hope that this study will provide information on young womens' experiences with unwanted sexual attention through technology. Past research has indicated that experiences, like unwanted sexual attention in-person, tend to cause women to engage in risk avoidance strategies (i.e., strategies that help to promote their safety). However, there may be both benefits and consequences to using such strategies. Hence, this research hopes to expand information in this area by examining participants' experiences on technological platforms and how they cope in the aftermath. This information can then be used to inform prevention and treatment strategies for perpetrators and victims of negative technological encounters.

Information about Study Results
A summary of the results can be made available to you by email once the study has been completed. If you are interested in receiving these research results, please email the researcher at [coliver3@lakeheadu.ca] with the subject heading "Results Summary Request - Experiences with Sexual Violence through Technology". We will email you a copy of the Results Summary once it is made available which may take up to three years after you complete the survey.

Bonus Credit or Gift Card
As a token of our gratitude for participating in this research, you may elect to receive 1 bonus credit on Sona to be used towards an eligible Lakehead University psychology course. If you elect to receive this credit, you must have signed up for this survey through the Sona system and your course instructor must allow for bonus marks. Once the survey has been completed, you will be granted the credits.

You may instead elect to receive a $25 (CAD) electronic gift cards from a place of your choosing out of Indigo, Tim Hortons, or Walmart. We ask that you provide your email address at the end of the study to the student investigator so that you can sent the gift card. This email will not be associated with your responses.
If you have specific questions about the survey you may contact the student investigator, Casey Oliver, M.A. [coliver3@lakeheadu.ca] or the principal investigator, Dwight Mazmanian, Ph.D., C.Psych [dmazmani@lakeheadu.ca, 807-343-8257].

If completing this study has raised any mental health concerns that you would like to discuss, you may contact Student Health and Wellness at Lakehead University. If you are at Thunder Bay campus, please contact 1-807-343-8361, and if you are at Orillia campus, please contact 1-705-330-4008 ext. 2116. For the Thunder Bay Crisis Response Service, you may also contact 1-807-346-8282 or for the Ontario Mental Health Helpline please contact 1-866-531-2600.

Please print or save a copy of this letter for your records.

With sincere thanks,
Casey Oliver and Dr. Dwight Mazmanian, Health, Hormones, & Behaviour Lab, Department of Psychology

Appendix Y

Semi-Structured Interview Guide

1. Tell me about how you use technology in your daily life
2. How would you describe your frequency of technology use and the types of devices and platforms that you use?
3. How would you describe your overall relationship with technology?
4. If you've had any, what types of negative experiences have you had with others through technology?
5. Would you be open to telling me about your experiences with receiving unwanted sexual behaviours through technology? For ease, here are some examples (*show example behaviours document to participant*)
6. How have these experiences affected you?
    a. Have these experiences changed how you interact with technology?
        i. Why or why not?
        ii. If yes, how so?
7. How have you dealt with these experiences?
    a. In response to these experiences, do you now promote your safety regarding unwanted sexual behaviours while using technology?
        i. If so:
            1. Are there any risks or consequences of doing these things?
            2. Are there any benefits of doing these things?
            3. What has been the outcomes of doing these?
            4. Any change in your engagement in school, employment, relationships or otherwise?
8. What supports would you like to see be put into place for these experiences?
9. Is there any other information that you would like to share about TFSV?
10. If you could choose one key, take-home message about TFSV that you would like the public/researchers to take from this study, what would it be?